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A PHYSICAL HISTORY OF THE U.S. MUSKET FACTORY PLANT, 1794 to 1885 U.S. ARMORY AT HARPER'S FERRY, VIRGINIA

VOLUME I - 1794 to 1841

ESTABLISHMENT, CONSTRUCTION, AND DEVELOPMENT OF THE U.S. MUSKET FACTORY

Harpers Ferry National Historical Park,
West Virginia

by

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315 pp.
9 maps.
2 illustrations.

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PREFACE:

The purpose of this study is to make available all known documentary evidence relating to the physical history of the U.S. Musket Factory buildings and grounds along the Potomac River in order to facilitate archeological investigation, accurate restoration, and interpretation of site at such time as it is included as a part of Harpers Ferry National Historical Site.

The U.S. Musket Factory site is an historic site of the first order of significance because its major and direct association with the John Brown Raid of October 1859.

In this volume the data first presented in Charles W. Snell' ("A History of the Physical Plant of the U.S. Armory at Harper's Ferry, Virginia, 1794-1884, Part I, 1794 - 1841,"(NPS typescript, August 1980) relating to the history of the U.S. Musket Factory has been expanded, ammended and revised in many instances,on the basis of a detailed restudy of the evidence relating the Musket Factory phase of the subject.

The writer wishes to acknowledge his endebtedness to the historical research : studies produced by National Park Service Historians Herbert L. Kissling and Arthur L. Sullivan during the years 1957 to 1961 (see Biblography, page 285 for their reports), and also to thank Park Librarian Hilda E. Staubs of the Harpers Ferry National Historical Park staff for cheerful and important assistance is providing copies of many documents and maps used in this report.

Charles W. Snell
Washington, D.C.
July 8, 1981

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CHAPTER I
OWNERSHIP OF THE LAND AND ESTABLISHMENT OF THE ARMORY, 1751-1797

1. Ownership of the Land, 1751 - 1797

The land that was to form the future site of the United States Armory at Harpers Ferry, Virginia, in 1796-97, was originally owned by Robert Harper, under two patents made to him from Lord Thomas Fairfax, proprietor of the " Northern Neck" of Virginia: one dated April 25, 1751 for 125 acres, and the second, dated April 19, 1762, for 92 acres.[1] Robert Harper, a millwright from Pennsylvania, resided at and improved his wilderness property at Harpers Ferry from 1751 until his death in October 1782. He constructed and operated a saw mill and flour mill, both situated on the Hall Islands, during these years and his residence was also located on the main land, but fronting on the Upper Hall Island .

Under his will, Harper bequeathed the western half, including his residence and flour and saw mills on the Shenandoah River, to his nephew Robert Griffith. The eastern half, which included his new stone tavern and his ferry rights on the Potomac River, Harper left to his niece, Sarah Harper, who was the wife of John Wager, Sr.[2] On January 9, 1797, Robert Griffith's son and heir sold the land including the Upper and Lower Hall Islands to Thomas Rutherford, William Darke Van Rutherford, and Mary Rutherford.[3]

1. Lord Fairfax's deed to Robert Harper of April 25, 1751, is in the Northern Grants Books, Book No. 6, p. 496, for 125 acres, in Virginia State Library, Richmond, Va. Data on the 2nd deed for 92 acres, dated April 19, 1796, from the recital of facts regarding the chain of ownership in Thomas Rutherford and others deed of B. & S., dated February 20,1797, to the United States Government, in National Archives, Washington, D.C.,Record Group 121, Public Buildings Service, Entry 75, Warranty Deeds and Correspondence, Harpers Ferry, W. Va., 1797-1880, Tray No. 1.

2.Last Will of Robert Harper of Berkeley County, Va., dated September 26,1782, probated October 15,1782, in National Archives Record Group 153, Military Reservati Division, Box No. 44- has copy of Harper's will.

3. Deed of Rutherford & Others to U.S. February 20,1797,National Archives R.G.121.

2. Establishment of the Armory and Acquisition of Land. 1794- 1797:

On April 2, 1794, President George Washington approved "An Act to provide for the erecting and repairing of Arsenals and Magazines, and other purposes."[1] This law directed the President to establish three or four arsenals for the storage of arms and also three or four national armories to manufacture small arms.[2] Acting under this authority, President Washington selected Harpers Ferry, Virginia, as the site of one of the new U.S. Armories and Arsenals, and directed to the War Department to purchase land at the junction of the Potomac and Shenandoah Rivers for this purpose.[3]

The 428 acres comprising the future site of the Armory and Arsenal was purchased from two parties for a total $ 17,016.66 in 1796 and 1797: On June 15,1796, John Wager, Jr. and his family conveyed about 117½ acres to the United States for $ 7,016.66 ;[4] on February 20,1797, Thomas Rutherford, William Darke Van Rutherford, and Mary Rutherford sold approximately 310½ acres to the United States for $ 10,000.[5] This acquisition included the 72-acre site of the U.S. Musket Factory on the Potomac, the chief arms manufacturing plant, Arsenal Square, the arms storage area which embraced about one acre and was located on the bank of the Shenandoah near the junction of the Potomac and Shenandoah River, and the 13 acre site of John H. Hall and U.S. Rifle Factory, situated on the Upper and Lower Hall Islands in the Shenandoah, where the Hall Patent rifle was to be manufactured from 1819 to 1844.

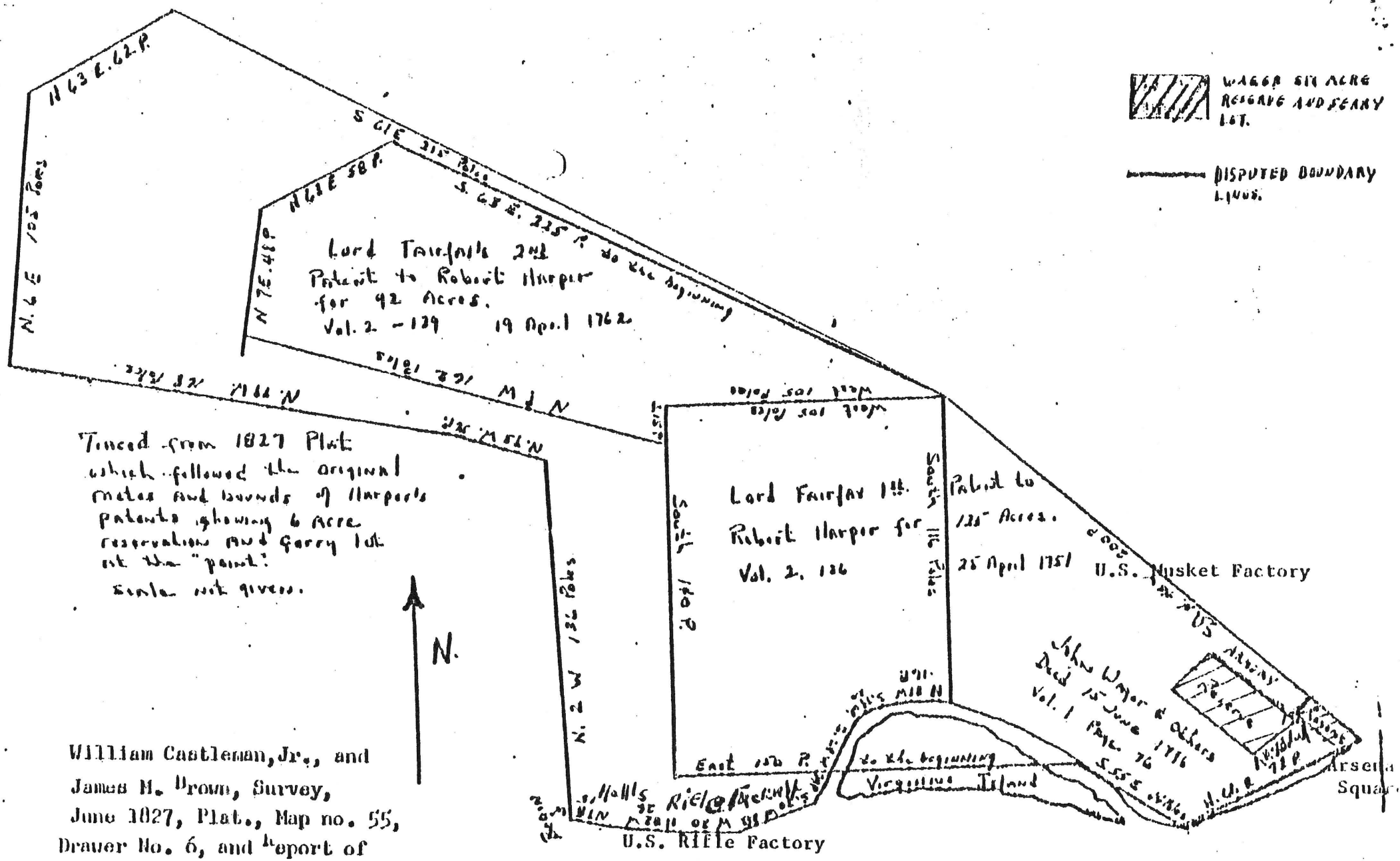
1. U.S. Statutes at Large, Vol. I, p.352.
2. Ibid.
3. For this involved story see, Snell, Charles W.,"A History of the Physical Plant of the U.S. Armory at Harper's Ferry, Virginia, Its Evolution and Development, Harpers Ferry National Historical Park, West Virginia,Volume I, (1794-1841)(N.P.S. Typescript, National Capital Team, Denver Service Center, August 1980), Vol. I, Chapter II.
4. Deed in National Archives Record Group No. 121, Public Buildings Service, Entry No. 75, Warranty Deeds and Correspondence, 1796-1884,for Public Lands at Harpers Ferry, W.Va.
5. Deed in National Archives Record Group 121. Entry 75. Washington. D.C.

Map No. 1

William Castleman, Jr. and James M. Brown's Survey of the U.S. Armory public lands at Harpers Ferry, Va., June 1827.

Plotting the boundaries of the 1796-97 deeds.

This map and survey was made to settle the dispute between the heirs of John Wager, Jr. and the U.S. Armory over the location of the boundary line between the Wager Six Acre Reservation and the south bank of the U.S. Musket Factory Canal.



Traced from 1827 Plat which followed the original metes and bounds of Harper's patents showing 6 Acre reservation and Ferry lot at the "point". Scale not given.

William Castleman, Jr., and James M. Brown, Survey, June 1827, Plat., Map no. 55, Drawer No. 6, and Report of Surveyor Castleman, National Archives.

CHAPTER II

Construction of the Armory, 1798-1802

Joseph Perkin, the first Superintendent of the U.S. Armory at Harper's Ferry, had been born in England, where he learned his trade as a gun smith. He came to America about 1774 and during the War for Independence worked at the Rappahannock Forge near Falmouth, Va. manufacturing arms. In 1781 he moved to Philadelphia where he openned his gun shop, also serving as a part-time inspector for the Intendent of Military Stores. From 1792 to 1798 he served as Superintendent of the Federal depot of Continental military stores, left over from the Revolution, at New London, Campbell County, Va. When the U.S. Government closed this installation in 1798, Secretary of War James McHenry transferred Perkin to Harper's Ferry on August 6, 1798.[1]

In a letter of instruction to Perkin, dated August 6, 1798, McHenry ordered the newly appointed superintendent to Harper's Ferry to conduct a preliminary survey of the " Waters and grounds for erecting the necessary buildings and works for the establishment of an Armoury." The Secretary also sent James Brindley, a noted English-born engineer, to accompany Perkin and to make the survey. Brindley had come to America in 1786 to oversee the construction of an inland waterway connecting the Schuylkill and Susquehanna

1. These and further details on Joseph Perkins are to be found in Smith, Merritt Roe, Harpers Ferry Armory and the New Technology- The Challenge of Change (Cornell University Press, Ithaca and London, 1977), p. 37-38.

Rivers in Pennsylvania. Since his arrival he had also superintended several other river development projects. He had visited Harper's Ferry in 1786 as a consultant for the Potownack Company and had at that time impressed Washington with his knowledge of canal navigation.[2]

Brindley and Perkins arrived at Harper's Ferry in mid-August 1798 and spent about two weeks examining sites on both the Potomac and Shenandoah Rivers. They decided that the best site for the proposed Armory or U.S. Musket Factory would be on the banks of the Potomac. Having completed their survey, the two men returned to Philadelphia, where they prepared a report with their recommendations and estimates of the cost that was presented to Secretary of War McHenry in September 1798.

On August 30, 1798 Secretary of War McHenry appointed John Mackey to be Paymaster and Storekeeper of the U.S. Armory at Harper's Ferry. Other than his foreign birth, outspoken Federalism, and friendship with McHenry, little is known about Mackey's life prior to 1798. He probably had served in some position under Samuel Hodgdon, the Intendent General of Military Stores in Philaldephia prior to his appointment to Harper's Ferry. Well-educated, Mackey had not quite succeeded in becoming a well-to-do gentleman. To his superiors, he was hard working, loyal, and ingratiating. To friends he was gracious and urbane. To his subordinates he was arrogant, ill-tempered, and over bearing. Of the two chief officers of the Harpers's Ferry Armory, Perkins and Mackey, Mackey was to be the the dominant figure and the two men came to hate each other.[3]

In practice, Mackey was to take charge of the construction of the Armory at

2. GAO Record Group 217-Account' Office, War Department, Letter Book G'; Smith, Harpers Ferry Armory, 38-39. Daniel H. Calhoun, The American Civil Engineer(Cambridge, Massachusetts, M.I.T. Press, 1960),pp.11-12; Bacon-Foster, Corra,"Early Chapters in the Development of the Potomac Route to the West," Records of the Columbia Historical Society,Vol. 15 (1912),167-169.

3. See Smith, Harpers Ferry Armory, 37-38, for further details on Mackey's character.

at Harper's Ferry, while Perkin's authority was limited to the repair and manufacture of arms.

Mackey arrived at Harper's Ferry on September 12,1798,eager to proceed with the new project. He had no instructions from the Secretary of War,however, and he also found that the new Superintendent, Perkins, had returned to Philadelphia. Nothing, if not resourceful, Mackey proceeded to develop his own plan for the new Armory, at least for the immediate future and on September 17, he informed Intendent General Samuel Hodgdon that the 100 foot long frame warehouse (bldg. No.11 on map No. [3]),which Col. Tobias Lear had purchased from John Wager,Sr., on June 15,1796 for $ 350, and which stood at the eastern end of the proposed musket factory site, adjacent to the Wager Ferry Lot, was being converted into a temporary " "Armory" or factory where Superintendent Perkin and his armorers could work on weapons until the permanent structures were erected. Mackey estimated that this conversion would be done in three weeks. He also planned to erect a barracks for the armorers and other workmen to live in, as little or no housing was available in the tiny town of Harper's Ferry. Finally, he recommended that a second new frame structure be erected as a temporary arsenal or place to store arms, as there was no existing structure that could be used for this purpose.[4]

In his report of September 25, Mackey reported rapid progress: the walls of the barracks or living quarters were going up and he estimated the structure would be finished in another 10 days,if the weather cooperated. He had also assembled all the material to complete the new roof and to finish

4. Records of the Adjutant General's Office,National Archives Record Group 94, Hodgdon-Mackey Papers, in Harpers Ferry National Historical Park Photostatic Collection, Document No. 102, No. 1- hereafter refered to to as HF- 102,No.1.

the necessary alterations to the interior of the frame warehouse. He estimated that the temporary armory would be ready for use in 10 days. He mentioned that the additional tools that he had ordered from Philadelphia had not yet arrived.[5]

Superintendent Joseph Perkins returned to Harpers Ferry in October 1798, bringing with him some 10 armorers who had formerly worked at New London, Virginia. These men went to work in the temporary Armory, - the frame warehouse, reconditioning damaged arms shipped from depots in Carlisle, Philadelphia, and New London. Other than assisting an artillery officer named Major Louis Tousard conduct experiments with local iron ores for casting cannon, there was little for Perkins to do other than supervising the repair of small arms, and interviewing propective suppliers of the raw material that would be needed once the manufacture of small arms got underway.[6]

Construction was suspended with the coming of the winter of 1798-99, and the War Department accounts indicate that a total of $ 3,028.53 was expended in 1798 to convert the warehouse to an armory and to erect a barracks for the workmen.[7]

On February 21,1799, Paymaster Mackey wrote a letter to Intendent General Samuel Hodgdson that indicates that the Adams administration had as yet failed to formulate a firm plan of what was to be done at Harper's Ferry. Mackey posed 11 "Subjects relative to the Business at Harpers Ferry on which the decision of the Secretary of War is solicited:

5. HF-102- No. 2.
6. Smith, Harper Ferry Armory, p.40.
7. American State Papers, Military Affairs, II, p. 481.

"1. What are the Buildings that may be erected?

2. The scales(sizes of the buildings) can only be determined by fixing the number of Mechanics that may fill the Establishment.

3. What may be the site of the Buildings? This must be determined by the course of the Canal(which had not yet be fixed).

4. By what route may the Iron(needed to manufacture muskets) be transported(through a wilderness without roads) to Harpers Ferry?

5. Gunstocks- how many may be purchased of Ab[raha]m Shephard? *

6. Saw mill(what to do with the old saw mill that had been erected by Robert Harper prior to 1782 on the Lower Hall Island-keep it or build a new one?).

7. Millwright(one probably needed to install waterwheels)?

8. Burning Bricks (which would be needed to erect the permanent Armory buildings).

9. Shall the providing of rations & materials(to the workmen) remain with the paymaster solely? When many Agents are employed to procure the same materials, and each acting without the advice or Knowledge of the others, loss & confusion must be the consequence- An instance of this occurrs in the Gun stock business.

10. The Secretary of War is requested to Sanction those occassional expenses which must be incurred by the Paymaster when he rides abroad to purchase materials &C.

11. What are to be the accommodations of the Superintendent of Armorerers(sic) - is the rent of the house which he occupies (apparently rented from the Wagers) to be paid by the Government? and may a small Dwelling house be built for his use.

8

8. HF- Document 102-No. 3.

* Col. Abraham Shepherd had commanded the 10th North Carolina Continental Regiment in 1777-78, during the War for Independence. He now lived at Shepherdstown, Va.

These basic questions were apparently resolved by the Secretary of War between February 21 and March 12, 1799.

Mackey planned to design all of the buildings himself and felt no need for the services of an architect. As he envisioned the canal or raceway that was to provide the water to turn the Armory water wheels "to be nothing more then a common Water course of about 15 feet wide and 3 feet deep," he saw no reason to hire the services of a professional canal builder to supervise this work- this would just be a waste of the public money, as he could do this task. Mackay, however, was willing to have the engineer James Brindley come and lay out the course of the proposed canal and also to plan and construct the dam on the Potomac which would divert water into the Armory canal. In his letter of March 12,1799 to the Intendent General, The Paymaster thus wrote:

"In my former letters I have urged the necessity of sending Mr. Brindley forward. Let me beg to obtrude once more my earnest request on you that nothing be left untried to have him on the ground about the 21st inst.

All the materials for the building have been secured by contracts. Carpenters, Brickburners, Bricklayers are engaged - in a word every thing preparative to our operations is done, but the beginning cannot be made until the course of the Canal be accurately marked, for by this the site of the buildings is to be determined..." 9

Due to prior commitments in the East, Brindley did not reach Harper's Ferry until April 28, about one month later than hoped for. Once there, however, the engineer completed his survey quickly, staking out the limits of the Armory canal within ten days and then returning to Philadelphia.

9. HF-Documents 102-No. 9.

Mackey probably began the construction of permanent Armory brick buildings on May 6, 1799, the day the Brindley completed marking out the line and site of the proposed Musket Factory Canal.

Two months later, on July 10, Paymaster Mackey boasted,

> "We have at this time finished fully ½ of the Canal, and shall prosecute the Business with our utmost application & abilities to its final completion, which, we hope, it will be in our power to announce about the 1st of November next;

He noted however, "at this time we cannot muster above 39 Men (to work on the canal), it being harvest season. If we should be able to command 150 men for three months, there can be no doubt of our success."

But the canal was proving to be a much larger construction project that Mackey had bargined for. The Paymaster commented: "The Bank (of the canal) in some parts is 27 to 38 feet wide at the base & 9 at the top, and from 9 to 13 feet high -- nothing like this was contemplated (See Mackey's letter of March 12,1799). Nevertheless I hope the estimate (of funds) will be equal to the whole."

Turning to the progress of construction on the brick buildings, Mackey reported: "The (Smiths) Shop is built, the Mill House and Factory half built, and the materials for the arsenal nearly in readiness. Everything goes on well." [10]

On August 9,1799, engineer James Brindley returned to Harpers Ferry and with a small work crew begain the construction of a partial masonry dam on the Potomac. After 64 days of work, he left Harpers Ferry on October 22, 1799, and returned to Philadelphia. The dam was not complete and could not be finished because the Armory canal was not yet ready to receive water. [11]

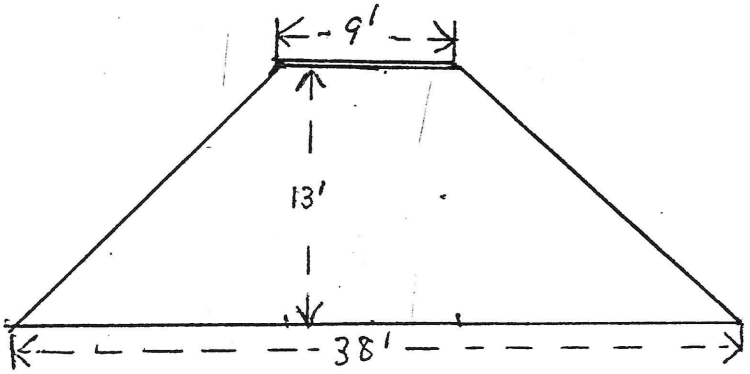
10. HF-Document 102, No. 11. Mackey to Hodgdon, July 10,1799.

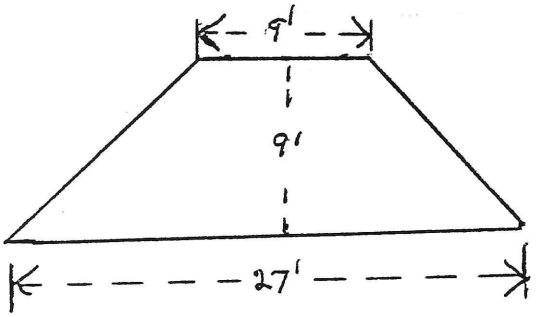
11. Simmons to Perkin, June 1,1799, Letter Book F, First Auditor's Accounts; Accountant's Office, War Department, Letter Book G., Records of U.S. General Accounting Office, Record Group 217. Smith, Harpers Ferry Armory, 41-42.

Harpers Ferry Armory

Plans of the Banks of the Musket Factory Canal

Dec. 1799





C. W. Snell 6/81

Six months later, on December 26, 1799, Paymaster Mackey triumphantly reported the progress on the construction of four Armory large brick structures, writing to Intendent General Samuel Hodgdon:

> The Smith shop and Factory are finished. The Arsenal is built but not entirely finished. Two upper floors are yet to be laid. All, even my numerous Democratic Enemies, agree that the Buildings are elegant.
>
> The Smith Shop is 80 by 26 ft. clear of the walls; The Factory 120 by 26 feet, and the Arsenal 120 by 27 feet within. The [smith] shop contains 10 forges, one of which is designed for a Tilt-hammer; The ground floor of the factory is designed for the boring, grinding & polishing machinery; the filers and stockers will occupy the upper floor. The Garret will receive Gun Stocks lumber etc. The Mill is almost built, but will not be put together until the Water is in the Canal. The Arsenal has three floors. This building stands within the confluence of [the Potomac and Shenandoah] Rivers.

At the same time, however, Mackey was forced to concede that the progress of work on the new canal and dam was far behind schedule. He reported in regards to these problems:

> "The Bank & Walls of the Canal on the land, ½ mile in length are nearly done, but 3/4 of the whole is yet to be puddled. A third of the dam is done. 100 men in 3 months will complete the Whole. Mr. Brindley has made many mistakes in his part of the business -they are stated in my report to the Secretary [of War]. If I should continue here (which is very doubtful) I shall renew our operations early in the Spring, so that we may have the business done about the middle of July [1800]..." [12]

A total of $ 14,565.00 had been expended on the construction of the Armory buildings, canal, and dam during 1799.[13]

The evidence suggests that from the start Paymaster Mackey had greatly underestimated the degree of difficulty and the amount of labor that would be required to construct the large Armory canal. To add to these problems, he had contracted with three unqualified men, all Federalists no doubt, to construct the canal. They included Col. Abraham Shepherd, a distinguished Revolutionary officer from North Carolina, now a well-to do business man, community leader at Shepherdstown, Va., and a staunch Federalist, as the superintendent of construction. Because of his advanced age and frail health, Shepherd was able to make only

12. HF-Doucment No. 102- No.14.
13. American State Papers, Military Affairs, Vol. II, p.481.

occasional visits to inspect the progress of construction on the canal. To do the actual supervision of the construction, Mackey employed Robert Whittel, a local dry goods merchant. Whittel, who like Col. Shepherd knew nothing about canal construction, was assisted by John Tully as on-the-job foreman. Tully may have once worked as a laborer on the Potomac Canal, but he was not trained in the technics of heavy construction that were required to build the large Armory canal.[14]

Another problem was finding an adequate supply of reliable workers who were willing to perform the back-breaking work in a hot, humid, and muddy ditch that was required to excavate the canal. The removal of large quantities of rock was probably also necessary and this type of work had not been included in the original estimates. Of the shortage of men Paymaster Mackey had reported on July 14, 1799:

" We have not been able to muster more than 50 labourers on an average since the Canal was commenced. We use every means in our power to allure (sic) them to ... but such is the habitual laziness of the poor of this country that nothing but absolute want can drive them from home...[15]

Slave owners also refused to rent their slaves to perform this heavy labor because they considered their blacks too valuable to risk damage by putting them to such heavy work. Thus while good progress had been made in erecting the buildings in 1799, the construction of the canal and dam were far behind schedule.

14. HF- Document 103, No. 1 and 2, May 2,1799. Accountant Office, War Department Letter Book G, National Archives Record Group 217, M.R. Smith's Harpers Ferry Armory, pp.42-43.
15. HF- Document No. 103, No.3.

By January 1800, Paymaster John Mackey faced many difficulties, most of which were of his own making. He had caused a strike among his workmen, created political squables, offended President George Washington with regards to his supplying the three regiments of the U.S. Provisional Army that camped on Camp Hill during the winter of 1799-1800, and was also feuding with William Simmons, the War Department accountant. Seeing the handwriting on the wall, Mackey resigned as Paymaster in January 1800, pleading ill health, and he left Harpers Ferry in April 1800.[16]

On April 22,1800, Secretary of War James McHenry appointed Samuel Annin, of New Jersey and a former soldier in the Continental Army, to be the new Paymaster of the U.S. Armory at Harper's Ferry. Like Mackey, Annin was to have charge "of the Stores, together with the Superintendence of the erection of all the buildings, Dams & other business" at the armory.

Arriving at Harper's Ferry on May 1, Annin at once took charge of the construction program. The two brick buildings, the Armory mill and the Arsenal, were completed during the fall of 1800, as Annin first pushed work on the unfinished Armory canal.

The Secretary of War"s letter of instructions gave Annin the authority to continue Col. Arbraham Shepherd as the contractor in charge of construction if the Paymaster so desired. In reviewing Col. Shepnerd's accounts, however, Annin discovered that Shepnerd had defrauded the Armory of $ 185 by falisifying pay vouchers for 37

16. See M.R. Smith, Harpers Ferry Armory, pp.46-48 for details and many examples.

days work on the canal during the summer of 1799. Shepherd was discharged at once and forced to make restitution. Annin, unable to find a suitable person to take charge, was thus forced to assume personal supervision of the canal. [17]

Unable to secure the laborers necessary to dig the canal, Annin applied to Secretary McHenry for permission to employ soldiers of the three regiments under the command of Major General Charles C. Pinckney, who were still in their winter encampment on Camp Hill. McHenry applied for permission to hire the troops to President John Adams, who issued the desired order on May 22,1800.

In his orders to the troops, General Pinckeny announced:

> The President has directed that as many soldiers shall be employed on the Canal in the Vicinity of the camp as the good of the service will permit. The Major General has conversed with the superintendent of the works on this business and the superintendent is desirous of commencing next week with 50 soldiers as fatigue men and a proportionate number of sergeants. They will be allowed a Sixth of a Dolar per day and double rations of provisions per man. This is to be a weekly fatigue agreeably to the strength of the Different Regiments. Volunteers are to be preferred for this duty. [18]

17. Smith, Harpers Ferry Armory, 48-49. Simmons to Annin, May 14, 1800, July 24, 1800, June 1, 1801 Letter Book G, Record of the U.S. General Accounting Office, Record Group 217; Annin to William Eustis, June 10, 1810, Letters Received Records of the Office of the Secretary of War, National Archives Record Group 107; Supt. James Stubblefield to Col. George Bomford, October 5, 1822, Letter Received, Records of the Office of the Chief of Ordnance, Record Group No. 156. Henry Dearborn to Annin, May 11, 1801, OSW, Record Group 107, Miscellaneous Letters Sent.

18. Steiner, the Life and Correspondence of James McHenry, p. 424. Orderly Book Division Orders, May 22, 29, 1800. Record of the Office of the Judge Advocate General, National Archives Record Group No. 153.

By June 1, this work force had been increased to 100 men and was making rapid progress in puddling and banking the canal. On June 14,1800, however, the provisional army was disbanded and Annin lost his large work force . Forced to rely on private labor again, the construction of the canal and dam continued during the work seasion of 1800 and into 1801.

In 1800 $19,552.33 was spent for new construction; as only two brick buildings, largely finished in 1799, were completed in 1800, most of this money must have been spent for building the canal and Potomac dam. In 1801, when the canal was finally finished, the total spent for new construction amounted to only $ 6,558.20. During this two year period the first moneys were also spent for repair of buildings, dams, and canals: $ 505.81 in 1800 and $ 728.69 in 1801.[19]

Thus in May 1801, with the Armory canal finally operative, and seven years after the Act of April 2,1794, the Nation's second National Armory began the production of muskets at Harper's Ferry. About 28 armorers, working under the supervision of Superintendent Joseph Perkin, were able to make 293 flintlock muskets in 1801.[20]

As soon as water was let into the Armory Canal, however, there was trouble. On August 4,1801, the Acting Secretary of War notified Annin that Superintendent Perkin had reported "that the works at Harpers Ferry are much impeded in their progress by the leakings of the Canal and that proper attention to a remedy is not paid."[21]

19. American State Papers, Military Affairs, Vol. II, p. 481.
20. Ibid., II, p.481 for cost of construction and number of arms produced in 1801. ASP-MA, Vol. V, p.915 for the approximate number of armorers employed in 1801.
21. HF NHP Microfilm Reel 18, Vol. 1, p.21.

Much of the money spent for repairs during the next few years probably went to make the canal watertight. New construction fund expenditures, which were not large until 1806-07, were probably used to erect dwelling houses and storage buildings.

The total cost of constructing 20 buildings, one dam and the Potomac canal at the Harper's Ferry Armory, from 1798 to 1801, was $ 43,704.06. The total amount spent during this same period for repairs came to $ 1,234.50, thus making a grand total of $ 44,938.56 spent for construction and repair, 1798-1801. With the $ 17,016.66 spent to purchase the 428½ acres of land for the armory site included, the grand total cost of establishing and constructing the Harper's Ferry Armory from 1796 to December 31,1801 was $ 61,955.22.[22]

EXPENDITURES FOR CONSTRUCTION AND REPAIR, 1798 -1801

YEAR	Construction	Repair	Total
1798	$ 3,028.53	0	$ 3,028.53
1799	14,565.00	0	14,565.00
1800	19,552.33	505.81	20,058.14
1801	6,558.20	728.69	7,286.89
Total:	$ 43,704.06	1,234.50	44,938.56

Summary, Construction, 1799 - 1801:

In summary then, the course of the U.S. Musket Factory Canal on the Potomac was laid out by the English engineer James Brindley, April 28-May 6, 1799. Paymaster John Mackey gave the contract for constructing the canal to Col. Abraham Shepherd of Shephertown, Va. and work probably started in May 1799. Due to shortage of labor, the inexperience of the contractor, and the large scale of the project, progress was slow and by December 26,1799 Mackey was able to report that only about one-fourth a mile of the banks and walls of the canal had been finished.

22. American State Papers, MA, II, p.481.

Paymaster Jospeh Annin, replacing Mackey in that office, arrived at Harpers Ferry on May 1,1800. Discovering that Col. Shepherd had billed the Armory for work never done, Annin discharged the contractor and unable to find a suitable replacement, was forced to supervise the construction of the canal himself. From May 22 to June 14,1800, Annin was able to employ up to 100 men, soldiers from the three regiments of the U.S. Provisional Army that had spent the winter of 1799-1800 encamped at Harpers Ferry, puddling and embanking the canal. The rapid progress during this period ended on June 14,1800, when the Provisional Army was disbanded. Once again the extreme shortage of labor limited the progress that could be made on constructing the canal. The canal was completed and water introduced in May 1801, approximately three years after the project had been started and about one year behind schedule.

English engineer James Brindley, in the period April 28, to May 6, 1799, also laid out the course and prepared a plan for the construction of the U.S. Musket Factory dam on the Potomac River. From August 9 to October 22,1799, Brindley, using a small crew of workmen, supervised the construction of the partial masonry dam. After 64 days of work, and by the end of 1799, Pay Master John Mackey reported that the dam was only about one third complete. Paymaster Samuel Annin therefore appears to have supervised the completion of the remaining two-thirds of the dam in the period 1800- May 1801.

The location and nature of the first U.S. Musket Factory canal and dam on the Potomac River, as built in 1799-1801, is shown on the two maps prepared by N. King and L. Harbaugh for the United States and the Potomak Company, dated February 1803, which follow. (Maps No. 2 and 3).

With regards to the new buildings erected in the U.S. Musket Factory yard, Maps No. 2 and 3, Drawn in February 1803, reveal eight such structures had been completed by the end of 1802. These were as follows (See Map No. 3):

1. The Armory or Factory. A 2½ story brick shop with gable roof covered with wood shingles, designed and erected by Paymaster John Mackey in 1799. The 1799 dimensions were given as " 26 feet feet by 120 feet clear of the walls." The 1811 exterior dimensions were given as 29 feet by 123 feet. The workshop stood at the eastern or lower head of the line of Armory shops that stood on the northern bank of the Armory Canal.

The first floor of the Armory contained four wooden water wheels which powered the machinery for boring, grinding, and polishing arms. The second floor served as the shop of the filers and stockers; and the third story or"Garret" was utilized to store musket stocks, lumber, tools, and other stores.

2. The Smiths Shop. A two-story brick shop with wood shingle gable roof, designed and erected by Paymaster John Mackey in 1799. The 1799 dimensions were listed 26 by 80 feet "clear of the walls;" The 1811 exterior dimensions were given as 30 by 83 feet. The structure was located on the north bank of the Musket Factory canal and second from the eastern(or lower) head of the line of Armory shops.

This building had no water wheels or water-powered machinery. The first floor, however, contained 10 forges, each with its own chimney, for the use of the smiths. The second floor served as a workshop for the filers.

3. The Forge or Mill. Probably a one-story brick building with wood shingle gable roof, this shop was designed and erected by Paymaster John Mackey in 1799-1800. The approximate dimensions, judging by Map 3, were 26 by 30 feet. This shop stood on the north bank of the Armory canal and was the third from the eastern (lower) head of the line of workshops .

The Forge or Mill contained one eight-foot breast-type water wheel, the largest wheel at the Armory, which supplied power for the tilt hammer for heavy forging, which was used for working iron and preparing barrel skelps for the hand welders.

The Armory thus had a total of five water wheels, which averaged 4.2 feet in breath, in the three workshops that made up the 1801 plant.[23]

4. The Coal House. Designed and erected by Paymaster Samuel Annin, 1801-02, probably a one-story frame building used for the storage of coal. Judging by Map No. 3, the storehouse was approximately 15 by 20 feet in size. The Coal House was located on the north bank of the Armory canal and stood fourth from the eastern(lower) head of the line of Armory buildings.

5. Proof House. Designed and erected by Paymaster Samuel Annin in 1801-02, this was probably a one-story edifice of frame and stone construction. The structure was used to test muskets. The Proof House, standing on the north bank of the Armory Canal, was the fifth building from the eastern(lower) head of the line of workshops along that canal.

Bldgs. No. 8, 9, and 10, Probably frame structures, use unknown, erected 1800-1802. May have included office for Superintendent, Paymaster, and Master Armorer, also a workshop for the carpenters, and perhaps a latrine or privy.[24]

Bldg. No. 11- Temporary Armory- Superintendent's House: Building located on the north side of the entrance to the U.S. Musket Factory yard from the Wager Ferry Lot Reservation. This 100 feet long, one-story frame warehouse had been erected by John Wager, Sr. in the period 1782 to 1796 and was purchased by the United States on June 15, 1796 for $ 350.00. The warehouse was remodelled in the fall of 1798 for use as a temporary armory or factory, where arms could be

23. Data on machinery from Smith, Harpers Ferry Armory, p.50. "Mr. Brindley"s Sketch of the Wheels... Necessary for the Potomac Works,"August 4,1801, HFNHP Map Case. secretary of War Henry Dearborn to Supt. Perkin, Oct, 26, November 10, 1811, Misc. Letters Sent, Office of the Secretary of War, National Archives Record Group 107.

24. Approximate sizes: Bldg. No. 8, 11 by 18 feet; Bldg. 9, 9 by 12 ft; Bldg. 10, 14 by 12 feet.

repaired until the permanent brick Armory could be constructed in 1799.

In October 1801, Secretary of War Henry Dearborn authorized Superintendent Joseph Perkin "to appropriate to the accommodation of yourself & family so much of the old frame buildings at Harpers Ferry, purchased from Col. Lear (who had handled the purchase of the land for the Armory in 1796-97), as you may find necessary for your convenience, and to have suitable repairs made therein, which you estimate may be done at an expence not exceeding four hundred dollars."[25] The remodelled warehouse, Bldg. No. 11, was to serve as the residence of Superintendent Perkin from October 1801 until his death from "bilious fever" on December 1,1806. Bldg. No. 11 was to be removed from the Musket Factory Yard and re-erected as two brick and frame two-story dwellings in September 1809.

25. Harpers Ferry NHP Microfilm Reel 18, Vol. 1, pp. 22-23.

MAP NO. 2

PLAN AND SECTION of a Canal at the lower Falls of the Shenandoah, and its junction with the public Canal at HARPER'FERRY, and the necessary Locks, Surveyed & Levelled by N. King and L. Harbaugh for the U.S. and the Potomak Compnay, Feby, 1803. Scale 24 poles to an Inch." National Archives Record Group No. 77- Records of the Office of the Chief of Engineers, Fortification Files, Drawer 150, Sheet 2, Cartographic Division, National Archives, Washington, D.C.

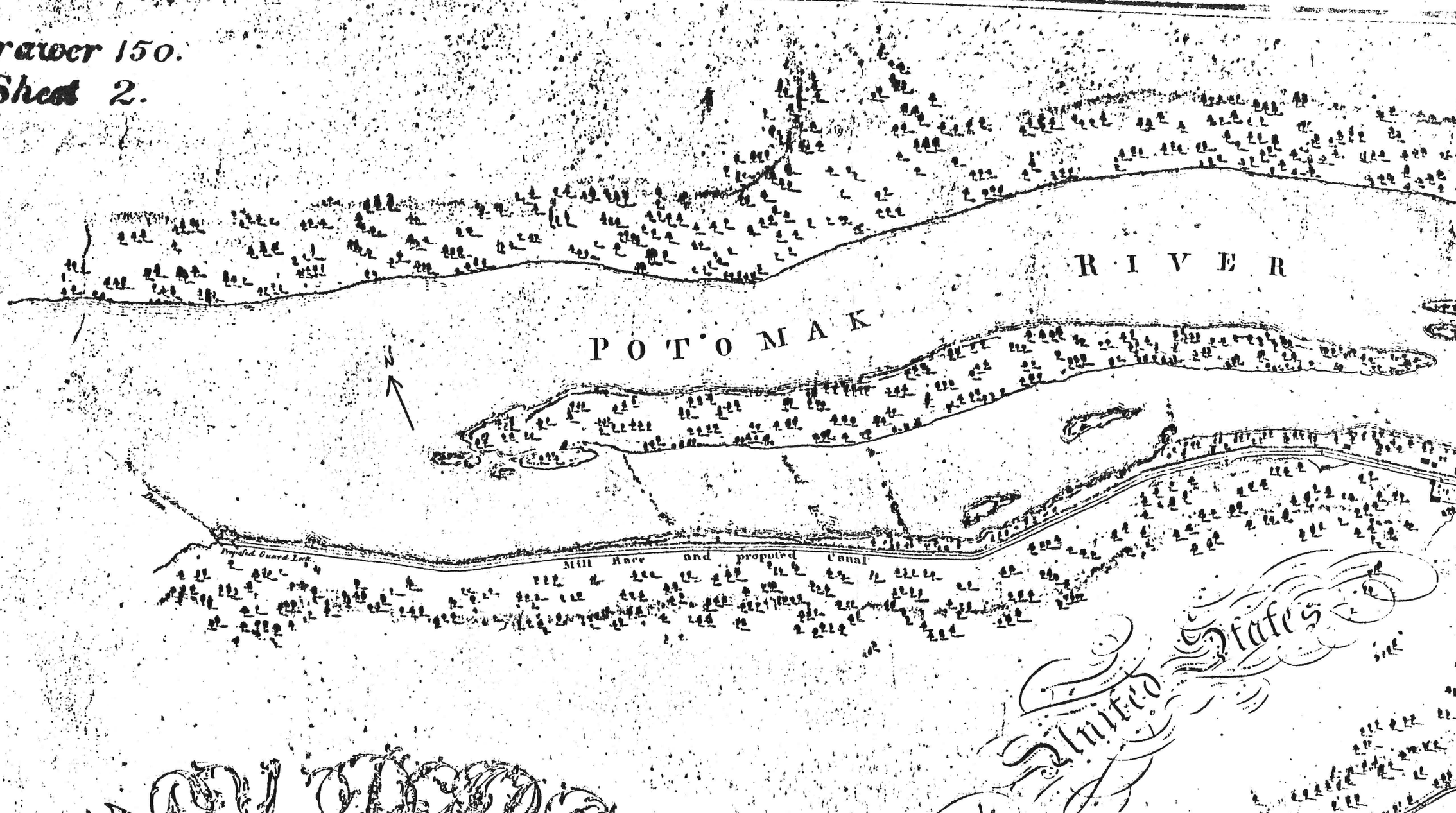
This is the earliest known map that shows the U.S. Musket Factory Canal and Dam on the Potomac River as they were built in 1799- May 1801.

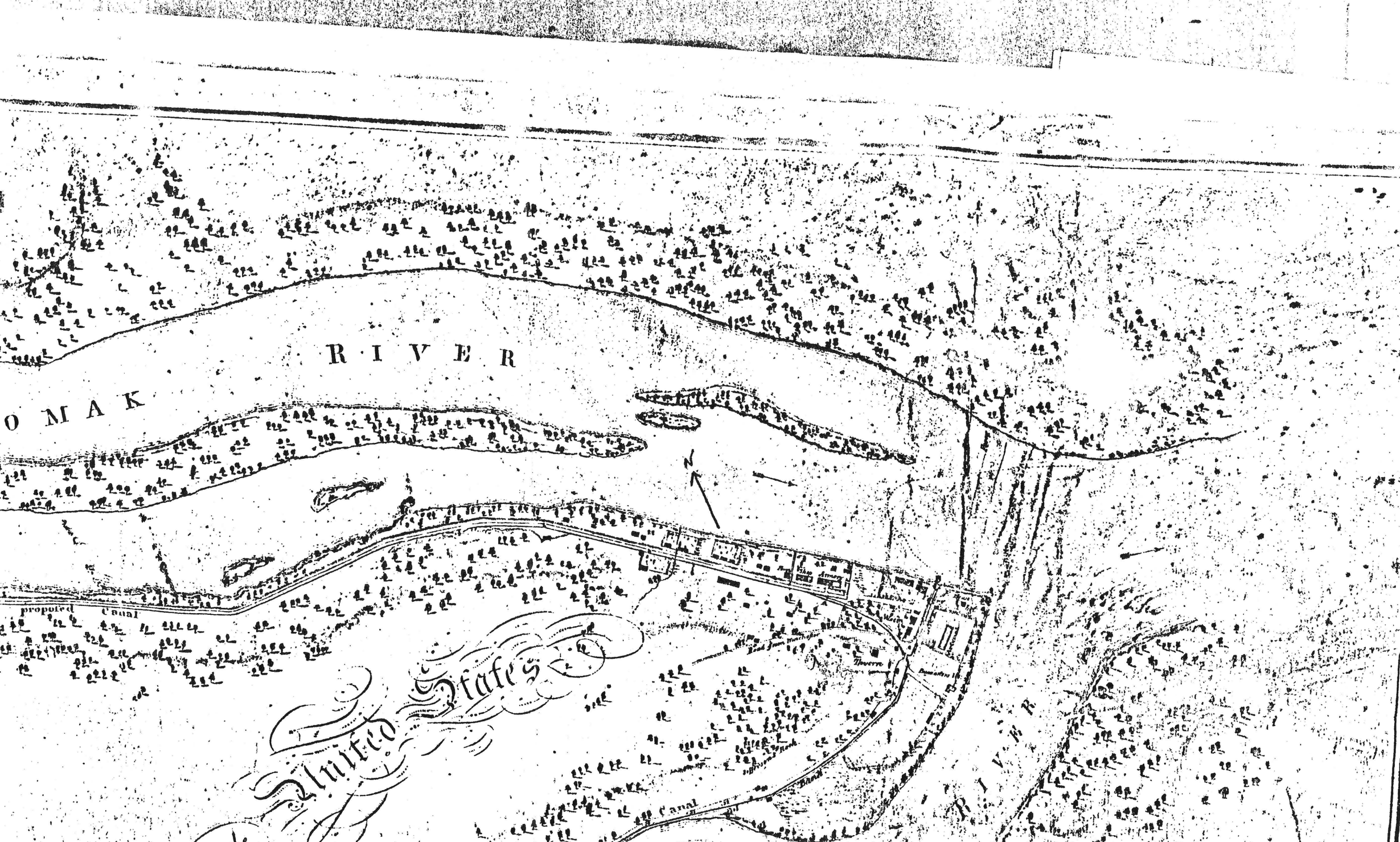
This plan suggests that the new Armory canal be enlarged and improved so that boats coming down the Potomac could enter the canal by means the proposed guard lock that was to be constructed at the upper or western end of the canal, adjacent to the U.S. Dam. Boats were then to proceed eastward via the Armory canal past the U.S. Musket Factory workshops and store houses. From this point, the Armory raceway or canal was to be extended eastward so as to form junction with the proposed Shenandoah Canal, which was to be built northward, following the course of present-day Shenandoah Street, to re-enter the Potomac River.

The Proposed Potomac Canal was never built, probably because it would have greatly interferred with the manufacture of arms of the U.S. Musket Factory. Instead, in 1833, the Chesapeake and Ohio Canal was constructed along the north or Maryland bank of the Potomac River, opposite to Harpers Ferry

The plan was drawn by Nicholas King.

Drawer 150.
Sheet 2.




R I V E R
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N
proposed Canal
United States
Canal
R I V E R

MAP NO. 3

"Plan of the proposed junction of the CANAL, at the lower Falls of Shenandoah, with the Public Canal at HARPER'S FERRY, and the necessary Locks for descending into the Potomak River. Surveyed & leveled by N. King & L. Harbaugh, Feby. 1803, for the Public & the Potomak Company. Scale 4 perches to an Inch." National Archives Record Group No. 77- Records of the Office of the Chief of Engineers, Fortification Files, Drawer 150, Sheet 2, Cartographic Division, National Archives, Washington, D.C.

Numbers added to map by writer. Buildings with numbers are Armory structures and located on U.S. Lands.

Buildings marked with letters are privately owned by the Wager family and are located within the Six Acre Reservation or the Wager Ferry Lot Reservation.

A portion of the large map showing the U.S. Musket Factory buildings and Armory canal or raceway in detail.

Musket Factory Buildings:

1. Armory or Factory, brick, built in 1799, 26 by 120 feet "clear of walls", or 29 by 123 feet, exterior dimensioms in 1811. 2½ stories, with water whbel.

2. Smith's Shop, two-story brick, built 1799, 26 by 80 feet "clear of the walls,"; 1811 dimensions, 30 by 83 feet. Had 10 forges, each with its own chimney.

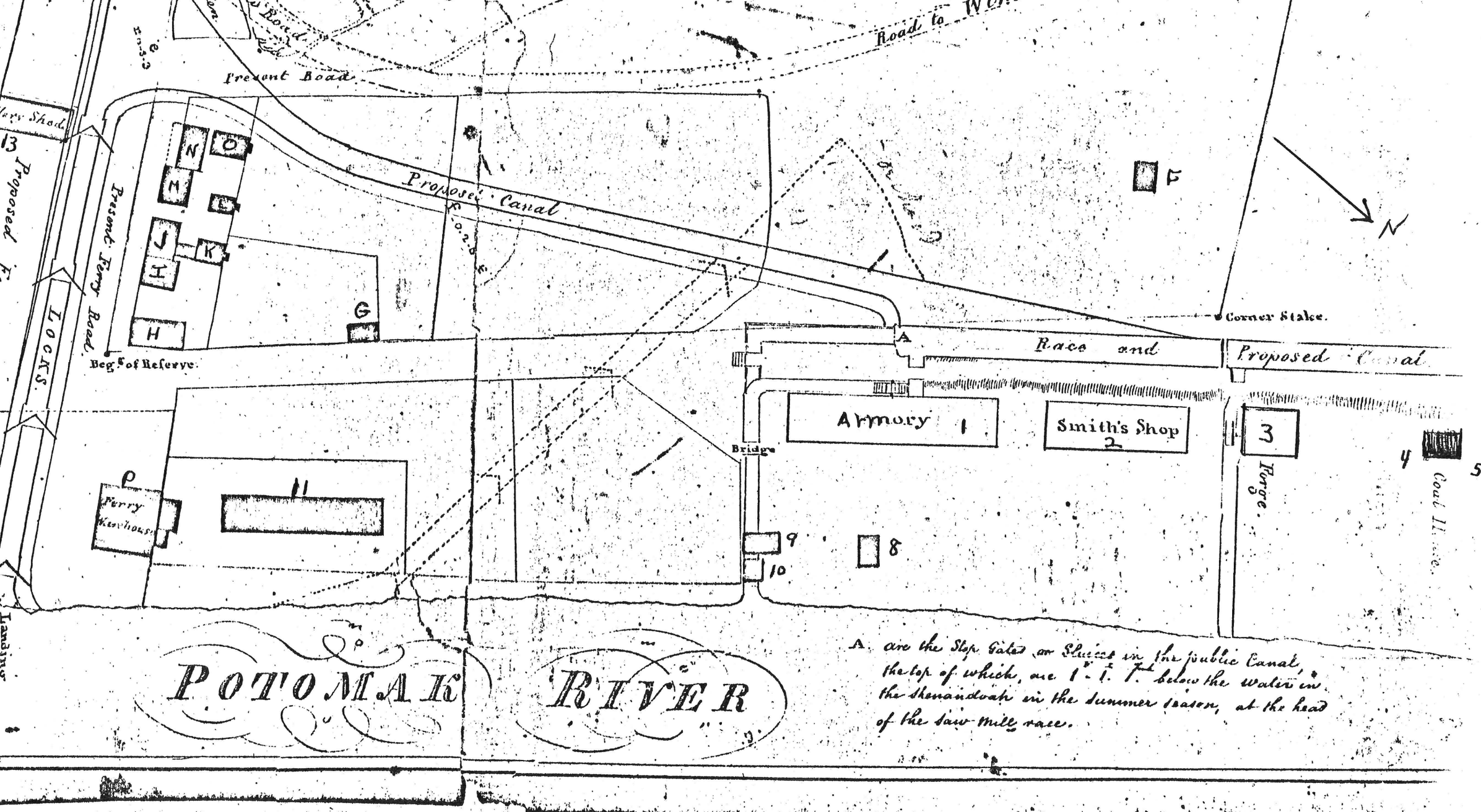
3. Forge or Mill, built 1799-1800, brick, probably one-story, about 26 by 30 feet. One 8-foot breast type wooden water wheel

4. Coal House, probably one story frame, erected about 1801-02.

5. Proof House, one-story, probably of frame and stone construction, built 1801-02. Use to test muskets.

11. Superintendent's Residence, 1801-1807. A 100 foot long one-story frame warehouse purchased from John Wager in 1796. Structure fitted up and used as thetemporary factory or armory in which arms were repaired, 1798 to 1801. In October 1801 the structure was remodelled at a cost of $ 400 into a residence and it served as the home of Superintent Joseph Perkin from late 1801 until his death in December 1806.

Use of Buildings No. 6, 7, 8, 9, and 10 are unknown.



A. are the Stop Gates or Sluices in the public Canal, the top of which, are 1 - 1. 7th below the water in the Shenandoah in the summer season, at the head of the saw mill race.

CHAPTER III

THE U.S. MUSKET FACTORY, 1802 - 1807

The vouchers of the Harpers Ferry Armory Paymasters for the years 1798 to 1816, issued to pay for labor, materials used in construction and repairs, as well as the manufacture of arms, are no longer extant, having apparently been destroyed by a fire in the Treasury records during the first part of the 19th century. Most of the Paymasters' vouchers for the years 1817 to December 31, 1851, however, are still to be found in the National Archives at Washington, D.C., Record Group No. 217, Records of the General Accounting Office, Records of the Second Auditor of the Treasury Department, Series One, Two, and Three.[1]

Because of the destruction of the early records, the amount of detailed information on the construction of individual buildings prior to 1817 is extremely limited.

No major buildings were apparently erected at the Musket Factory during the years 1802 to 1807. A brick powder magazine was erected on Camp Hill in 1803 and a second arsenal (the Small Arsenal) on Arsenal Square, in 1806-07, but nothing in the Musket Factory yard.

The total number of arms, flintlock muskets and rifles, produced at the Harpers Ferry Armory from 1801 to December 31, 1807 was 10,050 weapons.[2]

Expenditures for new construction and repairs from January 1,1802 to December 31, 1807, totalled $ 48,742.83. The annual expenditures were as follows:[3]

1. All surviving fiscal records of the 1798-1816 period are located at the Federal Record Center at Suitland, Maryland.
2. American State Papers, Military Affairs, Vol. II, p.481.
3. Ibid., II, p.481 and number of armorers employed from ASP- MA, Vol. V, p.915.

Year:	New Construction	Repairs	No. of Armorers
1802	$ 4,698.92	$ 1,512.97	20
1803	4,905.13	1,715.32	37
1804	4,159.25	2,624.46	51
1805	2,696.15	2,117.34	67
1806	12,329.20	1,856.43	71 Sm
1807	8,543.50	1,584.16	87
Total: 1802-07:	$ 37,332.15	11,410.68	48,742.83
Total 1798-1801	$ 43,704.06	1,234.50	44,938.56
GRAND TOTAL: 1798-1807:	$ 81,036.21	12,645.18	93,681.39

CHAPTER IV

ENLARGING THE MUSKET FACTORY PLANT, 1808 - 1813:

In 1803, the Napoleonic wars resumed in Europe, Both France and Great Britain clamped restrictions on the neutal carrying trade in order to deprive the other of the means of war. American merchant vessels were caught in the middle of this power struggle and were roughly treated by both sides. President Thomas Jefferson had permitted the American navy to decay and the U.S. army was very small.

In early 1808, after experiencing many problems in Europe, President Jefferson and his Cabinet decided that it might be wise to rearm. In a series of appropriation bills, the Republication administration made a 180 degree turn and voted $ 2,000,000 to increase the army to 10,000 men. The following sums were also provided for the following purposes:

$ 850,000 to construct a fleet of small gun boats.

1,000.000 to erect coastal fortifications at the chief ports.

748,642.05 for the following ordnance purposes:

For regular expenses: $ 80,000.

For arsenals, armories, and arming the fortifications-$ 218,642.05.

To purchase arms from private arms contractors: $ 300.000.

To purchase saltpeter and sulpher to make gunpowder - $ 150,000.

To arm the militia of the States - $ 200,000.[1]

Superintendent Joseph Perkin had died on December 1, 1806, and in April 1807, Secretary of War Henry Dearborn selected James Stubblefield,[a] gunmaker and resident of Stevensburg, Culpeper County, Va., to be the second superintendent of the U.S. Armory at Harper's Ferry. Stubblefield and his family reported for duty at the Armory on May 14, 1807.

1. U.S. Statues at Large, Vol. II, pp. 470, 473, 490, and 497. Acts of March 3 and 11, and April 23 and 25, 1808.

By the fall of 1807 the War Department was considering the possibility of increasing the number of arms that were being produced at the armories at Harpers Ferry and Springfield . In response to these questions, in late October Superintendent Stubblefield informed the War Department that if they added 35 feet to the Armory (Bldg. No. 1 on the 1803 map) and 20 feet to the Smiths' Shop (Bldg. No. 2 on the 1803 Map), there would be enough space to employ "up to 100 hands."[2] On November 11, 1807, the War Department directed Paymaster Samuel Annin "to please adopt measures for making an addition of 35 feet to the Armory and Twenty to the Smiths' Shop, also an additional water wheel and such other apparatus as may be necessary, the whole to be constructed under the direction of Mr. Stubblefield."[3] On May 25, 1808 and before the approved work on the proposed additions to the shops could have gotten underway, the War Department authorized Stubblefield to arrange for and to construct whatever additional buildings that he thought were necessary and to do it as quickly as possible.[4]

Because the sky was now the only limit on new construction, Stubblefield dropped his 1807 proposals to erect additions to the two older Musket Factory shop and instead, in 1808 -09, built completely new workshops.[5]

2. Stubblefield to War Department, Oct. 1807, HFNHP Reel 18,Vol.3,p. 286.
3. HF NHP Reel 18, Vol. 1, p.63.
4. Reel 18, Vol. 1, p.74.

5. The 1810 list of public buildings gives the same dimensions as the Armory and Smiths' Shop had in 1799, thus indicating that the proposed extensions were not erected in 1808.

With some $ 218,000 available for use at the arsenals and armories, the War Department now hoped to doubèe the production of small arms at the Springfield and Harper's Ferry National Armories. On June 3, 1808, Secretary Henry Dearborn explained his plan to Stubblefield, writing:

> It has been determined to enlarge the Armoury Establishment both at Springfield & Harpers Ferry, & I have given Mr. Annin directions to commence the erection of the necessary buildings, water works, machinery & Apparatus without delay & to have the whole performed on such dimensions & in such manner, as he and you shall agree on generally. For the machinery etc. you will from time to time furnish him with sketches, drawings or directions which he will follow.
>
> It is desirable that the buildings & machinery should be such as may be sufficient for as many workmen, as would be necessary for the manufacture of from 15 to 20,000 muskets annually & a due proportion of Rifles, Pistols & Swords.[6]

In the period 1808 to 1809, Superintendent James Stubblefield designed and Paymaster Samuel Annin erected seven new brick workshops, thus bringing the total number of such factories to nine. Five of these new edifices were built in the U.S. Musket Factory yard on the Potomac, thus increasing the number of brick shops at that establishment to seven. The other two new brick workshops were constructed on the Lower Hall Island in the Shenandoah River, thus marking the first use of the Shenandoah's water power to manufacture arms. (The Armory saw mill had been located on the Lower Hall Island since 1797).

Rebuilding the Potomac Dam, 1808-09:

Early in 1808 Paymaster Samuel Annin warned the War Department that the first Potomac Dam, erected in 1799-1801, might fail at any time, due in part he thought to the poor materials that had been used in the original construction. After consulting with Superintendent James Stubblefield, Annin informed the War Department that he had decided to built a new dam which would be located approximately six to eight feet below (east of) the first dam. The new dam was to utilize the old dam structure to the extent

6. HFNHP Reel 18 Vol. 1, p.77.

that the two dams were to be secured together by means of "bolts and ties of locust."[7] On November 14, 1808, Paymaster Annin reported that the first Potomac dam of 1799-1801 had actually given way as feared, and that he was now superintending the construction of the new and second dam.[8] The second dam presumably was completed by early 1809, as the production of arms, using water powered machinery, continued in 1809. The destruction of the Paymaster's vouchers covering the construction of the second dam and the purchase of materials used in the structure during the first part of the 19th century eliminated the chief source of data regarding the nature of the second dam.

Expenditures for new construction and repair, 1808 to 1813, were as follows:

EXPENDITURES, 1808 to 1813:[9] Total: $ 139,144.77.

YEAR	New Construction	Repairs	No. of workmen	No. of new Arms made:
1808	$ 40,655.32	$ 2,356.87	153	5,259
1809	37,231.26	2,732.21	197	7,348
1810	14,192.90	2,448.55	209	9,400
1811	9,125.06	3,048.36	210	10,000
1812	11,032.48	2,732.58	208	10,200
1813	10,560.83	3,028.35	210	9,000
1808-1813:	$ 122,797.85	$ 16,346.92	$ 139,144.77	51,207
1798-1807	81,036.21	12,645.18	$ 93,681,39	10,050
grand TOTAL 1798-1813	$ 203,834.06	$ 28,992.10	232,826.16	61,257

7. HPNHP Reel 18, Vol. 3, p.255.
8. HFNHP Reel 18, Vol. 5, p.411.

9. Expenditures and Arms made from ASP, II, 481; Number of workmen from ASP, V, 915. In 1811 $ 2,000 of the funds for new construction were used to erect six new brick dwelling houses for armory workmen.

Detailed plans and specifications for the seven new brick shops constructed in 1808 - 1813 have not been found in the collections of the National Archives at Washington, D.C.

Although the original plans for the buildings no longer exist, the following two lists provide considerable data, including the dimensions, number of stories, materials constructed of, and the use made of all Armory structures in 1810 and 1811:

(1)"Public Buildings at Harper's Ferry in Virginia , 1st January 1810," prepared by Samuel Annin, Military Storekeeper,[10]

(2) "Public Buildings at Harper's Ferry in Virginia, 1st October 1811." prepared by Samuel Annin, Military Storekeeper, [11].

Description of the Buildings at the U.S. Musket Factory, 1811:

In the construction program of 1808 -1810, the original single line of workshops that had been situated on the north bank of the Musket Factory Canal was extened to the east and two the west. In addition, a second line of large brick shops was erected on the bank of the Potomac River, paralleling the original southern lines of factories. The two lines of shops were separated by a street, known as Potomac Street, which was about 70 feet wide. Within the two rows, the large brick shops were arranged symmetically, so that workshops of about equal length stood approximately opposite to each other.

In 1811 there were a total of 10 shops located in the Musket Factory yard. Eight of these were of brick, and two of wood. In addition, Superintendent James Stubblefield's new brick house, erected in 1807-08, stood in the Musket Factory yard at the eastern(lower) head of the southern line of workshops.

10. National Archives Record Group 107, Secretary of War Letters Received, A-29(5),submitted by Samuel Annin,March 17,1810. Photostat of list in Park Library Collection.
11. National Archives R.G. 107- Sec. of War Letters Received, A-72 (5), submitted by Annin,Oct.28, 1811. Photostat of list in Park Library.

1811

THE SOUTHERN LINE OF WORKSHOPS, LOCATED ON THE NORTH BANK OF THE MUSKET FACTORY CANAL and reading from east to west:

Our No.	1811 list No.	Material Built Of	Dimensions in Feet	No. of Stories	Remarks
2	8	Brick	131 by 45	2	1st story a finishing shop, water wheel, machinery & storage room for musket stock 2nd floor- Superintendent's Office, store room, a filing shop, and a room used as a meeting or church room. [Constructed in 1809-1810]
3	3	Brick	123 by 29	2	Used in 1811 for different machinery for manufacturing arms. (Water wheel [This is the "Armory" or "Factory", erected in 1799 and Bldg. No.1 on the 1803 Map.]
4	6	Brick	83 by 30	2	1st story had 10 Smiths forges, each with a chimney; 2nd floor used as a filing shop. (No water wheel or machinery. [This is the "Smiths Shop" that was built in 1799 and is Bldg. No. 2 on the 1803 map.].
5	7	Brick	101 by 30	2	1st story tilt shop, with water wheel and machinery, also store room for iron. 2nd floor used in 1811 to provide lodging rooms for the workmen. [Built in 1808-09.]

The four brick structures, beginning with No. 2 and running west to Bldg. No. 5, formed the southern line of Musket Factory workshops. The shops abutted on the north bank of the Armory Canal so that water from the canal could turn the water wheels in Shops No. 2, 3, and 5. Our Bldg. No. 1, of course, at the eastern head of this line of workshops, was the Superintendent's Quarters, built in 1808-09, two stories, and brick.

The Superintendent's House was described on the 1811 as follows: "Bldg. No. 11, brick, 36 by 20 feet, two stories & cellar kitchen. for the accommodation of the Superintendent of the Armory."

1811

THE NORTHERN LINE OF WORKSHOPS(ON THE BANK OF THE POTOMAC RIVER-)
(Low number at the western or upper end, reating east to the high number at the eastern or lower head of line):

The following four brick buildings formed the second or northern line of workshops at the Musket Factory. They stood on the bank of the Potomac River and ran parallel to the southern line. The numbers read from west No. 6 to east (No. 9)

Our No.	1811 list No.	Materia Built of	Dimensions in feet	No. of Stories	Remarks:
6	13	Brick	25 by 25	1½	1st floor used as foundry, 2nd floor used for lodging rooms for workmen. (Erected 1808-09, this is a probable location only).
7	27	Brick	83 by 29	2	1st story had 10 Smiths forges, each with its own chimney; second story still unfinished in 1811. (Built in 1809-10-no water wheel or machinery. Stood opposite to Bldg. No. 4.)
8	5	Brick	123 by 30	2	1st story-16 smiths forges, each with on chimney. 2nd floor intended for use as filing shop, but used in 1810-1811 as logging rooms for workmen. (Built 1808-09, no water wheel or machinery, stood opposite to Bldg. 3)
9	4	brick	131 by 30	2	1st floor-16 smiths forges, each with chimney; 2nd floor used as stocking shop. (Erected 1808-09. No water wheel or machinery, Stood opposite to Bldg. No. 2).

The roofs of all eight brick workshops were covered with wood shingles in 1811.

Also located in the U.S. musket Factory Yard and probably situated at the western end of the southern line of brick workshops were the following two structures:

Our No.	1811 No.	Materials	Dimensions in Feet	No. of Stores	Remarks
10	25	Wood	26 by 19	one	Carpenter Shop (Built 1808-09).
11	36	Wood	44 by 19	one	low. Lumber room for carpente work (built in 1808).

Harpers Ferry Armory and Arsenal and the War of 1812:

Between 1801 and December 31,1813, a grand total of 61,257 small arms were manufactured at the Harper's Ferry Armory and passed through the doors of the two arsenals . Records indicate that in 1812-14, during the War of 1812, the Harper's Ferry Arsenal shipped 27,500 flintlock muskets, 1,000 flintlock rifles, 500 carbines, and 500 pistols, together with 500 cartridge boxes, 30,000 cartridges, 10,000 flints, and 100 cavalry swords to Pittsburg, Pennsylvania, and Knoxville, Tennessee. A total of 29,500 firearms were sent to support the war effort, leaving a balance of 31,757 arms still in storage, not including the weapons produced in 1814.[1] The cost of shipping these arms west and south was $ 18,720.77.[2] 23,500 arms were sent in 1812 and 6,000 in 1814.

In 1817 and 1818, an additional 10,000 weapons were shipped to Pittsburg, these included 2,000 rifles and 8,000 muskets.[3] Cost of transporting these weapons was $ 2,848.17.[4]

1. ASP, II, p.514. Report of Peter Hagner, Third Auditorss Office, Treasury Department, to Congress, September 7, 1822.
2. Ibid.
3. Ibid.
4. Ibid.

CHAPTER V

THE U.S. MUSKET FACTORY ,1814- 1821

The figures for expenditures on new construction and repairs at the National Armory at Harper's Ferry for the eight year period 1814-1821 totalled $ 90,438.47. Of this sum, only $ 52,675.35 went for new construction and the large amount of $ 37,763.12 went for repairs, suggesting the physical plant of the Armory was wearing out rapidly . A number of small workshops and storehouses were erected at the U.S. Musket Factory. One old saw mill was remodelled and one smith shop was erected on the Lower Hall Island and turned over to Captain John H. Hall in 1819 for use in the manufacture of his patent rifle. No large building, however, appears to have been constructed from 1814 to 1821. The major construction program during these years occurred in 1820-21 when a 300 foot length of stone masonry dam was added to the U.S. Musket Factory dam on the Potomac at an approximate cost of $ 11,200.

Year	EXPENDITURES FOR New Construction	Repair	No. of Workmen	No. of Arms produced
1814	$ 1,681.23	$ 3,755.91	210	12,000
1815	0	3,244.72	202	6,848
1816	2,984.12	4,758.88	222	8,468
1817	4,939.64	4,360.25	231	11,239
1818	4,563.24	4,340.33	237	12,592
1819	9,554.05	4,782.27	247	10,344
1820	16,934.50	5,164.52	271	11,649
1821	12,018.57	7,356.24	251	10,320
1814-21:	$ 52,675.35	$ 37,763.12	90,438.47	83,460
1798-1821	$ 256,509.41	$ 66,755.22	323,264.63	114,717

A comparison of the 1810-11 List of Buildings at the Harper's Ferry Armory with "A Statement of the Number and Dimensions of the Buildings at the U. S. Armory at Harper's Ferry, together with the Material of which they are built and their estimated Value," dated November 30,1821,[1] reveals that the following 8 buildings with a total estimated value of $ 3,150.00 were constructed at the U.S. Musket Factory after 1811 and prior to November 30, 1821:

Buildings	Estimated Value	Date Constructed
1. Draw grinding shop	$ 150	
2. Proof House	$ 200	
3. Stone Coal Store House	$ 400	
4. Tempering Shop	$ 200	1817
5. Iron Storehouse	$ 1,000	
6. Charcoal House	$ 400	1819
7. Superintendent's Office	$ 500	
8. Fire Engine House & Lodging Room	$ 300	
Eight structures:	$ 3,150	

Also one saw mill on the Potomac Canal at an cost of $ 472.75 in 1819.

The vouchers of the Armory Paymasters, beginning July 1, 1817 through December 31, 1851, in National Archives Record Group 217, Records of the Second Auditor, Series one, Two, and Three, are still largely extant. These documents provide the following information on edifices erected 1817 to 1821.

A small tempering shop for barrels, wood, one-story, 26 by 16 feet and valued at $ 200.00 was apparently constructed at the Musket Factory in 1817.[1 2]

1. American State Papers, Military Affairs,, Vol. II, pp. 482-483.
2. Ibid., II, p.483, for description of building.

On August 21 ,1817 Charles Fouke was paid $ $ 83.25 for the carpenter work in "erecting a Small Smith shop for barrels."[3]

In On September 11, 1818 the mason Henry James received $ 130.00 for "building a Puddling Furnace for welding the boring and scrap iron of the Armory.[4] On December 15,1818 he was paid $ 6.50 for laying 33 perches of stone wall to tail race of the trip hammer shop.[5]

In 1819 a new coal house and a new saw mill, the latter erected on the bank of the Musket Factory Canal, were constructed. On October 14, 1819, the masons William McKinny and George Buffington received $ 215.25 for the following masonry work: providing and erecting"287 perches of stone wall for a Coal House and a guard wall; pitt and foundation for the new sawmill being built on the Potomac River for the Armory.[6] The new coal house was a one-story wood building, 30 by 30 feet in size, and valued at $ 400.00.[7]

The old saw mill, located on the Shenandoah, was turned over to Captain John H. Hall in 1819 for use in manufacturing his patent rifle. On August 2,1819 Superintendent Stubblefield requested permission from the Chief of Ordnance to spent up to $ 250.00 to built the necessary replacement saw mill on the Potomac.[8] Col. Wadsworth granted this request on August 19,1819.[9]

3. National Archives Record Group 217, 2nd Auditor, 1st Series, File 908, Voucher no. 49.
4. R.G. 217, 1st Series,File 1418, Voucher 35.
5. R.G. 217, 1st Series File 1736, Voucher 57.
6. R.G. 217, 1st Series, File 3266, Voucher No. 21.
7. American State Papers, Military Affairs, Vol. II, p.483.
8. Harpers Ferry NHP Reel 13, Vol. 3, pp.230-231.
9. HF NHP Reel 14, Vol. 3, p.220.

Construction on the new saw mill got underway in September 1819 and on October 14, Andrew Lang was paid $ 15.50 for 15½ days labor excavating for the foundation wall of the Potomac sawmill.[10]

James Huston did the millwright work on the sawmill, charging the Armory a total of $ 242.00 for the services of his assistant and himself for 121 days work.[11] Total cost of construction of saw mill, including the foundations of the new coal house, thus came to about $ 472.75.

On December 31, 1819, Thomas Morgan and William Harbert received $ 256.00 for "quarrying 640 perches of stone for erecting a armory shop & a dwelling house."[12] The carpenter Charle Fouke was paid $ 34.50 on August 24, 1819"for 10½ days work making a shed for scrap iron."[13]

Under repairs, the mason Samuel Collins was paid $ 10.00 on October 18,1819 "for building a hearth for ~~X~~ smiths fire on the improved plan."[14] The mason Henry James also received $ 50.00 on March 13,1819 " for building two hollow smiths fires on an improved plan."[15] On June 30,1819, he was paid $ 34.56 for repairing"smiths hearths."[16] On October 19,1819 Henry James also collected $ 35.00 for" 17½ days work repairing the puddling furnace."[17]

During the period period July 1, 1817 to December 31,1820, Superintendent James Stubblefield spent a total of $ 908.73 to have the Musket Factory workshops and the two brick Arsenal buildings, the latter on Arsenal Square, painted.[18]

10. R.G. 217, 1st Series, File 3266, Voucher 20.
11. R.G. 217, 1sy Series, File 3266, Voucher 65, paid on November 30, 1819.
12. R.G. 217, 1st Series, File 3266, Voucher 99.
13. R.G. 217, 1st Series, File 3132, Voucher 44.
14. R.G. 217, 1st Series, File, 3266, Voucher 24.
15. R.G. 217, 1st Series, File 2336, Voucher 21.
16. R. G. 217, 1st Series, File 2669, V ucher 81.
17. R.G. 217, Series 1, File 3266, Voucher 13.

In a letter to Colonel Wadsworth dated February 19, 1820, Stubblefield reported of the painting: "I had the Arsenals and workshops painted (last year), which were suffering for it, having never been painted before...."[19] In this work the wood shingle roofs and woodwork of the brick structures were painted.[20]

Also constructed in 1819 was a new Charcoal House, a one-story frame structure, 111 feet long and 30 feet wide, which was valued at $ 400.00.[21] Superintendent James Stubblefield notified Chief of Ordnance after the fact of this construction, early in 1820, explaining: "I was compelled to build a new [store] House for charcoal, the old one having fallen down..."[22]

Of the uses of the puddling furnace, Stubblefield reported, also in early 1820: "In the last year we purchased bar & land Iron to the amount of $ 25,000 and also completed our pudling Furnace & Forge and made 60 tons of bar Iron, out of borings, trimmings of the [musket] barrels..."[23]

Also erected prior to 1819 were a proof house, a one-story wood and stone structure, 14 by 12 feet and valued at $ 200.00,[24] and an annealing house. Both of these structures stood on the bank of the Potomac River in the Musket Factory Yard. This information is based on the fact that by 1819 the river had started to undermine the foundations of these two edifices and require corrective work.

18. Records of the Second Auditor of the Treasury Department, First Series, in National Archives Record Group, No. 217, Records of the U.S. Treasury Department, Washington, D.C. File No. 907-Vouncher 21;F.908-V.33;1162-V.6 and V.32; f. 3132- v.41, v. 74; f. 3266- v. 44, v.81.; 4490-v.23,27, 93; and F. 4591-v. 44. The painters were, Daniel Carty,1820-$ 274.75; Jonathan Nixon, 1819-20, $ 173.38; Leonard Sadlor, 1817-20, $ 373.25; Joshua J. Rowles, 1817, $ 51.50; and John Sellers, 1818, $ 14.00.

19. Harpers Ferry National Historicl Park Microfilm Reel 21, Vol. 4,pp.341-342.
20. R.G. 217- F. 908- V. 33 to Leonard Sadlor, Sep.t 20,1817.
21. American State Papers, Military Affairs, Vol. II, p. 482.
22. HF NHP Reel 21, Vol. 4, p.p.341-342.
23. Ibid.
24. American State Papers, Military Affairs, Vol. II,p.483.

Superintendent James Stubblefield reported in early February 1820 of this 1819 work, writing: " We had also to finish a stone wall on the (Potomac) River(to keep) the Bank from washing on which our proof House and annealling Fires stood & had been undermined by the high water, which cost several hundred dollars (to build.)" [25]

On May 15, 1819, the masons Henry James and William McKinny were paid $ 15.62 for laying 25 perches of stone wall "for River Wall." [26] On November 30,1819, the mason Edward Harding received $ 608.88 for laying 876 perches of stone wall; some of Harding's work may have related to the river wall project. [27]

During 1820 the mason Henry James was paid a total of $ 250.75 for the following work at the Musket Factory:

Date	Amount	Work
Feb.19,1820	$ 30.50	Repair of furnace, smiths hearth. [28]
Aug.19,1820	75.25	Repair of hollow forges at Furnace. [29]
Oct. 14,1820	145.00	Buildinga chimney to the Tilt Forge and hew free stone of the furnace and building same. [30]
Total:	$ 250.75	Henry James,Mason

The mason Jonah N. Tompkins also received ¢ $ 62.34 on June 14,1820 "for repairs of buildings and annealing furnace." [31]

The painter Daniel H. Carty was paid a total of $ 274.75 for his work in 1820, which included "painting roofs of workshops," as well as painting and glazing. [32]

25. Stubblefield to Col. Wadsworth, Chief of Ordnance, February 19,1820, HF NHP Reel 21, Vol. 4, pp.341-342.
26. R.G. 217, 1st Series, File 2669, Voucher 81.
27. R.G. 217, 1st Series, File 3266, Voucher 66.
28. R.G. 217, 1st S., File 3563, Voucher 24.
29. R.G. 217, 1st S., File 4490, Voucher 33.
30. R.G. 217, 1st S., File 4490, Voucher 5.
31. R.G. 217, 1st S., File 3939, Voucher 64
32. R.G. 217, 1st S., File 4490, Voucher 93- Sept. 30,1820,for $ 136.50; Voucher 23, October 31,1820-$ 45.50 for painting roofs of workshops; and File 4591,Voucher 44, December 30, 1820, -$ 92.75 for 53 days work glazing and painting.

On June 29,1821, the mason Henry James received $ 45.50 for"repairing puddling furnace and building an annealing furnace," which were probably located at the Musket Factory.[33] In 1821 Thomas McKinney was paid a total of $ 54.00 for quarrying 141 perches of stone for building stone walls. Included were "100 perches of stone for building a new wall in the grinding mill."[34]

During May and June of 1821 Leonard Sadler received a total of $ 90.72 for 54 days work painting armory workshops and dwelling houses.[35]

A DESCRIPTION OF THE PHYSICAL PLANT OF THE NATIONAL ARMORY AT HARPER'S FERRY, VIRGINIA, in 1821:

1. The U.S. MUSKET FACTORY ON THE POTOMAC, 1821:

The 1821 visitor reported: " The public buildings of the workshops (at the U.S. Musket Factory), two stories, stand in two straight lines, leaving bet of about 70 feet, and forming a handsome street. hese buildings, a canal, at the head of which is a d use of the shops. The public buildings are thirte structures at the Musket Factory, on Arsenal Square, and at the Hall Rifle Factory)- eleven of brick, one stone and one frame..."

DO Not Film

Of the buildings at the Musket Factory, he further noted that they "contain machinery for various purposes, and are (generally) 130 ft. by 30 ft." in size.[36]

33. R.G. 217, 1st Series, File 5208, Voucher 118.
34. R.G. 217, 1st S., File 4830- Voucher 83- March 24, 1821 for $ 40.00 for 100 perches of stone for grinding mill; File 5208, Voucher 3, $ 4.00 for 16 perches of stone,April 9,1821; File 5208, Voucher # 42. May 9,1821, $ 10.00 for 25 perches of stone for building a stone wall.
35. R.G. 217, 1st Series, File 5208, Voucher 96,- June 14,1821-$ 70.56 for 42 days work; Voucher 120- June 29,1821, $ 20.16 for 12 days work.
36. "Description of Harper's Ferry, Virginia, written Saturday, June 21,1821," copied from a manuscript that was owned in 1958 by Mrs. E. Bruce Allen of Moorefield, W. Va.

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SOUTH LINE OF MUSKET FACTORY SHOPS, ADJACENT TO THE ARMORY CANAL, SHOPS NO. 1 to 5,(reading from East to West:

Our No.	1811 No.	1821 dimension in feet	No. of Stories	Material	Value	Remarks
1.	11	36 by 30	2 + cellar	Brick	$ 3,000	Supt's Quarters. built 1808-09.
2.	8	131 by 45	2	Brick	$ 15,000	Workshop,built 1809-10, as finishing shop, had water wheel.Known as Bell Shop after 1825.
3.	3	120 by 30	2	Brick	$ 10,000	Workshop(built 1799 as Armory or Factory)known as Boring Mill,had water wheel.
4.	6	80 by 30	2	Brick	$ 6,000	Storehouse in 1821 (built 1799-1800 as Smiths Shop with 10 forges & 10 chimneys,)
5.	7	111 by 30	2	Brick	$ 8,000	Workshop in 1821(stocking shop)(built in 1808-09 as Tilt Hammer shop) had water wheel.

NORTH LINE OF MUSKET FACTORY SHOPS, ADJACENT TO POTOMAC RIVER, AND RUNNING PARALLEL WITH SOUTH LINE(Reading from west to east).(Shops set opposite to each other according to length so as to match.)

6.	27	80 by 30	2	Brick	$ 6,000	Workshop for Smiths in 1821(built 1810-11 as smiths and filing shop) had 10 forges & 10 chimne no water wheel.
7.	5	120 by 30	2	Brick	$ 10,000	Workshop(for smiths in 1821)(built in 1808-09 as smiths & filing shop, had 16 forges & 16 chimneys, no water wheel.
8	4	130 by 30	2	Brick	$ 12,000	Workshop(for Smiths in 1821.)(Built in 1808-09 as smiths shop & stocking shop).had 16 forges, 16 chimneys, no water wheel.

The estimated total value of the seven major brick shops located in the U.S. Musket Factory Yard was placed at $ 67,000.00.

In addition to the large brick workshops, there were 8 lesser Armory shops and storehouses, chiefly built of wood, in 1821 that may have been located in the U.S. Musket Factory Yard. The exact location of the structures, all of which had been built after October 1,1811, has not, in many cases, been established:

Our No.	Dimensions in feet	No. of Stories	Material	Value	Remarks
8.	18 by 18	1	Wood	$ 150	Draw-grinding shop,probably located on Armory Canal-sou line,with water wheel.
9.	14 by 12	1	Wood & Stone	$ 200	Proof House,located on bank of Potomac,north line of shops.
10.	30 by 30	1	Wood	$ 400	Stone Coal House,built 1819, Musket Factory yard.
11.	25 by 16	1	Wood	$ 200	Tempering Shop,built 1817, Musket Factory Yard.
12.	120 by 16	1	Wood & Stone	$ 1,000	Iron Storehouse,Musket Factory Yard.
13.	111 by 30	1	Wood	$ 400	Charcoal House,built 1819, Musket Factory yard.
14.	18 by 18	2	Wood	$ 500	Supt.Office,probably located in center of Mukset Factory Street opposite to his residence.
15	12 by 12	2	Wood	$ 300	Fire Engine House and Lodging Room, U.S. Musket Factory.
Value of 8 structures:				$ 3,150	
Value of 7 large brick shops:				$ 67,000	
Total Value of 15 Musket Factory Bldgs.				$ 70,150	

The Armory sawmill, constructed on the bank of the Musket Factory Canal in 1819, was comprised of wood and stone and valued at $ 1,000.00 in 1821.[37]

In addition, there were several structures at the Musket Factory that for some reason were not included on the 1821 inventory of public buildings. These included (1) a brick puddling furnace for welding barrels and scrap iron that had been erected in 1818 at a cost of $ 130.00; and (2), a brick annealing furnace that had been constructed on the bank of the Potomac River prior to 1819 at an estimated cost of $ 130.00.

Total estimated value of these 18 workshops, store houses, and furnaces in 1821 was $ 71,410.00. With the Superintendent's Residence included, the total value of the 19 structures standing in the Musket Factory yard in 1821 stood at $ 74,410.00.

37. American State Papers, Military Affairs, II, p. 483. The 1821 inventory fails to give the dimensions of the armory saw mill.

National Archives Record Group No. 217- Records of the United States General Accounting Office, Washington, D.C. Records of Second Auditor: Reccords and Accounts from the Paymaster of the U.S. Armory at Harper's Ferry, Virginia, relating to expenditures for Permanent Improvements:

EXPENDITURES FOR SERVICES AND LABOR FOR REPAIRS AND IMPROVEMENTS, 1817 to 1821 from First Series Files.

YEAR	Carpenters	Masons (including stone)	Painting and glazing	plastering and lathing	shingling	Millwright work	Total on Labor	Total for Materials (estimated)	Total Labor & Material
(1) 1817	$ 599.95	$ 712.21	$ 334.60	$ 142.75	$ 95.00		$ 1,884.51	$ 7,415.38	$ 9,299.89
1818	576.88	634.00	57.75	119.10	50.94		1,438.67	7,464,90	8,903.57
1819	1,099.27	2,469.16	309.30	86.62	107.99	458.97	4,531.31	9,805.01	14,336.32
1820	902,14	5,987.21	207.08	331.71	39.56	277.47	7,745.17	14,353.85	22,099.02
1821	395.01	649.34	90.72	25.81	48.07	474.74	1,683.69	17,691.12	19,374.81
TOTAL	$ 3,573.25	10,451.92	999.45	705.99	341.56	1,211.18	17,283.35	56,730.26	74,013.61

Figures include work on U.S. Musket Factory, U.S. Arsenals, U.S. Rifle Factory(1819-21), and U.S. Armory Dwelling Houses, July 1,1817 to December 31, 1821. Also included is construction and repair of Armory canals and dams.

(1) 3rd and 4th quarters only of 1817.

U.S.Musket Factory Canal, 1814 - 1821

The Armory Paymaster's vouchers for 1819 reveal that a total of $ 954.25 was expended on the Armory Canal on the Potomac during that year. On November 12, 1819, Thomas Morgan was paid $ 39.00 " for blowing Rock to clear the Potomac Canal and provide a greater supply of water."[1]

The masons Henry James and William McKinny received a total of $ 915.25 in 1819 for "hauling and laying" a total of 523 "perches of stone" in "the wall on the Potomac River to preserve the basin of the Canal.'[2]

The large project for 1820-21 was the rebuilding, for the third time, of the Potomac Dam, which will be discussed in detail on page 45 of this report. The Paymaster's vouchers, however, indicate that the following work was done on the canaL

Record Group No. 217, 2nd Auditors, 1st series:

File No.	Voucher No.	Work on the Armory Canal, 1820:
4490	23	To Peter Cook, Aug. 10, 1820- $ 34.37 for blowing rocks in basin above canal to assure a supply of water for the canal
4490	38	To William Langton, Au.19,1820, $ 16.00 for making tubes to blow rocks.
4490	37	To William Langton, Aug. 29, 1820, $ 6.00 for making tubes to blow rocks.
4490	62	To Thomas Eccles, Sept.2, 1820, for blowing rocks. to assure a supply of water for canal. $ 8.02.
4490	63	To Patrick Hicky, Sept. 2,1820, $ 20.14, for blow rocks to assure supply of water for canal.
4490	12	To Thomas Morgan, July 25,1820, for blowing rock in basin above the canal , $ 16.30.
4490	9	To Thomas Morgan, Dec. 17,1820, $ 10.12, boring holes in rock in basin above Potomac Canal.

A total of $ 110.95 appears to have been expended during 1820 in blowing out rocks in the basin above the canal in order to increase the supply of water flowing into the armory canal. Also under construction in connection with the dam in 1820, were locks and lock gates at the dam.

1. R.G. 217, 1st Series, 2nd Auditor, File 3266, Voucher No. 51.

2. National Archives R.G. 217, 1st Series, File 3132, Voucher 11, dated July 11,1819, $ 525.00 for laying,quarrying and hauling 300 perches of stone; File No. 3266, Voucher No. 86, dated December 14,1819, for $ 390.25, for laying 223 perches of stone in wall.

On June 29, 1821, John McNulty was paid $ 280.00 for" repairing and raising the canal bank 280 yards in length.[3]

Recorded expenditures on the U.S. Musket Factory Canal from 1817 to 1821 were approximately as follows:

Expenditures of Repairs and Improvements, Armory Canal, 1817 - 1821:

Year	Expenditure
1817	0
1818	0
1819	954.25
1820	110.95 (6)
1821	280.00
TOTAL:	$ 1,345.20 (6)

3. Record Group No. 217, 1st Series, File 5208, Voucher 121.

Building a Third Potomac Dam, 1820 - 1821

Chief of Ordnance, Col. Decius Wadsworth inspected the Harper's Ferry Armory in 1817 and reported to the Secretary of War, in part, on October 14,1817:

"..The Armory at Harper's Ferry labours under two principal Difficulties, one is the Want of a Supply of Grindstones and the other a Deficiency of Water at some Seasons of the Year....

The deficiency of Water at Harper's Ferry may be remedied by the building of a new dam across the Potowmac (sic). The present dam was defectively built at first (in 1799-1800) and a considerable unusual Expence is now incurred to keep it in order." [1]

Two years later, on September 30, 1819, Col. Wadsworth requested Superintendent Stubblefield

"to furnish me an Estimate of the probable Expense of building a new Dam on the Potomac to ensure a better Supply of Water to the Armory. In the course of the month of October I expect to be called on for the Estimates for the Ordnance Service in the year 1820, and I wish to provide for the building of a new Dam in the Estimates. [2]

Three weeks later Stubblefield submitted the estimate for the dam, writing:

"Enclosed you will receive the Estimate for building a new dam across the Potomac (Sic) River for the purpose of throwing in a sufficient quantity of Water for the Armory. I am of the opinion that it will take the Ten thousand dollars to make a dam that will withstand the Ice and drift wood which runs down the River in time of high Water. It will be needful to make use of a quantity of Iron for bolts, to secure the timbers to the Rocks, &c, The River is about Eleven hundred feet in width- a temporary dam can be built for much less money but to make every thing permanent it cannot be done for less than that sum..... [3]

Col. Wadsworth's upped Stubblefield's estimate to $ 15,000 and his estimate for 1820 included "For building a dam across the Potomac Harper's Ferry... $ 15,000." [4]

1. HFnHP Reel 13, V. 2,p.172-180.
2. Reel 14, v. 3, p. 225-226.
3. reel 23. Vol. 4, p.319.
4. Reel 20, V. 5, p.319.

On January 25,1820, Wadsworth reported to Secretary of War John C. Calhoun regarding the dam project, writing:

"...The old Dam is much decayed, & a considerable Expense is incurred every Year in repairing it. The Work done every Summer in repairing this Dam is Constantly destroyed in the Floods of the Succeeding Winter. A new Dam is therefore required to be Solidly & permanently built; & it is Contemplated to place a little lower down, So that no interuption may take place in the business of the Armory while the new Dam is building.

Mr. Stubblefield the Superintendent Estimates a Sum of $10,000 to be Sufficient for building a new Dam. My own opinion is that from 12 to 15 Thousand Dollars will be required. The operation ought to be completed in a Single Season, and it is by no means advisable to have the work Stops for want of Funds after it shall have been Commenced. The Dam in Contemplation will not interrupt the navigation of the Potomac." [5]

The appropriation bill containing the money for the new dam did not pass Congress until April 14,1820,so that work on the project did not get underway until the summer of 1820. [6]

On July 22,1820, Col. Wadsworth advised Superintendent Stubblefield:

In the last and present Month I have directed $ 18,000 to be remitted for the Monthly expenses of the Armory, of which $ 14,000 for the Ordinary expenses, $ 2,000 for building a new Dam, and $ 2,000 for Mr. Halls Patent Rifles. Your Estimate for rebuilding the Dam was I think $ 10,000. As I understand from you it will not be completed in the present year, I presume $ 6,000 towards rebuilding the Dam will be as much as you with require this Season.

The Balance will be reserved to complete the Work next year. If you want more than $ 6,000 for rebuilding the Dam this Season you must inform me in Time." [7]

On July 22,1820, Stubblefield entered into a contract with John Lowstetter of Jefferson County to construct 300 feet of the proposed dam at the rate of three dollars for each perch"when the wall shall be completed". (See Appendix No. 1).

5. Reel 19, V.12, p.1197.
6. U.S. Statues at Large,III,p.563.
7. Reel 21, V., p.513.

The contract specified that the "wall in the Potomack River" was to be "Three hundred feet in length & not less than eight feet thick at the bottom nor less than six feet thick at top & to be of the proper height to answer for turning a sufficiency of water into the Canal." The contractor was to quarry and lay the stone used in the dam.[8]

In October 1820, Stubblefield reported to Col. Wadsworth that he had spent about $ 8,000 on the construction of the dam and would probably need an additional $ 500 to complete work this year. He wrote that he had used large stones in the dam rather than timbers as originally proposed, because it had been impossible to get a sufficient supply of timber down the river in time to be used in the construction. The summer of 1820 was a very dry one and with the river at the lowest level ever known, the Superintendent reported that he had pushed the construction further than orginially planned. In October 1820, he announced that the principal part of the new dam was built and stated that it was the most substantial in the United States and perhaps even in the world.[9]

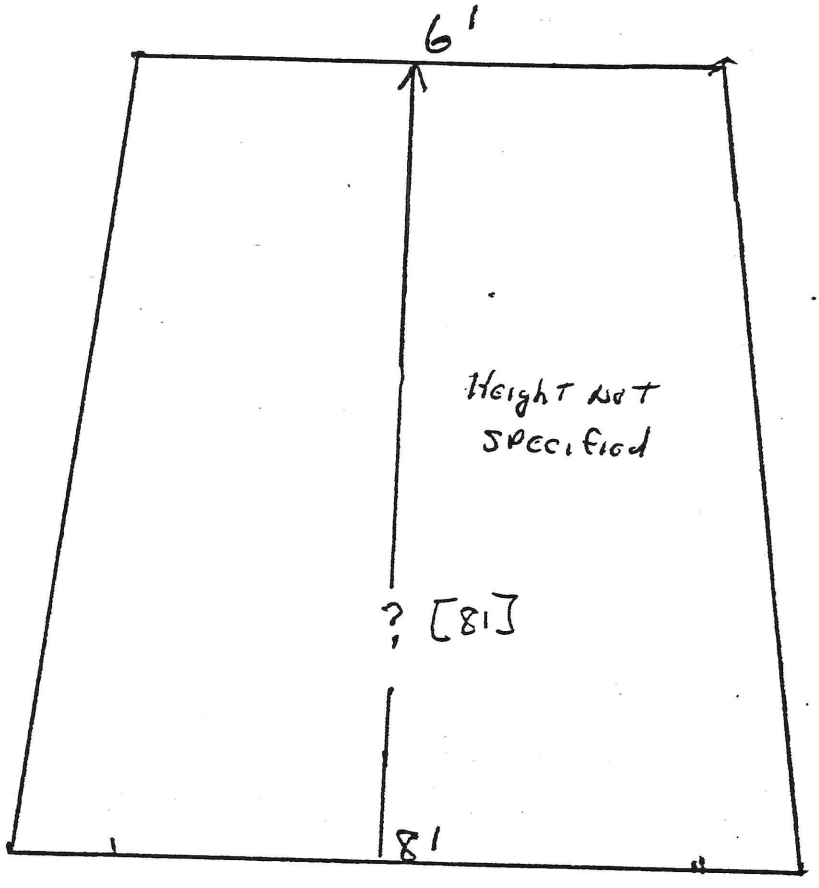
The remaining section of the dam was completed in 1821 by the 1820 contractor. John Lowstetter filed a claim for additional compensation for the work done in 1821, which caused Stubblefield to comment and provide additional information on the nature of the 1821 construction:

> "Some time after he (Lowstetter) had commenced working under the latter contract (a 1821 contract that paid at the same rate as in the 1820 contract), he proposed to me to change the nature of the contract stating that he would prefer doing the work by the job, that is to say he would complete the balance of the Dam for two

8. Reel 21, V.5, pp.516-517.
9. Reel 21, Vol. 4, p.371-372.

Plan of 1820 Dam

300 Feet long



Stones used not to be less than 6 & 8 feet in Length.

2,940 Perches stone used

Contractor – John Lowstetter Paid $ 6,649.00.

Total $11,200.00

July 22, 1820

River said to be 1100 feet wide.

CWSnell 6/81

thousand dollors and have the work all done in the course of the year 1821. I accordingly acceded to his proposal and agreed to give him the above sum thinking at the time that the part of the Dam remaining to be finished would be something less than Seven hundred Perch. But when the work was done I found it would measure nine hundred perch and that Mr. Lowstetter would suffer considerable loss by changing the nature of the contract.

I then agree to pay him by the Perch at the rate which had at first proposed, which was the same price he had received for the part that was built in the year 1820 & which I thought was a fair and equitable price. This made his work (in 1821) amount to $ 2,700 which was seven hundred dollars more than I was bound to pay him agreeable to contract.

Mr. Lowstetter also built a great quantity of stone work in a wall for the support of the Bank of the (Armory) Canal and filled in the bank of the same with gravel &c...."

Stubblefield stated that Lowstetter had executed this work in a "substantial & workmanlike manner," as stated in the contracts and that he had also been paid in accordance with the terms of those contracts. 10

The chart on the following page shows the fiscal record of payment to the contractor John Lowstetter and others who were working on the Potomac dam, lock, and canal in 1820. The vouchers indicate that at least $ 4.967.58 was expended on the project in 1820 and that 2,040 perches of stone were placed on the dam. Of this total of stone, Lowstetter placed 1,299 2/3 perches and was paid $ 3,949.0 for his his work. The vouchers for the payments to Lowstetter for his work on the dam in 1821 are missing from the files. However, if Superintendent Stubblefield's statement in his letter quoted above is correct, Lowstetter was paid $ 2,700.00 for laying 900 perches of stone on the dam thus bringing the total payments made to him, to $ 6,649.00 and the total of stone placed on the dam to about 2,940 perches. The vouchers and Stubblefield's letter suggests that the cost of rebuilding the Potomac Dam in 1820-21 probably did not exceed $ 11,200.

10. Reel 21, Vol. 5, pp. 513-515.

Rebuilding Potomac Dam, 1820-

Record Group 217:

File No.	Voucher No.	
4490	87	To John Lowstetter Sept. 30,1820-$ 3,000.00, for building 1,000 perches of stone wall on the Potomac Dam.
4490	41	To. John Lowstetter, Nov.4,1820, $ 550.00 for 166 2/3 perches of stone work on the dam, with 500 square yards of embankment and 200 bushels of lime.
4591	9	To John Lowstetter, Dec.27,1820. $ 399.00 for building 133 perches of stone work on the Potomac Dam.:
Subtotal	1821:	To John Lowsteller, $ 3,949.00 for 1,299 2/3 perches of stone wall on dam and 500 cubic yards of embankment.
4490	40	To Edward Harding, Nov. 4,1820,$ 300.00 for laying up 600¼ perches of stone wall on the dam and lock
4490	45	To Hiram Kerney, Nov.7,1820-$ 70.00 for laying 140 perch of stone wall on the dam.
4490	52	To William McKinney,Nov.17,1820. $ 386.00 for quarrying 772 perches of large stone for the Potomac Dam.
4490	81	Sept.28,1820- $ 33.75 for use of cart and wagons,10 days, hauling rocks to the dam.
4591	24	To William McKinney, Dec. 28,1820, $ 57.00 for 38 days work laying stone on the dam and lock walls.
4591	37	To William Park, Dec. 30,1820, $ 32.88 for boring 3,288 inches in rocks laid on the dam.
4591	38	To Thomas Morgan, Dec. 30,1820, $ 16.08 for boring 1,608 inches in rock to be laid on the dam.
4951	46	To John Upperman. December 30,1820, $ 79.50, for 53 days Carpenter work making the lock gates.
4830	3	To Henry James, mason, Jan.4,1821, $ 53.37 for 30½ days dressing rock for locks and repairing the furnance.
TOTAL,	1820	$ 4,977.58 for 2,040 perches of stone, 500 cu.yds.embankment.
1821		$ 2,700.00 900 perches of stone, apparently paid to John Lowstetter in 1821.
Approximate Total:		
1820-1		$ 7,677.58 2,940 perches of stone.

Record Group 217- Second Auditor's Records, 1st Series:

File No.	Voucher No.	Rebuilding Potomac Dam ,1820 Laborers
4490	36	To Thomas Morgan, August 17,1820, $ 29.50 for boring holes in rock for Potomac Dam.
4490	17	To Thomas Morgan, October 20,1820, $ 130.00 for quarrying 325 perches of stone to build locks at head of canal for the dam across the Potomac.
4490	25	To Jonathan Kauffman, Aug. 17, 1820, $ 10.00-for 10 days labor.
4490	13	James McLaughlin, July 25,1820, $ 11.83, for boring holes in rock
4490	14	Patrick Hicky, July 25,1820, $ 13.22,boring holes in rock.
4490	36	Thomas May, Aug. 17,1820,$ 29.50, boring holes in rock.
4490	37	Riche Lewis, Aug.19,1820, $ 21.12, boring holes in rock.
4490	59	Sampson Blackbem. Aug.19,1820. $ 5.68, boring holes in rock.
4490	60	James McLoughlin, Aug. 20,1820, $ 23.16, boring holes in rock.
4490	42	Hugh McCollogin, Aug.19,1820, $ 14.40, boring holes in rock.
4490	44	Osburn Strider, Aug.21,1820, $ 30.64 for boring holes in rock.
4490	82	To ? $ 42.70 for boring holes in rocks.
4591	27	To Francis Moore December 29,1820, $ 3.00 for two locust poles for lock gates on canal.
		Rebuilding Potomac Dam, 1821
4830	68	To Henry James, March 10,1821, $ 34.12 for 19½ days dressing stones for lock gates and furnace repair.
5208	4	To Henry James, April 26,1821, $ 36.75, for laying stones, 21 days work.

1820: 307.75

1821: 70.87

1820-21 $ 378.62

Total: $ 8, 113.20. (Recorded costs identified).

In his "Statement of the estimated value of the United States Armory at Harper's Ferry, Virginia, on the 31st of December, 1821," Lieutenant Colonel George Bomford, Chief of the Ordnance Office, assigned the following values to the physical plant of the armory:

For 1,890 acres of land, including the ferry across the Shenandoah.....	$ 42,877.28
For 113 buildings.....	150,650.00
For mill-dams, canals, bridges, and other permanent improvements.....	105,000.00
Total Estimated Value of Physical Plant:	$ 298,527.28 (11)

Section of Armory	No. of Bldgs.	Value of Buildings
U.S. Musket Factory	16	$ 71,150.00
Hall Island Workshops (Rifle Factory)	4	11,500.00
Arsenals & Timber Shed, Arsenal Square	3	20,250.00
Powder Magazine, Camp Hill	1	150.00
Stable, Shenandoah Street	1	250.00
Working Plant of Armory:	25	$ 103,300.00
Armory Dwelling Houses	86	46,550.00
School Houses	2	800.00
GRAND TOTAL OF BUILDINGS:	113	$ 150,650.00

11. American State Papers, Military Affairs, Vol. II, p.482. The report was dated November 30, 1822.

D.

Statement of the expenditures at the United States' Armory at Harper's Ferry, Va., and of the arms made and repaired therein, from its establishment to the close of the year 1821.

Year.	AMOUNT EXPENDED. For land.	Buildings, mill-dams, canals, and other permanent improvements.	Repairs of buildings, mill-dams, &c.	Total for land, buildings, &c.	For the manufacture and repair of arms.	Miscellaneous expenses not included in the foregoing.	Total amount expended.	ARMS MADE AND REPAIRED. MADE. Muskets.	Rifles.	Pistols.	Pattern muskets.	Pattern rifles.	Pattern pistols.	Wall pieces.	Harpoon guns.	Torpedo locks.	Torpedo lock boxes	Cannon locks.	Ball screws.	Screw-drivers.	Bullet moulds.	Wipers.	Rifle charges.	Spring vices.	REPAIRED. Muskets.	Rifles & carbines.	Pistols & swords.	Value of repaired arms in new muskets.	Total value of arms made and repaired, estimated in new muskets.
1796	7,016 66	-	-	$7,016 66	-	-	$7,016 66																						
1797	10,000 00	-	-	10,000 00	-	-	10,000 00																						
1798	-	$3,028 53	-	3,028 53	$1,092 17	$247 73	4,368 43																						
1799	-	14,565 00	-	14,565 00	9,520 49	-	24,085 49																						
1800	-	19,552 33	$505 81	20,058 14	11,397 12	-	31,455 26																						
1801	-	6,558 20	728 69	7,286 89	19,914 92	-	27,201 81	293																					
1802	-	4,698 92	1,512 97	6,211 89	23,222 44	-	29,434 33	1,472																					
1803	-	4,905 13	1,715 32	6,620 45	22,076 95	-	28,697 40	1,018																					
1804	-	4,159 25	2,624 56	6,783 81	24,529 90	-	31,313 71	156	772	-	4	4	-	-	-	-	-	-	772	-	772	772	772						
1805	-	2,696 15	2,117 34	4,813 49	26,448 68	-	31,262 17	-	1,716	-	-	-	-	-	-	-	-	-	1,716	-	1,716	1,716	1,716						
1806	-	12,329 20	1,856 43	14,185 63	26,869 49	853 68	41,908 80	136	1,381	-	-	-	8	-	-	-	-	-	1,381	-	1,381	1,381	1,381						
1807	-	8,513 50	1,581 16	10,127 66	29,365 62	1,138 00	40,631 28	50	146	2,880	-	-	-	1	-	-	-	-	146	-	146	146	146	-	5,500				
1808	-	40,655 32	2,356 87	43,012 19	60,726 44	1,214 00	104,952 63	3,051	-	1,208	-	-	-	6	-	-	-	-	-	-	-	-	-	-					
1809	-	37,231 26	2,732 21	39,963 47	117,764 31	1,107 35	158,835 13	7,348	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	590				
1810	-	14,193 90	2,486 55	16,679 45	126,362 85	2,000 00	145,042 30	9,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	691				
1811	-	9,125 06	3,048 36	12,173 42	124,957 17	2,575 00	139,707 59	10,000	-	-	-	-	-	-	4	-	-	-	-	-	-	-	-	-	1,392				
1812	-	11,032 48	2,732 58	13,765 06	131,156 78	16,850 17	161,772 01	10,200	-	-	-	-	4	-	-	-	-	-	-	-	-	-	-	-	2,113	531	581		
1813	20,862 62	10,560 83	3,028 35	34,449 80	168,761 20	1,313 60	204,524 60	9,000	-	-	5	4	-	-	-	40	25	-	-	-	-	-	-	-	612	231			
1814	-	1,681 23	3,755 91	5,437 14	131,696 02	6,877 65	144,010 81	10,400	1,600	-	-	-	-	-	-	-	-	-	1,600	-	1,600	1,600	1,600	-	548	16			
1815	-	-	3,244 72	3,244 72	113,616 10	8,475 00	125,335 82	5,340	1,508	-	-	-	-	-	-	-	-	-	1,508	-	1,508	1,508	1,508	-	23	2			
1816	-	2,984 12	4,758 88	7,743 00	217,043 87	2,500 00	227,286 87	6,416	2,052	-	5	-	-	-	-	-	-	-	2,052	-	2,052	2,052	2,052						
1817	-	4,939 64	4,360 25	9,299 89	157,113 39	4,486 94	170,900 22	8,513	2,726	-	6	-	-	-	-	-	6	-	2,726	-	2,726	2,726	2,726						
1818	5,000 00	4,563 24	4,340 33	13,903 57	171,921 80	7,109 37	193,024 74	9,892	2,700	-	8	9	-	-	-	-	-	-	2,700	6,750	2,700	2,700	2,700						
1819	-	9,554 05	4,782 27	14,336 32	162,079 14	2,600 00	179,015 46	7,020	3,324	-	2	2	6	-	-	-	-	-	3,324	12,500	3,324	3,324	3,324						
1820	-	16,931 50	5,161 52	22,099 02	152,589 00	1,500 00	176,188 02	9,856	1,793	-	-	-	-	-	-	-	-	-	1,793	10,000	1,793	1,793	1,793	3,768					
1821	-	12,018 57	7,356 24	19,374 81	141,263 00	2,500 00	163,137 81	10,320	-	-	-	-	-	-	-	-	-	-	-	8,500	-	-	-	2,266					
Tot.	12,877 28	256,509 41	66,793 32	366,180 01	2,171,490 85	63,438 49	2,601,109 35	119,911	19,718	4,088	30	19	18	7	4	40	25	6	19,718	37,750	19,718	19,718	19,718	6,034	11,469	780	581	3,208	151,550

Remarks.—In some of the years the expenditures and products of the armory appear to be disproportionate. This has arisen partly by the purchase of a greater or less quantity of stock and materials in a year than was consumed within it, and partly by the payments of debts in one year which had been contracted in the year preceding.

Note.—The item of "Miscellaneous expenses" is for disbursements made at the armory for purposes not connected with the product of the establishment, viz:

Amount paid for the transportation of arms,	$21,568 44
Amount paid the workmen employed in the arsenals in cleaning and preserving the arms,	11,750 00
Cost of arm chests for packing 120,000 stands of arms,	18,000 00
Value of parts of work and tools sent to distant arsenals for repairing arms,	12,120 05
	$63,438 49

ORDNANCE DEPARTMENT, *November* 30, 1822.

G. BOMFORD,
Lieut. Col. on ordnance duty.

CHAPTER VI

THE U.S. MUSKET FACTORY, 1822 to 1829

The annual reports for the years 1822 to 1829 reveal that a total of $ 85,240.67 was expended for construction and repair and that a total of 59 buildings were erected for the Armory(exclusive of Hall's Rifle Factory) during those years. A closer analysis of these reports ,however, indicates that only 35 of the new structures were actually new buildings and the remaining 24 new edifices were additions that were made to older structures. Thus the total number of Armory building on December 31,1829, was about 148 structures and not 172 buildings, as it might appear if one added the reported 59 new structures to the 113 edifices extant in 1821. No major or large workshops were erected at the Musket Factory during the years 1822 to 1829.

Expenditures for Construction and Repair,1822 to 1829, were as follows: Armory (1)

Year	New Construction	Repair	New Struct.	New Bldgs.	No. of Workmen	No.of Arms
1822	$ 5,134.75	$ 350.00	6	6	237	10,000
1823	11,037.80	0	5	5	253	12,200
1824	16,271.96	0	17	7	280	11,559
1825	4,101.50	2,171.50	4	2	272	14,000
1826	9,847.66	431.97	4	3	221	8,720
1827	7,550.87	1,519.87	9	1	239	13,020
1828	6,533.00	5,500.00	7	6	217	10,000
1829	14,631.82	157.33	7	5	205	8,895
1822-29	$75,109.36	$ 10,130.67	59	35	-	88,394
1796-1829:	$ 331,618.77	$ 76,885.89		148	-	233,111

1. Congressional Serial Nos. 80, Document No. 69 for 1822; Serial 98, Document 121, for 1823; Serial No. 116, Document No. 80 for 1824; Serial No. 135, Doc. 37 for 1825; Serial No. 152, Document No. 99 for 1826; Serial No. 173, Doc. No. 185 for 1827; Serial No. 187,Doc. No. 139 for 1828; Serial No. 197, Doc. No.84 for 1829; Number of armorer from American State Papers,Military Affairs, V, p.915.

National Armory Accounts for the Years 1822 to 1829 show that the construction and repairs funds were expended on buildings, canals, and dams at the U.S. Armory at Harper's Ferry as follows:[2]

For PERMANENT IMPROVEMENTS AT THE ARMORY				
Year	For Buildings	For Dams and Canals	No. Bldg	Armory Total
1822	$ 2,800.00	$ 2,684.75	6	$ 5,484.75
1823	8,758.30	2,279.50	5	11,037.80
1824	15,87196*	400.00	17	16,271.96
1825	5,411.50	861.50	4	6,273.00
1826	5,199.91	4,229.72	4	9,429.63
1827	4,880.00	1,519.87	9	6,399.87
1828	3,400.00	6,633.00	7	10,033.00
1829	7,785.20	7,003.95	7	14,789.15
Total:	$ 54,106.87 *	$ 25,612.29	59	$ 79,719.16

*Includes $ 5,000.00 spent to rebuilt workshop damaged in fire of May 1824.

Value of Plant in 1821 and 1829:

ARMORY	1821	1829
Number of buildings	113	172
Value of Buildings	$ 150.650.00	$ 199,756.87**
Value of Canals, dams	$ 105,000.00	$ 130,612.29
Value of Plant:	$ 255,650.00	$ 330,369.16
Value of Machinery	$ 72,247.44	$ 76,248.44
Value of Land, 1,890 acres	42,877.28	$ 42,877.28
TOTAL:	$ 370,774.72	$ 449,494.88

(2) National Archives R.G. 156, Entry 935. ** this total, 1829, has had $ 5,000.00 deducted from it as the cost of replacing the work shop damaged in the fire of 1824.

An analysis of the construction program of the Armory for the period 1822 to 1829 reveals that a grand total of $ 83,720.16 was expended on the following projects (see Chart No. 3, page 56)

For erecting new workshops and store houses.....	$ 12,341.23
For repairing workshops and arsenals.....	9,424.74
For acquiring building materials.....	4,307.56
For the purchase and making of new machinery	10,038.77
For the construction and improvement of dwelling houses..	25,495.01
For the making and laying of water pipes for fire protection and for digging wells.....	693.21
For constructing and turnpiking roads, paving sidewalks, and constructing one bridge.....	2,118.82
For constructing river walls.....	2,869.30
For the improvement and repair of dams and canals.....	16,431.52
Total, 1822 - 1829:	$ 83,720.16

Approximately $ 16, 969.64 was expended on the construction of 32 new building (See Chart 4, p. 57) as follows:

For erecting five new workshops.....	$ 5,527.68	
For building six store houses.....	4,150.00	
For constructing two office buildings		700.00
Subtotal, Armory plant- 13 buildings:	$ 10,377.68	
For constructing 19 new dwellings houses.....		5,547.76
Total:, 32 new structures.....	$ 15,925.44	
For making additions to 35 extant dwellings		8,394.16
Total: Work on 67 buildings	$ 24,319.50.	

CHART No. 3

Construction and Repair Program, Armory, 1822-29 (Entry 935)

YEAR	Construction Shops	Repair Shops	Bldg. Walls	Roads & Bridges	Dwelling Houses	Dams & Canals	Bldg. Materials	Machinery	Water Pipes	TOTAL
1822	$ 2,000.00	350.00	100.00	-	600.00	2,434.75	-	-	-	$ 5,484.75
1823	200.00				8,558.30	2,279.50				11,037.80
1824	500.00	5,000.00	400.00		5,371.96			5,000.00		16,271.96
1825	-	1,520.00	350.00		3,881.50	521.50				6,273.00
1826	794.77	1,746.20	1,427.80		1,172.75	165.54	3,393.37	1,087.77	491.43	10,279.63
1827	2,700.00		200.00	1,419.87	1,980.00	100.00		1,151.00		7,550.87
1828	1,650.00		300.00	333.00	1,450.00	5,500.00		2,800.00		12,033.00
1829	4,496.46	808.54	91.50	365.95	2,480.50	5,430.23	911.19		201.78	14,789.15
TOTAL	12,341.23	9,424.74	2,869.30	2,118.82	25,495.01	16,431.52	4,307.56	10,038.77	693.21	83,720.16
Hall"s Rifle Shop, 1822-29										17,699.28
GRAND TOTAL									$	101,419.44

Ordnance Department Reports, 1822-29, indicate that a total of $ 85,240.67 was expended for repair and improvement at the Harper's Ferry Armory during this period. The above chart, also based on Ordnance Department records and accounts, shows how $ 83,720.16 of the total was spent.

CHART NO. 4

National Archives Record Group No. 217- Records of the United States General Accounting Office, Washington, D.C. Records of Second Auditor: Reccords and Accounts from the Paymaster of the U.S. Armory at Harper's Ferry, Virginia, relating to expenditures for Permanent Improvements:

EXPENDITURES FOR SERVICES AND LABOR FOR REPAIRS AND IMPROVEMENTS, 1822 to 1829:

	YEAR	Carpenters	Masons (including stone)	Painting and glazing	plastering and lathing	shingling and slating	Millwright work	Total on Labor	Total Labor & Material
	1822	579.00	4,771.22	271.50	264.85	4.00	539.93	6,430.50	5,484.75
	1823	1,171.44	3,196.60	157.43	213.23	134.93	549.37	5,423.10	11,037.80
	1824	1,366.48	1,693.27	433.53	169.43	52.00	760.86	4,475.57	16,271.96
	1825	1,706.90	1,396.00	319.97	263.61	1,008.71 *	497.75	5,192.94	6,273.00
	1826	373.75	3,257.38	184.18	131.48	1,467.00	1,433.70	6,847.49	10,279.63
(2)	1827	1,137.71	5,297.84	197.31	344.64	380.20	80.00	7,437.70	7.550.87
(3)	1828	419.74	1,087.61	59.96	87.50	126.55		1,781.36	12,033.00
	1829	3,271.22	6,943.38	655.79	307.45	608.96		11,786.80	14,789.15
	TOTAL	10,026.24	27,643.30	2,279.67	1,782.19	3,782.35	3,861.61	49,375.36	83,7[illegible]

Includes work on U.S. Musket Factory, U.S. Rifle Factory, and U.S. Arsenal Square buildings, also Armory Dwelling Houses, and canals and dams.

* First slating of roofs at Armory.

Paid to workmen for repairs and improvements they made to Armory Houses, $ 9,776.51.

(2) 1st quarter of 1827 missing.
(3) 1st and 2nd quarters of 1828 missing.

Repair and Improvement at the U.S. Musket Factory, 1822 -1829:

The annual reports prepared by the Ordnance Department during the years 1822 to 1829 indicate that the following repairs and improvements were made at the U.S. Musket Factory during that period.

Of the total of $ 4,484.75 expended for construction and repair in in 1822, $ 750.00 was spent for work at the musket factory: $ 400.00 for construction and $ 350.00 for "Repairing three Work Shops."[1] The new construction included erecting "3 sheds over the principal water wheels for the purpose of Keeping stoves to prevent freezing" at a cost of $ 150.00 . The new sheds probably covered the wooden water wheels at finishing or turning shop (Our Bldg. No. 2 on the 1821 list, see p.39); the boring mill (our Bldg. No. 3), and the stocking shop (Our Bldg. No. 5 on the 1821 list). "A Stone wall for erecting a Shed over the annealing Furnace" was also constructed at a cost of $ 100.00.

Finally, one new building, " 1 Shop for turning and tempering Lock Springs" was built at a cost of $ 150.00.[2] The price suggests that a small shop may have been erected. On August 24,1822, Robert Painter was paid $ 100.00 for mason work: "Quarrying and laying 80 perches of stone in a building."[3] Most of the $ 350.00 spent for making repairs to three shops probably went to the millwright and dam builder John Lowstetter who received $ 330.62 for the following work in 1822:

1."Statement of the expenditures at the Y U.S. Armory Harper's Ferr, Va., and of the Arms &c., made therein during the year 1822." National Archives R.G. 156, Entry 935, Washington,D.C. Photostatic copies of orginals in Harpers FERRY NHP Collections. Hereafter referred to as Statement for Year 1822,etc."
2. Statement for 1822.
3. National Archives R.G. 217, Records of the 2nd Auditor, 1st Series, File 6410-Voucher No. 27C.

N.A. Record Group 217 1822

Date	Payment	Work Done (4)	File No.	Voucher No.
May 11	$ 42.00	for making two drum wheels for the polishing shop,each 7 feet long.	6274	C25
June 11	137.37	for 78½ days work making a water wheel for the forge hammer and repairing a water wheel of grinding mill.(Located at Rifle Factory).	6274	C59
June 29	151.25	For building 22 square of a forebay	6274	C87
Total:	$ 330.62	(4) To John Lowstetter in 1822		

Of the $ 11,037.80 expended by the Armory for construction and repair during 1823, only $ 200.00 was spent for work at the Musket Factory: this went for "Building a House for annealing Gun Barrels."[5] This workshop may have have been constructed by the mason Edward Harding and the carpenter Samuel Howington. On June 30, 1823, Howington received $ 25.00 for "25 days work fitting up a small shop."[6] Also on June 30,1823, Edward Harding was paid $ 180.00 "for laying 80 perches of stone in a building."[7]

Of the $ 16,271.96 expended for repair and improvement by the Armory in 1824, $ 10,000.00 went for repair at the U.S. Musket Factory. No new buildings were erected at the Musket Factory during the year. In May 1824, a fire swept through one of the large brick Musket Factory workshops, probably the turning or finishing shop(Our Bldg. No. 2 on the 1821 list, see p. 39), completely destroying the machinery, but leaving the ruined brick walls standing.

4. Lowstetter was also paid an additional $ 43.94 on October 30,1822, "for 26 days millwright work, repairing forebay.", R.G. 217, 1st Series, File 6606, Voucher C11.

5. Statement of Expenditures for Year 1823.

6. R.G. 217, 1st Series, File 7207, Voucher 98A.

7. T R.G. 217- 1st Series, File 7207, Voucher 104A. On Sept.30,1823 the mason John Lackey was also paid $ 69.00 "for laying 69 perches of stone in a bin over the annealing furnace.: File 7356, Voucher 76A.

Superintendent James Stubblefield imformed the Ordnance Department of this disaster on May 8, 1824, writing:

> I am sorry to inform you that we have had a very destructive fire, which terminated in the loss of one of the principal workshops. The fire was discovered about 2 o'clock this morning in a small shop attached to the building appropriated as a polishing & finishing shop in which was a great portion of our machinery, & before the (fire) engines could be brought to bear the flames had reached the roof of the large building. It then became necessary to use our greatest exertions to save the adjoining buildings which we were fortunate to succeed in.... The walls of the building are very little injured & I shall make arrangements to have it fitted up with the least possible delay which will not cost more than from three to five thousand Dollars. The loss of Machinery & Tools has however been considerable and will very much impede the operations of the armory until they can be replaced." [8]

Col. Bomford, Chief of Ordnance, at once authorized the superintendent to rebuilt the workshop and suggested that a fire wall be constructed in the middle, which would also extend above the roof. [9]

By the end of the month, on May 27, Stubblefield reported: The

> workshop which we are about rebuilding will be ready in a few days to receive the roof.... I....propose making the roof fire proof with either copper, slate or tin which you might think most advisable...
>
> The repairing of the building and machinery will not cost more than about Five thousand dollars, the most important parts of the machinery were of cast Iron and are not injured by the fire... I expect to have everything in full operation by the 10th or 15th of next month." [10]

Bomford directed that copper roofing not be used because this would be too expensive and recommended that a tin roof be placed on the reconstructed shop. [11]

8. Harpers Ferry NHP Reel 21, Vol. 5, pp.423-424.
9. Reel 14, Vol. 4, p. 386.
10. Reel 21, Vol. 7, p. 741.
11. Reel 14, Vol. 4, p. 392-393.

The total cost "For Rebuilding the large workshop and making new machinery in the same" in 1824 was reported to be " $ 10,000.00."[12]

The Armory spent $ 6,273.00 on repair and improvement in 1825 and none of this money went for work on Musket Factory buildings, with the possible exception of $ 1,520.00 expended "for Slating the Roofs of the public buildings."[13]

The work on the roofs was done by Anthony Preston, the slater, and probably the carpenter William Bateman during the first half of 1825.

Preston received a total of $ 916.42 "for furnishing slate and slating" a total of 85 squares "on the roofs of the public buildings."[14] Bateman was paid a total of $ 492.70 for the follow work:

Date	Payment	Description of work	File No.	Voucher No.
April 7	$ 40.00	for 25 days work removing shingles from the roof of a public building and sheathing it to receive slate.	9057	13A
April 27	335.60	for 209 3/4 days of carpenter work(with journeymen carpenters) making repairs to public building.	9057	69A
Sept.25	122 10	removing old roof and nailing 22 squares and 60 feet of new shingles on the grinding mill- 57 days of work by team.	9310	129A
Total:	$ 492.70	William Bateman, 1825.		

David Westerfield also earned $ 25.00 on March 8, 1825 "for ripping 20,000 shingles off a public buildings."[15]

Also probably included in the $ 1,520.00 listed as expended for slating, was the following work": On March 9, 1825 the carpenter John Markell (or Markle) was paid $ 151.77 "for furnishing the material and building a cupola on one of the public

12. Statement of Expenditures for 1824.
13. Statement of Expenditures for 1825.
14. R.G. 217-1st Series, File 9057, Voucher 45A, April 20,1825, for $ 472.50-45 squares; File 9310, Voucher 58A, for $ 443.92= August 26,1825 for 40 squares.
15. R.G. 217, 1st Series, File 9057, Voucher 97A.

"workshops and hanging a bell therein."[16] This belfry, a new architectural feature on the Armory buildings, was probably erected on the rebuilt roof of the fire damaged turning or finishing shop(Our Bldg. No. 2 on 1821 list, see page 39). This shop was henceforth to be generally referred to as "the Bell Shop". This work also suggests that new roof of Bldg. No. 2 may have been covered with slate in 1825 after the new cupola had been installed.

The Armory spent a total of $ 10,279.63 for repair and improvement in 1826.[17] Included in this figure was $ 3,392.37 expended for the purchase of various building materials and also $ 995.00 spent for making machinery. Another $ 339.20 was spent for "repair of buildings." $ 1,407 went "for Slating 2 Arsenals and one work shop," the last item being located at the Musket Factory and the first two structures on Arsenal Square.[18] The slater Anthony Preston was paid the $ 1,407.00 on March 31, 1826 " for furnishing the slate and Putting on the slate, 134 squares, on the public arsenals and one workshop, at $ 10.50 per square."[19] It should also be noted that Samuel Strider was paid $ 60.00 on April 24, 1826 "for transporting 12 tons of slate from Georgetown, D.C., to Harper's Ferry."[20]

The total utilized for new construction at the Musket Factory in 1826 came to $ 939.07 and resulted in the construction of three buildings and a flood guard wall. The annual report for 1826 indicated that $ 481.42 was spent "for building 1 new shop for draw grinding."[21] This structure was probably constructed by the mason Daniel A. Weed, who received $ 400.00 on October 30, 1826 for"erecting the wall of a building 18 by 27 feet, two stories. He finished the lime and 155 perches stone, charging $ 193.75. Digging the cellar, 45 cubic yards of earth excavated, came to $ 9.00, and the cost of timber, plank, and other material amounted to $ 197.25.[22]

16. R.G. 217, 1st Series, File 9057, Voucher no. 103A.
17. Statement of Expenditures for 1826.
18. Ibid.
19. R.G. 217, 1st Series, File 9851, Voucher 122A.
20. R.G. 217, 1st S., File 10053, Voucher 1A.
21. Statement of Expenditures for 1826.
22. R.G. 217, 1st Series, File 10559, Voucher No. 12.

On March 25, 1826, the mason William McKinny was also paid $ 78.50 "for laying 145½ perches of stone in a wall under the forebay at the grinding mill."[23]

The mason Philip Coons received the balance of $ 457.65 for constructing the following two buildings and wall in 1826.

"For laying 295½ perches of stone for Coal House. ----$ 202.35."[24]

" For laying 148 perches of stone for annealing house- 111.00 "[25]

This was a shop for annealing, case hardening, and tempering ramrods.

The coal house and annealing shop were completed by August 19, 1826.

Finally, "For Building a guard wall above the Shops- -----$ 144.30."[26]

Coons was paid $ 144.30 on March 31, 1826 for "quarrying, haulingm and laying 260½ perches of stone in the wall above the workshops on the Potomac."[27]

During 1827 a total of $ 7,550.87 was reported to have been spent on repair and improvement at the Armory. Of this sum $ 1,151.00 went to pay for making or purchasing machinery that would be used at the Musket Factory,[28] and additional $ 1,200 to erect a new work shop on the Potomac. The annual report described the new building as "a shop for the new half-stocking machinery, 20 by 30 feet, brick, 2 stories," cost $ 1,200.00.[29]

The Armory Paymaster's vouchers reveal that the following men constructed the new brick workshop:

23. R.G. 217, 1st Series, File 9851, Voucher 44A.
24. Statement of Expenditures for 1826; R.G. 217- 1st Series, File 10604-Voucher 1A, to Philip Coons, Aug.19,1826 for $ 191.10 "for quarrying, hauling, and laying 273 perches of stone in a building for the Coal House.
25. Statement of Expenditures for 1826; R.G. 217, 1st Series, File 10604, Voucher 1A, to Philip Coons, August 19,1826 for $ 111.00 "for quarrying, hauling, and laying 148 perches of stone in a building for annealing, casehardening and tempering ramrods."
26. Statement of Expenditures for 1826; R.G. 217, 1st Series, File
27. R.G. 217, 1st Series, File 9851, Voucher 88A.
28. State of Expenditures for 1827: "For the purchase of a set of half-stocking machinery- half paid for -$ 800.00" and $ 351 "Amount paid to T. Copeland for making machinery."
29. Statement of Expenditures for 1827.

1827 Construction of Shop for half-stocking machinery R.G. 217

Date	Paid.	Builder	Service rendered	File	Voucher
Oct.18	$ 39.00	Philip Strider	"For 6,000 brick for use in new shop for half stocking machinery.	12013	15B
Oct.27	175.50	Philip Strider	For 40,000 bricks.	12013	40A
Nov 8	31.87	Hirm Carney	"For 16 days work laying brick for the building for the half stocking machinery."	12013	66A
Nov.6	34.20	Absolom VanVactor	"For 19 days laying brick in the building for the new half stocking machinery."	12013	59A
Oct. 16	100.00	George Rolls	"For 16,667 brick to erect a shop for the new half-stocking mach."	12,013	4
Nov.7	263.00	Edward Harding	"For 320 perches and 24 feet of stone laid at grinding mill(at rifle factory) and the building for the use of the machinery for half-stocking."	12013	60A
Nov2.	28.00	John Lackey	"For quarrying and laying 6 1/3 perches of stone for new foundation of shop for half-stocking machinery and also tail race for same."	12013	49A
Dec.5	96.62	Michael Walsh	"For hauling and laying 34 perches of stone in tail race for the half stocking shop, also laying 8 perches of stone for shop, quarrying, hauling and laying 50½ perches of stone work.	12013	88A
Dec.21,	24.31	Patrick Landrgon	"For quarrying 97½ perches of stone for tail race of new stock machinery shop."	12013	113B
Nov.7	80.00	Horace Crossman	"For 40 days work putting up machinery to the half stocking shop.	12013	58A
Nov. 7	68.47	Leonard Cutler	"For helping to put up the machinery for the half stocking shop.	12013	62A
Recorded Total:	$ 940.97		Shop for Half-Stocking Machinery, 1827.		

Total: $ 1,200.00 for structure and $ 800.00 for machinery = $ 2,000.00 in 1827.

The Shop for the Half Stocking Machinery may be the lower two-story building with shed that is attached to the upper or western end of the Stocking Shop, Bldg. No. 5 on Map No. 4(1834), p.122. See Photo No. 1, page 76.

The annual report for 1828 indicates that a total of $ 12,033.00 was spent for repair and improvement at the armory in 1828.[30] Of this amount, $ 2,800.00 went for machinery: $ 2,000.00 for "New Machinery for turning and milling component parts of Arms," and " 800.00 for Forebay, water wheel and fixtures for the half stocking machinery" that had been acquired and half paid for in 1827.[31] Total cost of the shop for half stocking machinery, 1827-28, including $ 1,600.00 for machinery, was thus $ 2,800.00. In 1828 a total of $ 1,450.00 was spent on the construction of three new buildings at the Musket Factory and an additional $ 300.00 was expended for " building a stone partition wall between the U.States lands and lands of Wager heirs."[32]

The three buildings erected or started at the U.S. Musket Factory in 1828 were as follows:

" $ 200.00 for building a stone stone watch house", which was probably located at the Musket Factory.[33] The Armory Paymaster's vouchers for the first and second quarters of 1828 are missing from the National Archives Record Group 217 files, but on October 30, 1828, the mason Edward Harding , who had probably erected the stone watch house, was paid $ 34.50 "for 16 days work in paving watch house and putting up a stone wall at the Supt.'s house."[34]

30. Statement of expenditures for 1828.
31. Ibid.
32. Ibid.
33. Ibid.
34. R.G. 217, 1st Series, File 12579, Voucher 45A.

The second structure, built at a cost of $ 750.00, was "a wooden charcoal house."[35] The storehouse appears to have been constructed during the period January 1 - June 30,1828, as the extant Paymaster's vouchers for the 3rd and 4th quarters of 1828 contain no reference to the erection of the charcoal house.

Construction on a third structure at the Musket Factory was also started in 1828, the annual report noting that $ 500.00 was the "Amount expended towards erecting a new trip hammer Shop."[36] On January 30,1829 Samuel K. White was paid $ 214.87 "for quarry 573 perches of stone for putting up a tilt hammer shop at the armory."[37] This stone was being used to construct the foundations of the new shop and the foundations also formed a part of the north wall of the Musket Factory canal.

Although not mentioned in the 1828 report, the mason James Boden was paid $ 71.37 on November 15, 1828, "for rough casting the [stone] walls of the annealing shop, half turning shop, and coal house, amounting to 571 square yards, at 12½ cents per yard ."[38] These three stone buildings had been erected at the Musket Factory in 1826.

As has been mentioned, $ 300.00 was also expended in 1828 to erect a stone wall along the south bank of the Musket Factory canal opposite to the Wager Six Acre Reservation, and thereby hangs a tale.

35. Statement of Expenditures for 1828.
36. Ibid.,
37. R.G. 217-1st Series, File 12908, Voucher 72A.
38. R.G. 217, 1st Series, File 12579, Voucher 47A,

Boundary dispute with the Wager Heirs

In 1822, Catherine Wager, the widow of John Wager, Jr., claimed that the stone wall on the east side of Arsenal Square then being built by Superintendent James Stubblefield, enclosed a portion of the Wager Ferry tract and she also asserted that the U.S. Canal, which ran between the Wager Six Acre Reservation and the U.S. Musket Factory southern line of workshops, infringed upon the Wager Six Acre Reservation.[1]

In an effort to settle the dispute, Mrs. Wager selected McPherson, the Jefferson County surveyor, to run the lines on the disputed boundaries as given in the 1796 deed. McPherson completed his work on October 7, 1822, but his findings, which supported the claims of the Armory, failed to satisfy Mrs. Wager.[2]

Repeated agitation on this question on the part of Mrs. Wager induced Superintendent Stubblefield on March 31,1823 to seek the assistance of the Ordnance Department in resolving this problem. As a result, Lt.Col. Burdine of the U.S. Army Topographical Engineers was ordered to Harper's Ferry to run a second survey[3], in September 1823. Taken ill at Harper's Ferry, Lt. Col. Burdine hired a surveyor to accomplish his task. The second survey, completed by October 1,1823, found that not one of the corner of the Six Acre Reservation corresponded with any other corner as given in the deed and by plotting, it was discovered that the Six

1. Catherine Wager to Stubblefield, May 3,1822, Reel 21, V.6,p.539.
2. Stubblefield to Col. George Bomford, Ordnance Department, October 7, 1822, Reel 21, Vol. 6, 559-560.
3. Bomford to Lt, Burdine, Sept. 12,1823, Reel, V. 4, p.368.

Acre Reservation was apparently lacking a small portion to complete the six acres.[4] Mrs. Wager wanted to extend the lines northwards towards the U.S. Potomac Canal;[5] however, no permanent boundaries were established in 1823 and the unresolved matter lay dormant for three more years.

In 1827, however, Mrs. Wager once again became very anxious to have the boundaries fixed and requested that a third survey be made to establish the precise limits of the U.S. lands at Harper's Ferry.[6] Col. Bomford informed Roswell Lee, the Superintendent of the Springfield Armory, who was then serving as acting superintendent of the Harper's Ferry Armory, that the Secretary of War had directed that a fourth survey be made and the lines should be run under the joint supervision of a council and a competent surveyor.[7] Lee was to pick the surveyor and he engaged William Castleman, Jr., and James M. Brown to make the survey. Their findings were incorporated into a "Memorandum of An Agreement," dated May 30, 1827, which was signed by Roswell Lee and James Stubblefield on behalf of the United States and by Catherine Wager and James Bates Wager, her oldest son, on behalf of the Wager heirs. **(See Map No. 1)**, P. 3.

The agreement directed that the corners of the Six Acre Reservation should be permanently marked on the ground in accordance with this survey. It was further "agreed that the U.S. shall built a wall of a reasonable height along and up to the line of the (Potomac) canal, and that said wall shall be waterproof, or built with water proof cement high enough to prevent the water from leaking out of said

4. Lt. Col. Burdine to Bomford, Sept. 24, 1823, Reel 21, v.6, p.607.
5. Lt. Col. Burine to Bomford, October 1, 1823, Reel 21, v.6, pp.609-610.
6. Ibid.
7. Bomford to Lee, May 19, 1827, Reel 14, V.6, p.523; Lee to Bomford, April 30, 1827, Reel 22, Vol. 1, p.5

"canal and running on the land of the Wager family."

Finally, it was agreed, "whereas the north-western line of the Ferry landing lot reserved by the Wager family has been hitherto uncertain, it is agreed that the corner of said line shall be, and is hereby fixed, and that it shall run thro a point designed by a gun-barrel long since planted there and along the southeast end and just clear of the said south east end of the post-office, a store house occupied by Robert Keyes (which was located on Wager Lot No. 11)."[8]

As a result of this agreement, Superintendent Stubblefield expended a total of $ 391.50 in 1828-29 "building a stone partition wall" between the U.S. musket Factory lands and the Wager Six Acre reservation. $ 300.00 was spent on building the wall in 1828

The last portion of this wall was constructed by John Johnson, who received $ 91.50 on March 31,1829 for quarrying, hauling and laying 162½ perches of stone wall " on the line between the U.S. land and the Wager heirs."[9]

8. Memorandum of an Agreement, May 30,1827, Reel 18, V. 8,.p.760-761. William Castlemen,Jr. and James M. Brown prepared a final plat, dated June 1827, on which they plotted the lines of the Wager lands and also the bounds of the U.S. lands from the 1796-1797 deeds, Map No. 55, Drawer 6, National Archives. See Appendix No. 2.

9.R.G. 217, 1st Series, File 12908, Voucher No. 78A.

Construction Program in 1829:

A total of $ 14,789.15 was expended by the Armory for repair and improvement in 1829.[1] Of this sum $ 914.19 went "for the purchase of timber, &c.", $ 91.50 "for Continuing the Stone Wall between the U. States lands & Wager heirs", along the Musket Factory Canal, and $ 4,496.46 for constructing new buildings at the Musket Factory.[2]

One new workshop, "A Proof and Engine House" was erected in 1829 at a cost of $ 1,500.00.[3] The Armory Paymaster's vouchers indicate that the following men constructed this edifice:

R.G. 217, 1st Series, 1829.

Date.	Payment	Name of Builder	Services Rendered	File	Voucher
Nov. 15 & Dec.12,1828	$10.50	Michael Walsh	"For quarrying 21 perches of stone for building a Proof House and Brass Foundery."	12579 12579	44A 114A
Feb/20, 1829	$ 20.00	Martin Cotter	For quarrying, hauling and laying 20 perches of stone at U.S. Proof House.	12908	50A
March 31	$ 18.00	Martin Cotter	for 12 days work in U.S. Armory puddling furnace	12908	106B
April 22	104.06	Martin Cotter	Mason work, for laying 166½ perches of stone wall of the foundry and engine house at the armory."	13478	22A
Aug. 25	23.59	Martin Cotter	"for trowel dashing Engine House, foundry, and proof house outside, 109 yards 4 feet and 5 inches at 12½ ¢ per yard= $ 13.68; for rough coating same in side, 123 yards, 8 feet, 7 inches = $ 9.91.	13626	29A
June 22,	78.17	Francis O'Neal	For carpenter work on a workshop	13478	186B
Recorded Total	$ 254.32	1829	Proof and Engine House, Brass Foundry		

Total Cost: $ 1,500.00.

1. Statement of Expenditures for the Year 1829.
2. Ibid.
3. Ibid.

In 1829 the sum of $ 2,996.46 was expended continuing the construction on the "new tilt hammer shop"at the musket factory.[4], with the $ 500.00 spent in 1828, a grand total of $ 3,496.46 was used for the construction of the tilt hammer shop in 1828-29.

The Paymaster's vouchers indicate that the following men worked on this project in 1829:

Date	Payment	Builder	Service rendered	File No.	Voucher No.
1/30	214.87	Samuel K. White	"For quarrying 573 perches of stone for putting up a tilt hammer shop at the armory."	12908	72A
1/15	130.00	Thomas Strider	for 20,000 bricks for new tilt hammer shop, laying heath and erecting chimney.	12908	12A
4/23	598.99	Edward Harding	"Mason work: laying 573 perches of stone mortar wall for $ 558.67; building 106 feet of brick cornice-$23.33; Turning 5 brick arches-$ 5.00; turning 4 stone arches -$ 12.00-in erecting a new tilt hammer shop for use of the armory."	13478	23A
12/31	203.75	Edward Harding	laying 99 perches of stone wall on coal bin- $ 61.87½; 211 perches of stone wall on new tilt hammer shop- $ 136.87½; 11 stone steps for tilt shop- $ 5.55.	13750	152A
4/28	146.50	Francis O'Neal	for carpenter work of 3 men, 116 days erecting a new Tilt Hammer shop for forging barrels for use of armory."	13478	32A
Recorded Total	$ 1,294.11	1829	Tilt Hammer Shop		

Reported Total expenditures: $ 2,996.46 on tilt hammer shop.

On December 14, 1829, the mason John Lackey was paid $ 38.25 for 25½ days work "making new pavement to the workshops."[5] On April 14, 1829, the brick mason

4. Statement of Expenditures for the Year 1829.
5. R.G. 217, 1st Series, File 13750, Voucher 65A.

Joseph Spencer received $ 34.50 for 23 days of mason work "repairing the Stocking Shop and erecting a chimney; laying a hearth for dwelling house."[6]

In November 1827, Inspector General John E. Wool made a detailed inspection of the U.S. Armory at Harper's Ferry and was not impressed by by the physical plant he saw. In a confidential report he wrote of the buildings:

> ... This establishment has, undoubtedly, been badly managed. Large sums of money have been expended without reference to permanency or utility. Every thing about it bears a temporary aspect. Very few, if any substantial buildings are to be found at the place. The shops are built of brick but in a state of dilapidation. These are surrounded by small buildings not fit for habitation.... The arms made at the Establishment may be equally good with those made at Springfield, but in every other respect the establishment (the U.S. Musket Factory and Arsenal) is far inferior - indeed it will bear no comparison with the latter. The (Armory Potomac) canal through which the water is conveyed to the shops, is too small for its length, consequently, when the water is low the works are suspended at intervals for the want of a supply of water to propel the machinery. This deficiency ought to be remedied, but it will cost some thousands of dollars. .....
>
> To pull down the buildings, which are a disgrace to the establishment and improperly located, and to erect those of a permanent character for the habitation of the workmen, and to make such other improvements as are necessary to place the establishment on a proper and respectable footing, would probably cost forty or fifty thousand dollars, which sum might have been saved if due regard had been paid originally to the location and construction of the buildings...: [7]

6. Record Group 217, 1st Series, File 13478, Voucher 10B.

7. Report dated Nov.16,1827, Reel 18, Vol. 13, pp. 1302-1303.

Summary of Construction of Musket Factory Buildings, 1822 - 1829:

The evidence presented indicates that an approximate total of $ 26,309.73 was expended for the construction and repair of buildings at the U.S. Musket Factory from 1822 to 1829. Of this total about $ 8,541.23 went for the construction of nine new buildings and four sheds, plus a start on a 10th workshop; $ 5,689.20 was used to make repairs or reconstruct old buildings; $ 1,989.00 was used to replace the wood shingle roofs of the shops with slate; $ 144.30 was utilized to construct a river flood wall; and about $ 9,946.00 went to pay for the construction of new machinery for the workshops.[1]

The new structures built included the following edifices:

Name	Cost of Construction	Year Built	Material
1. Shop for Turning and Tempering Locks	$ 150.00	1822.	Stone.
2. House for Annealing Gun Barrels	200.00	1823	Stone.
3. Shop for Draw Grinding, 18 by 27 feet, two stories.	481.42	1826	Stone.
4. Storehouse for Coal	202.35	1826	Stone
5. Shop for Annealing, casehardening, and tempering ramrods	111.00	1826	Stone
6. Shop for Half Stocking Machinery, 20 by 30 feet, 2 stories. $ 1,200 for structure and $ 1,600 for machinery.	2,800.00	1827	Brick
7. Watch House	200.00	1828	Stone
8. Charcoal Store House	750.00	1828	Wood
9. Proof and Engine House, Brass Foundry	1,500.00	1829	Stone
Under Construction:			
Tilt Hammer Shop(not finished)	3,496.46	1828-29	Stone & Brick.

1. Total for walls and the grand total do not include $ 391.50 what was expended to construct a stone wall along the south bank of the Armory canal opposite to the Wager Six Acre Reservation. The cost of this work is included later in this chapter under work on the Musket Factory canal.

Reconstructed	Cost	Year	Material
Large Workshop- The Turning or Finishing Shop-The Bell Shop. $ 5,000 for bldg., $ 5,000-machinery.	$ 10,000,00	1824-25	Brick.
Also Built:			
Four sheds , 3 over water wheels, one over annealing furnace.	250.00	1822	Wood
TOTAL: 9 new buildings, 4 sheds, one reconstructed shop	$ 20,141. 23		

See Chart No. 5, page 75, for annual rate of expenditure for repair and improvements at the U.S. Musket Factory, 1822 to 1829, on buildings.

Photograph No. 1, an undated painting done about 1826, see page 76, provides the first detailed look at the U.S. Musket Factory buildings and the Armory canal as they appeared in the period 1826-29.

Total spent on new buildings, 1822 to 1829: $ 10,141.23.

CHART NO. 5

EXPENDITURES FOR REPAIRS AND IMPROVEMENTS OF BUILDINGS
U.S. MUSKET FACTORY, 1822 - 1829

YEAR	New — Construct	Repair of Bldgs.	Slating	Flood Walls	New Machinery	TOTAL	No. of Bldgs. erected
1822	— $ 400.00	350.00				$ 750.00	1
1823	— 200.00					200.00	1
1824	—	5,000.00			5,000.00	10,000.00	0
1825	—		1,520.00			1,520.00	0
1826	— 794.77	339.20	469.00	144.30	995.00	2,742.27	3
1827	1,200.00				1,151.00	2,351.00	1
1828	1,450.00				2,800.00	4,250.00	2
1829	— 4,496.46					4496.46	1
TOTAL	$ 8,541.23	5,689.20	1,989.00	144.30	9,946.00	$ 26,309.73	9

PHOTOGRAPH NO. 1

The U.S. Musket Factory at Harper's Ferry, Virginia, ca. 1826.

Undated painting by an unknown 19th century Maryland artist. Original in Maryland Historical Society Collections, Baltimore, Md.

Harpers Ferry NHP Negative No. HF- 628

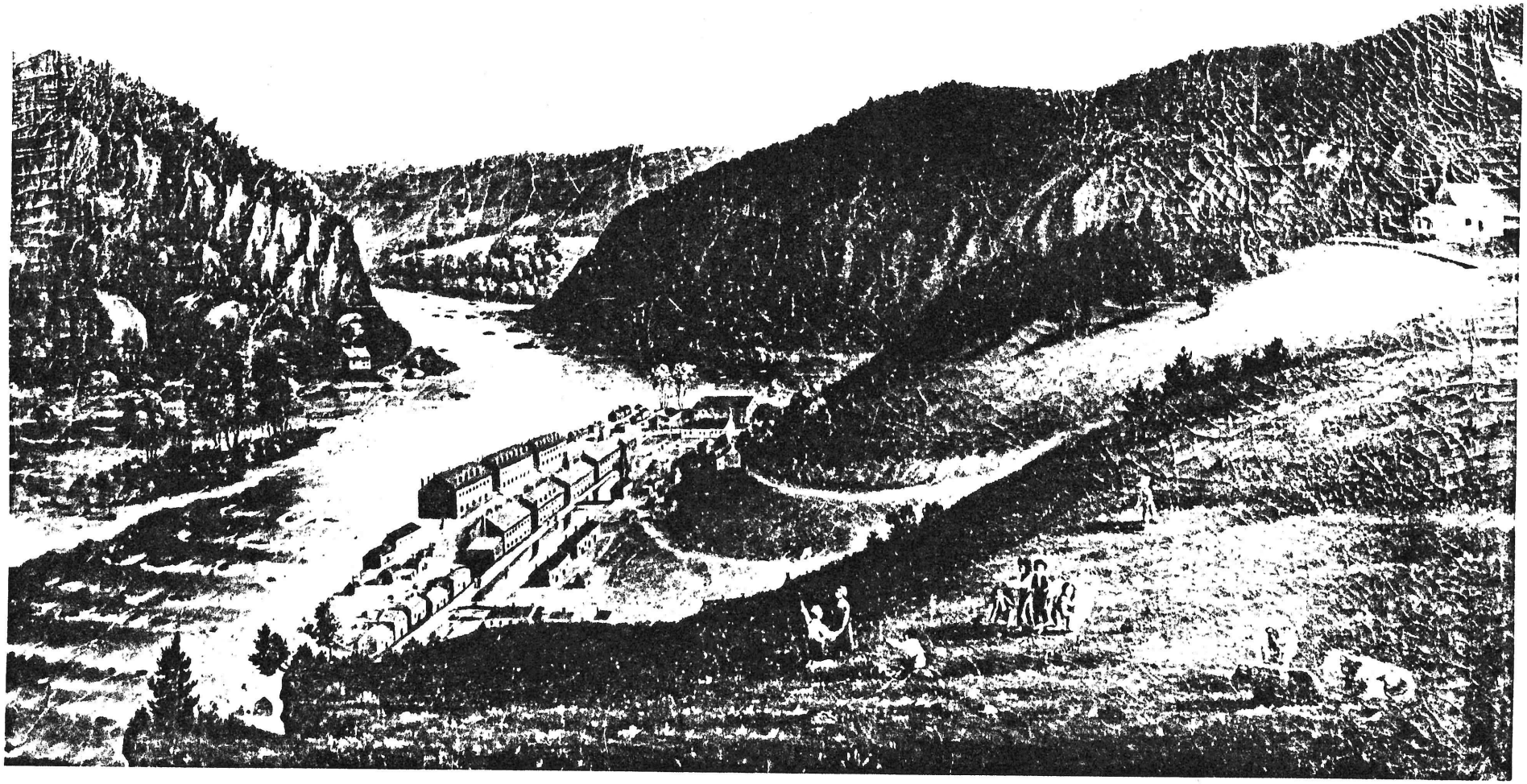
This undated painting portrays the U.S. Musket Factory buildings along the Potomac in in detail and with considerable historical accuracy. The two lines of large brick two-story workshops shown indicates that this painting was completed after 1813, when these structures finished. The cupola shown on Bldg. No. 2(see below)-The Bell Shop" was added to the roof of that building in March 1825, suggesting that this painting was made in the period 1825-1829, prior to completion of Wager family toll bridge across the Potomac . The toll bridge is missing from this view,

Southern line of large brick- two-story workshops fronting on the bank of the U.S. Armory Canal: reading from left(west) to right(east):

No. 5 (erected 1809-09 ,Stocking Shop, 111 bu 30 feet. Water wheel and machinery
No. 4 (built 1799-1800 as smiths shop, note 5 chimneys five on each side) for ten forges., In 1821, this shop was being utilized as a storehouse. 80 by 30 feet. No machinery.
No. 3 (erected in 1799-1800 as the armory or factory, with water wheels and machinery, 120 by 30 feet. Note the cupola on its roof.) The Boring Mill in 1821.
No. 2 (built 1809-10 was the finishing shop, had water-wheels and machinery. Known as the "Bell Shop" after 1825, 131 feet by 45 feet, the largest workshop.)
No. 1 (lower two story brick house at east head of line, 36 by 30 feet, erected 1808-09 and the residence of Superintendent James Stubblefield, 1809-1829.)

The Northern line of Armory work shops(three large two-story brick buildings fronting and the bank of the Potomac River) reading from left(west) to right(east).

Shop No. 6- Built 1808-09 as a smiths and filing shop, 80 by 30 feet, note 16 chimneys(eight on each slope of gable roof) for 16 forges.
No. 7 -Erected 1808-09 as a smiths and filing shop, 120 by 30 feet; note the 16 chimneys (eight on each slope of gable roof) for 16 forges.
No. 8- erected in 1808-09 as a smiths and filling shop, 130 by 30 feet; note the 16 chimneys (eight on each slope of gable roof).
These three shops did not have water-wheels or machinery.



The U.S. Musket Factory Canal on the Potomac: 1822 -1829:

The completion of the third in the series of dams on the Potomac River in 1820-21 provided the additional supply of water for the water wheels of the U.S. Musket Factory as had been hoped for, but this in turn produced a new problem: the old Potomac Canal proved to be too small to handle the increased flow of water! On August 2,1821, Superintendent James Stubblefield wrote that the banks of the U.S. Potomac canal were not strong enough to bear the weight of the additional water being brought in by the new dam and also that the existing walls were not high enough to keep the waters from overflowing.[1] . On May 15, 1822, the Superintendent submitted an estimate of $ 2,500 to complete building a new wall to keep the Potomac Canal waters in their channel.[2]

Work on constructing this new stone wall along the Potomac was underway in early June 1822 with three masons, Edward Cotter, John Lowstetter, and John McNulty, working on the project. They erected 835 perches of stone wall and 6,785 square yards of stone masonry wall during the year and the total cost was $ 2,434.75.(See Chart [6], p.78.[3] Stubblefield described the improved canal wall on November 12,1822, writing:

"...we have a Canal a mile and quarter in length the greater part of which is cut through solid rock. & a stone wall is now built the whole length for the support of the Bank averaging about 10 feet in height...."[4]

2. Reel 21, V. 6,p.545.
3. Total cost from Record Group 156- National Armory Accounts for 1822, Entry 935.
4. Reel 21, V p.570

1. Harpers Ferry National Historical Park Microfilm Reel 21, V.5, p.441.

CHART No. 6

New Walls for the Potomac Canal, 1822 - North or Outer Wall

File No.	Voucher No.	Mason	Paid	Date	Work Done
6274	49C	Edward Cotter	$ 39.00	June 3,1822	Laying 130 perches of stone wall,canal bank.
6274	78C	Edward Cotter	$ 43.50	June 29,1822	Lay 145 perches of Stone wall, canal bank
Subtotal-		Edward Cotter	$ 82.50	June 1822	275 perches stone wall
6274	84C	John McNulty	$ 898.00	June 29,1822	560 perches of stone wall=$ 448.00=+ filling in bank of canal with clay for 300 yards= $ 450.00
6606	72C	John McNulty	$1,075.55	Dec.31,1822	6785 square yards of masonry wall, including digging foundations= $ 1,017.75;for quarrying 228 perches of stor for making wall along canal= $ 57.80
Subtotal		John McNulty	$1,973.55	1822	560 perches stone wall+ 6785 sq.yrds,masonry wal
6724	69C	John Lowstetter	$200.00	June 27,1822	Filling in wall with cla and completely walls of lock gates at head of canal.
TOTAL:			$ 2,256.05	1822	835 perches stone wall+ 6,785 sq. yds masonry wall.
Sum not accounted for above			$ 178.70	1822	
Reported Total cost of project:			$ 2,434.75		

In 1825 the Armory spent a total of $ 521.50 repairing dams and canals on the Potomac and Shenandoah.[5] The Paymaster's vouchers indicate that $ 391.50, of this total was spent on the Shenandoah, thus leaving a balance of $ 130.00 for work done on the Potomac dam and canal.[6]

5. National Armory Accounts for 1825.

6. R.G. 217-file 9310,V. 21A and 122A, total $ 391.50 for work on the Shenandoah canal and dam.

In the Spring of 1826 $ 15.00 was expended "blasting rocks at the head of the Potomac Canal" in order to remove obstructions that were blocking the flow of water[7]. In addition, $ 151.74 spent to have 172 perches of stone wall laid"at the lock of Maryland [or Potomac Company] Canal."[8] In August 1827 Thomas Keyes was paid $ 18.00 for clearing obstructions from the Potomac Canal.[9] Also in 1827, $ 100.00 was spent for " Improvements on Potomac Dam, at the head of [the Potomac Company's] Navigation Canal" on the Maryland side of the Potomac.[10]

The total of $ 251.74 spent on the Potomac Company' Canal in Maryland in 1826-27 was done to ensure an adequate supply of water for the U.S. Musket Factory shops in Virginia during period of low water. Superintendent Stubblefield explained on June 14,1826:

> The prevailing drought has caused an unusual scarcity of water in our [Armory] Canal, and which can be remedied only, by fixing a lock gate in the canal on the opposite side of the river [in maryland]. This Canal was made by the Potomack Company and commences opposite the basin at the head of our canal & the rocks above the basin are so situated as to cause the current of the water, when the river is low, to incline to the Maryland shore, and pass off through the Companies Canal. I have often been compelled during the summer season to make a temporary dam in this canal; but that is attended with trouble and expence, as the dam would have to be removed to let the boats pass. which frequently occurred during the last season. I conversed with Col. Mason on the subject last fall and believe there will be no difficulty in obtaining permission from the Company to erect the Lock Gate. He informed me that they contemplated employing a toll gatherer at their place who for a moderate compensation would attend to opening the gate for the passage of boats, as it would be unnecessary to keep the gate closed for more than about three months in each year.
>
> The expence of making & puting in the Lock Gate would not exceed on hundred Dollars; and if you will have the goodiness to confer with Genl. Mason and obtain the privilege from the Directors, it will be a great service to this establishment..[11]

7. National Armory Accounts for 1826. The blasting was done by William McCobb in March and April 1826-R.G. 217-File 9851-V. 20A-to McCobb for $ 10.00, March 17,1826, and F. 10053-V. 9A- to McCobb on April 27,1826, for $ 5.00.
8. National Armory Accounts for 1826.
9. R.G. 217-F. 11622-V. 214B, Aug. 30,1827, to Keyes for $ 18.00.
10. National Armory Accounts for 1827.
11. Reel 21, V. 9, p.935-936.

Chief of Ordnance, George Bomford, responding on June 22, sent a copy of a Potomac Company board of Director's resolution granting permission to the United States to erect the proposed lock gate and Bomford also gave Stubblefield permission to construct the gate.[12] By the end of 1827, however, the Canal Company had changed its mind on the 1826 gate that the Armory had built to its canal. Bomford now informed Stubblefield:

> I have been informed by the Treasurer of the Potomac company, that the Lock Gate fixed in their canal at Harper's Ferry under the resolution of the Board of Directors (of June 1826) ... has been complained of by the Boatmen navigating the Potomac, has rendered the navigation round the falls very dangerous & difficult ; and that it is the wish of company, that measures be adopted to remedy the evils complained of.....
>
> You will therefore proceed to do so, either by altering the gate, or by taking it way, if the object can not be otherwise effected.[13]

On February 29, 1828, Superintendent Stubblefield submitted to the Ordnance Department a plan to correct the situation at the Potomac Company lock gate that had been prepared by Thomas Keyes, Jr., of Harper's Ferry; the estimated cost of this work was $ 300.00.[14] The plan was adopted and on March 22,1829, Thomas Keyes,Jr. was paid a total of $ 200.00" for erecting gates &C. at the head of the Potomac Navaigation Company Canal (on the Maryland side) opposite the armory for the purpose of throwing a necessary supply of water into the Armory Canal."[15] Keyes' alteration appears to have corrected the situation for there is no further mention of this problem in the Armory records. Total cost of the Potomac Company Canal lock gate project from 1826 to 1829 thus came to $ 451.74.

12. Ibid.,
13. Reel 14, V.6, p.543.
14. Reel 22, V. 4, 387.
15. R.G. 217- F. 12908-Voucher 112A.

Returning to the U.S. Armory Canal on the Virginia side of the Potomac, we have seen how the Armory spent a total of $ 2,434.75 in 1822 to erect a stone wall about 10 feet high and about one and one-quarter miles long along the outer or northern bank of the canal in order to increase the flow of water to the Musket Factory shops and to keep the water from overflowing the river banks. On January 7,1828 Superintendent Stubblefield submitted a plan and a request for $ 2,000.00 to deepen and widen the Armory Potomac Canal by raising the height of the inner bank and erecting a stone wall on the inner bank side of the canal. The inner stone wall, about five feet high, and 18 inches thick above ground, would prevent the canal from overflowing the roads along the inner bank and increase the flow of water that the canal could carry.

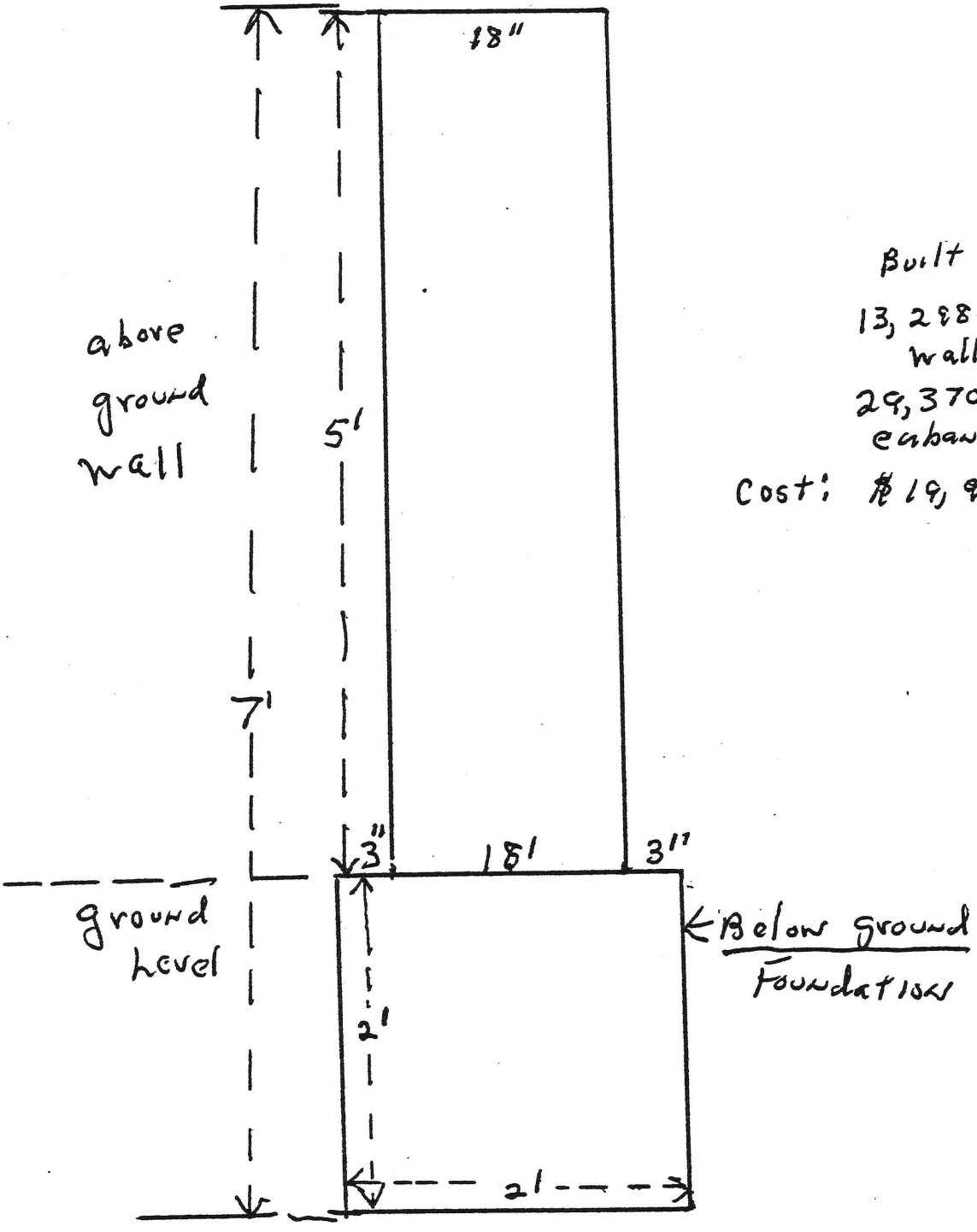
On May 23.1828, in his final plan for the canal, Stubblefield wrote: ...Along the bank of the Canal it will be necessary to sink the foundation about two feet and raise it five feet above the top of the bank. The foundation will be two feet thick- the rest of the wall eighteen inches. The wall will continue along the Canal bank until it joins a wall already built on that part of the U.S. lands situated above the Six Acre lot - and on the same side of the canal- which of course will supersede (sic) the necessity of running it off to the Charlestown road..." [16]

This plan was approved by the Ordnance Department and on July 22 1828, Acting Superintendent Lieut. John Symington reported that he had issued proposals for bids to construct the canal walls.[17]

16. Reel 22, Vol. 4, p.353-354. In 1828-29 a total of $ 391.50 was spent building a stone partition wall along the southern edge of the Armory canal as it passed through the Wager Six Acre Reservation property.

17. Reel 22, V. 7,p.853.

Plan of South Canal Bank Stone Wall 1828



Built Nov, 1828–1832—
13,288½ Perches of stone wall.
29,370½ cubic yards of embankments.
Cost: $19,951.72

Canal INNER or Southern Stone Wall– plan of May 23, 1828 US Musket Factory Canal

June 1981

C.W. Snell

The National Armory Report for 1828 indicates that a total of $ 5,500.00 was spent during that year for "Repairing the old and erecting in part a new dam on the Potomac river, repairing and widening the Potomac Canal, and erecting guard gates &c. for the same." The Paymaster's vouchers for the 3rd and 4th Quarters of 1828, however, reveal that only $ 782.36 of the $ 5,500 total, went for work on the Canal, the balance of approximately $ 4,717.64, accordingly must have gone for work on the dam.

As to work on the canal in 1828, during November of that year, the mason John Johnson was paid $ 200.00 for quarrying, hauling, and laying 200 perches of stone wall "at the lock walls at the head of the Potomac Canal, and carpenter Francis O'Neal received $ 136.75 for"erecting a guard and waste gate at the Potomac Canal and dam."[18]

Six masons: George W. Bond, James Daughtery, Johnson Garrett, John Gust, Edward Harding, and John Johnson, and one carpenter, Francis O'Neal, worked on widening the canal and raising the embankments in 1829. A total of 2,293½ perches of stone wall were erected and 6,320½ cubic yards of embankment were made on the Potomac Canal at a cost of $ 3,752.35 in 1829.[19]

With the 1828 work included, a grand total of more than 2.493½ perches of stone wall and 6,320½ cubic yards of embankment had been made in 1828-29 at a expenditure of $ 5,013.09. This figure does not included the $ 391.50 that spent to build the stone partition wall between the Wager and U.S. lands in 1828-29.[20]

On January 1,1830, the stone wall and earthern embankments of the Potomac Canal were still far from being complete: masons Johnson Garrett and John Gust were to continue work on this project during 1830 and 1831.

18. See Chart 3.
19. See Chart 2.
20. The National Armory Accounts for 1829 reports that a total of $ 5,430.23 was expended that year "on the Potomac Dam and widening the Canal". The Paymaster vouchers for the canal work suggest that the balance of $ 1,677.88 went for work on the Potomac dam. See pp.67-69 for story of construction of partition wall,1822-29.

Widening The U.S. Potomac Canal, 1829 Southern or Inner Wall:

File No.	Vou No.	Artisan	Date	Amount	Remarks
13626	46A	John Gust	8/28/29	$ 4.00	Repair wall and bank near lock gates, 4 days work.
13750	10A	" "	10/9/29	$ 100.00	Making 500 cubic yds embankment of new Potomac Canal.
13750	28A	" "	11/10/29	$ 150.00	for 750 cubic yds.embankment.
13750	71A	" "	12/15/29	$ 203.50	For 1,017½ cu.yds embankment.
13750	150A	" "	12/31/29	100.00	For mason work,erecting 100 perch stone wall on new canal.
Subtotal:		John Gust	1829	$ 557.50	For 2,267½ cub.yds of embankment at $ 1,453.50 and 100 perch of stone wall for $ 100.00
12579	46A	Francis O"Neal	3/31/29	$ 148.75	For 45 days carpenter work on guard gates at head of U.S.Canal.
13478	74A	James Daugherty	5/9/29	$ 100.00	For mason work, erecting 100 perch stone wall at U.S. Potomac Canal.
13478	133A	" "	5/30/29	$ 200.00	For quarrying,hauling & laying 200 perch of stone wall.
13626	5A	" "	7/11/29	$ 230.70	For 358½ perch stone wall and 861 cubic yds. embankment on Canal.
Subotal:		James Daughtery	1829	$ 530.70	For 658½ perches of stone wall and 861 cubic yrds of embankment.
12908	93B	Edward Harding	2/26/29	$ 77.50	For 27 days mason work building walls for a guard gate toPotomac Canal.
13478	132B	George W. Bond	5/30/29	$ 165.00	For 110 days work quarrying stone and raising embankment of canal.
13750	19A	" " "	10/15/29	$ 103.10(about)	for quarrying and delivering 412 perches 13 feet of stone in April and May 1829.
		" "			
13750	30A	" " "	11/10/29	$ 413.65	Balance due for quarrying 27 perch of stone=$ 6.75; raising canal bank by 518 cubic yards= $ 129.66; excavating canal bank 540 cubic yds = $ 237.74 and puddling canal bank= $ 142.00.
Subtotal:		George W. Bond	1829	$681.75	439 perch of stone,518 cubic yds. of embankment.
12908	53A	John Johnson	3/1/29	$ 255.00	Mason work,filling in 1,275 cubic yds embankment,Potomac Canal.
12908	73A	" "	3/31/29	161.75	For quarrying,hauling & laying 161 3/4 perch stone wall along Canal.
12908	109A	" "	3/31/29	50.00	For use of cart & horse 33 1/3 days at lock at head of Armory Canal.
13478	24A	" "	4/23/29	43.00	for erecting 43 perch stone wall.
13478	30A	" "	4/27/29	230.00	For quarrying & laying 230 perch stone wall.
13478	76A	" "	5/10/29	129.80	For 649 cubic yrds embankment at head of Potomac Canal.
13478	193A	" "	6/25/29	150.00	For 750 cubic yrds embankment.
13626	58A	" "	9/2/29	361.60	For laying 361 perches,14 feet, 9 inches stone wall, Potomac Canal.
Subtotal		John Johnson	1829	$ 1,381.15	796 1/3 perch; 2,674 cubic yds.

CHART 8

WIDENING THE U.S. POTOMAC CANAL, 1829:

File No.	Vou. No.	Artisan	Date	Amount	Remarks
13750	37A	Johnson Garrett	11/12/29	$ 125.00	Mason work, for erecting 100 perches of stone wall on Potomac Canal.
13750	70A	" "	12/15/29	$ 125.00	For 100 perches stone wall,canal.
13750	142A	" "	12/31/29	$ 125.00	For 100 perch stone wall, canal.
Subotal:		Johnson Garrett	1829	$ 375.00	For 300 perches stone wall.
Total:			1829	$ 3,752.35	For 2,293½ Perches of stone wall and 6,320½ cubic yards of embankment

Records for the 1st and 2nd quarters of 1828 are missing:					
12579	46A	Francis O'Neal	11/15/28	$ 136.75	For carpenter work,erecting a guard and waste gate at Potomac Canal and dam.
12579	58A	John Johnson	11/21/28	$ 200.00	For quarrying, hauling & laying 200 perch of stone wall at the lock walls at the head of the Potomac Canal.
Total: 3rd & 4th Quarters of 1828:				$ 336.50	For 200 perches stone inguard gate wall & new gate

Expenditures on the U.S. Armory Potomac Canal, 1822 -1829, were approximately as follows:

Year	U.S Potomac Canal	Wager-U.S. Line Wall, Canal	Potomac Company Md. Side Canal Lock Gate.	Total Potomac Canal
1822	$ 2,434.75			$ 2,434.75
1825	130.00			130.00
1826	15.00		151.74	166.74
1827	18.00		100.00	118.00
1828	782.36	300.00	200.00	1,282.36
1829	4,230.73	91.50		4,322.23
Total:	7,610.84	391.50	451.74	8,454.08

For this money the following construction was completed:

In 1822, for new $ 2,434.75, a new outer (or northern) stone wall one and one-quarter miles long averaging 10 feet in height and containing 835 perches of stone wall and 6,785 square yards of stone masonry wall.

In 1828-29, a inner or southern stone along the U.S. Armory canal at a cost of $ 5,013.09 containing more than 2,493½ perches of stone wall and 6,320½ cubic yards of earthern embankment. At a cost of $ 391.50 a stone wall was also built on the south side of the canal on the partition line with the Wager Six Acre Reservation and ran about 408 feet 8 inches from a point opposite Wager Lot 18(probably) west to the northwest corner of Wager Lot No. 34. Total cost of the inner or southern stone wall, 1828-29 was thus about $ 5,404.59

In 1826-1827 a total of $ 33.00 was spent blasting rocks out of the basin above (west) of the entrance to the Armory canal in an effort to increase the flow of water into the canal.

Finally in 1826-28, a total of $ 451.74 was expended remodelling the Potomac Company's lock gate on the northern or Maryland side of the Potomac, above the U.S. Armory dam, in order to ensure a adequate supply of water for the Musket Factory Canal during periods of low water.

Photograph No. 1, page 76 , a painting made about 1826, provides us with the first known view of the U.S. Musket Factory canal. Note the two wooden foot bridges spaning the canal.

The Potomac Dam for the U.S. Musket Factory: 1822 - 1829:

As has been mentioned, the U.S. Dam across the Potomac River had been rebuilt for a third time in 1820-21 at a cost of approximately $ 11,200. This structure apparently stood up well for six years, for there is no record of large scale repairs being made to the dam in this period. On July 14, 1827, however, Superintendent Stubblefield submitted a request to the Ordnance Department for $ 2,000.00 to repair the Potomac Dam which he reported had been much damage by high water and ice during the winter of 1826-27.[1] While awaiting a reply to his proposal, Stubblefield had Philip Coons make temporary repairs to the dam at a cost of $ 187.87 in July 1827.[2]

Stubblefield's plan for repairing the existing dam changed to one for erecting a new one, which he said would supply an additional quantity of water for the Musket Factory machinery. On January 7,1828, the Superintendent explained that he intended to build a new dam which would be located just below the 1820-21 structure and that he planned to fill in the space between the two dams with gravel.[3] Col. Bomford, the Chief of Ordnance, approved Stubblefield's project.[4]

On April 4,1828, Stubblefield entered into an contract with Lewis Wernwag of Virginius Island, "bridge builder,"millwright, machinist mason, and carpenter, to construct the 4th dam across the Potomac.

1. HFNHP Reel 22, V. 1,p.91.
2. See Chart H, p. vouchers for 1827.
3. Reel 22, V. 4, p.353.
4. reel 14, Vol. 6, p. 539-540.

The contract specified that the new dam was to be built as follows: (See Appendix No. 3):

"The Dam is to commence at the second angle of the old dam from the head of the Armory Canal and extended thence along the course of immediately below ... the old Dam 60 rods. To be 10 feet wide and filled in with stone in such a manner as to render it tight and permanent. To be constructed on the principle of the small Dam stretching from the point at the Shenandoah locks to the Island. To be constructed of sound timber ... To be ensured by said Lewis Wernwag for 12 months from the completion thereof, and the said Stubblefield... agrees on his part to furnish all the Iron that may be required for said work and to pay said Wernwag for the same at the rate of $ 50 per rod...." [5]

The Armory Paymaster's vouchers for the 1st, 2nd, and 3rd quarters of 1828 are missing from their proper place in the National Archives records so that it is not possible to trace Lewis Wernwag's construction of the dam in the period April to June 30, 1828. The records for 4th quarter of 1828 (see Chart 8, p. 88) indicated that in October 1828 he was paid $ 310.00 for quarrying, hauling, and laying 310 perches of stone in the guard wall at the head of the Potomac Canal, and in 1829 received $ 745.75 for his work, so the grand total received, according the extant vouchers $ 1,016.00 for 854 perches of stone wall and 1,200 cubic yards of embankment.

National Armory Accounts for 1828 and 1829 indicate that a grand total of $ 10,930.23 was spent on work on the Potomac canal and dam in those years. After deducting documented expenditures for work on the canal, the following approximate sums were spent on the Potomac Dam in 1828-29:

1828: $	4,717.64
1829: $	1,199.50
Total $	5,917.14

5. Reel 20, V.5, pp.499-500-Memorandum of Agreement, April 4, 1828.

CHART 8

POTOMAC DAM, 1827 - 1829

File No.	Vouc. No.	Artisan	Date	Amount	Remarks:
11622	23B	John Gust	7/21/27	$ 4.50	For three days work with cart and horse repairing Potomac Dam.
11622	215B	Philip Coons	7/31/27	$ 181.12	For repair of Potomac Dam- mason work.
11622	107B	James Norris	8/25/27	$ 2.25	For 3 days work on the Potomac dam.
Total:			1827	$ 187.87	Repair of Potomac Dam
The Records for the 1st and 2nd Quarters of 1828 are missing.					
The Contractor for rebuilding the Potomac Dam in 1828-29 was Lewis Wernwag:					
12579	7A	Lewis Wernwag	10/12/28	$ 150.00	For quarrying, hauling, and laying 150 perches of stone in erecting guard wall at head of U.S. Potomac Canal.
12579	34A	Lewis Wernwag	11/1/28	$ 160.00	For quarrying, hauling & laying 160 perch of stone wall erected in a wall at head of Canal.
12908	10A	" "	1/15/29	$ 133.00	For quarrying, hauling, laying 133 perches of stone wall at head of U.S. Potomac Dam.
12908	18B	" "	1/15/29	$ 25.75	For work on the Potomac Dam, hauli and laying stone on dam=$ 10.00; fo 16 2/3 perches of stone=$ 13.25; four loads of sand =$ 2.50.
12908	31A	" "	1/28/29	$ 530.00	For mason work, 1,200 cubic yds of embankment at U.S. Potomac Dam= $ 240.00+ 290 perches of stone wall to support bank of Potomac Dam= $ 290.00.
13750	91A	" "	12/28/29	$ 50.25	For mason work, erecting 100½ perc of stone wall on Potomac Dam in Oct. and Nov.
Subtotal:		Lewis Wernwag	1828-29	$1,016.00	For 854 perches of stone wall and 1,200 cubic yards of embankment
12908	123A	Gassur(?) Cross	3/26/29	$ 427.50	For 68,400 feet of solid unhewn timber reduced to one inch board for use on U.S. Armory Dam.
13750	57A	Valintine Jacobs	12/11/29	33.00	For 22 days mason work on the abut ments of the Potomac Dam
TOTAL:			1828-29	$ 1476.50	

Probable cost of dam: Total to Lewis Wernwag: $ 3,511.63

for Timber 1,945.01

Other Costs 460.50

Total: $ 5,917.14.

CHART NO. 9

Timber Purchased for the Potomac Dam

1828

Statement of Timber purchased for the Erection of the Potomac Dam, and delivered to Lewis Kerneay the Contractor for that purpose during the Year 1828.

Feby. 8th 1828	William Carlisle	For one Log measuring 100 feet	@8¢ per foot	8.00
" 25 "	Wm. Daugherty	" 346 feet & 97 Inches Hewed Timber	@8¢	27.71
Mar. 4 "	Silas Peacher	" 70 feet of Square Timber	@10¢	7.00
" 27 "	Danl. Clemants	" 23,523 Cubic feet of round Timber	@6.00 per	141.18
April 7 "	Silas Peacher	" 811 Cubic feet Hewed Timber	@10¢	81.10
" 8	William Daugherty	" 5,580 " " " "	@10¢	558.00
March 31	John Anderson	" 101 Hewed Logs	@60 Ea.	60.60
" 25	Walker Lanthum	" 1,000 Cubic feet Hewed Timber	@10	100.00
" 31	Wm. Carlisle	" 643 feet of Hewed timber	@8¢	51.44
April 22d	Middleton Smith	" 38,477 " Round Logs (Potomac Dam	@62½ pr. 100	240.48
" "	Thomas Johnson	" 612 Cubic feet Sq. Logs " "	6¢	43.96
" "	Wm. Dickerstuff	" 50,506 feet round Timber	62½	371.91
May 17	Christopher Haskell	" 564 feet Hewed Timber	@10¢	56.40
" 22	Joseph Doran	" 1250½ Cubic feet Hewed Timber	@10	129.05
July	Charles Orrack	" 12,517 Cubic feet of Timber	@50¢	62.58½
				$1,945.01½

Harpers Ferry NHP Reel 22, Vol. 5, p. 403.

The dam was completed by the end of January 1829. Of the total of $ 5,917.14, Lewis Wernwag apparently received $ 3,511.63 (see below).

A investigation of the dam construction project in 1831, revealed that all of the gravel filling which had been placed at the bottom of the new dam to make it water tight, except for 150 feet at the south end, had been placed there by Armory workmen at no apparent cost to Wernwag, although the contract specified that the dam was to be made permanent and watertight at Wernwag's expense. It was further discovered that Wernwag had been paid $ 1,250.00 in cash and $ 2,261.63 in U.S. timber, making a total of $ 3,511.63, whereas the contract called for a payment of only $ 3,000 . Wernwag had also extended the framework of the new dam beyond the contract limit of 60 rods or 990 feet, but had failed to fill it with gravel, with the result that subsequent high water had destroyed the unfinished extension. [6]

From 1822 to 1829 a total of approximately $ 6,105.01 was spent for the repair and construction of the Potomac Dam.

The plan and location of the rebuilt dam is probably shown on Map No. 6 , drawn in 1837, p. 182.

6. Finding of Superintendent George Rust Jr., December 3, 1831, Reel 22, Vol. 12, pp. 1160-1161. This was discovered when Lewis Wernwag filed a claim with the Ordnance Department requesting additional payment for the construction of the Potomac Dam.
The 1828 contract statedthat "all timber that has or may be furnished said Wernwag by the U. States shall be charged against him at the cost price ub part payment for said work." A Statement of Timber purchased by the U.S. for the Erection of the Potomac Dam, and delivered to Lewis Wernwag, the Contractor during the Year 1828 (Feb. 8 to July 1828) reveals that the U.S spent $ 1,945.01½ for this purpose. Reel 22, Vol. 5, p. 403.

Summary, U.S. Musket Factory Buildings, Canal, and Dam, 1822- 1829:

Chart No. 10 below, indicates that the U.S. Armory spent an approximate total of $ 40,868.82 for the repair and improvement of the U.S. Musket Factory plant, including the buildings, canal and dam, from 1822 to 1829. Of the total, about $ 26,309.73 went for work on Musket Factory workshops and storehouses, $ 8,454.08 for work on the canal, and $ 6,105.01 for repair and improvement of the U.S. Potomac dam.

CHART NO. 10

EXPENDITURES FOR MUSKET FACTORY BUILDINGS, CANAL, AND DAM, 1822-29: REPAIRS AND IMPROVEMENTS:

YEAR	Musket Factory Buildings	Armory Canal	Armory Dam	Total- MUSKET FACTORY
1822	$ 750.00	2,434.75		$ 3,184.75
1823	200.00			200.00
1824	10,000.00			10,000.00
1825	1,520.00	130.00		1,650.00
1826	2,742.27	166.74		2,909.01
1827	2,351.00	118.00	187.87	2,656.87
1828	4,250.00	1,282.36	4,717.64	10,250.00
1829	4,496.46	4,322.23	1,199.50	10,018.19
TOTAL	$ 26,309.73	$ 8,454.08	$ 6,105.01	$ 40,868.82

CHAPTER VII

The U.S. MUSKET FACTORY, 1830 - 1835

Beginning in 1830, whenever the Ordnance Department wished to make major improvements or repairs at the national armories and arsenals, it first submitted special estimates to Congress, explaining in some detail the need for and nature of the proposed improvements. The Congress, if approving of the proposed work, then appropriated funds that were earmarked for use in specific projects.

Col. George Bomford, the Chief of Ordnance, in a letter of November 30, 1829 to Secretary of War John H. Eaton, had first suggested and explained the need for this system of providing money for repair and improvement as follows: "The additional sums required in this estimate, are for additions and improvements of a permanent character. It has been customary, heretofore, to make improvements of this kind to a limited extent, from time to time, as the necessities of the armories required, from the annual appropriations (for the production of arms). But as those now required are extensive, they cannot be made from the ordinary appropriation, without materially diminishing the ordinary product of arms. As it is considered proper to continue the usual operations of the armories, and, at the same time, to make the improvements suggested, which are very necessary to the advantageous operation of the works, additional appropriations are necessary...:"[1]

The physical plants of the National Armories at Springfield, Massachusetts, and Harper's Ferry, Virginia, producing arms since 1795 and 1801 respectively, were apparently both aging and would require large sums of money to replace the original workshops and storehouses. The new system of providing money for repair and improvement was utilized from 1830 to 1861.

1. Serial No. 195, Document No. 2, p. 129, 21st Congress, 1st Session, 1829-30, House Executive Documents, Vol.1.

During the years 1830 to December 31,1835, Congress appropriated a grand total of $ 141,478.00 in special funds for specific construction and repair projects, the making of new machinery, and the purchase of additional land.(See Chart No. 10* for the 1830-35 appropriations, p. 94). Of the total, $ 112,898.28 was to be applied to the improvement and repair of the U.S. Musket Factory at Harper's Ferry for the following projects:

1. Repair and slating of Old workshops:..... $ 4,700.00
2. Construction of New Workshops and Storehouses,. 9 buildings..... 30,334.65
3. For making new water wheels and new machinery..... 34,440.47
4. For extending the walls and embankments and for widening the Musket Factory Canal..... 35,823.16
5. For repairing and extending the Potomac Dam..... 5,000.00

Total appropriation for Musket Factory, 1830-35 $ 112,898.28

The vouchers issued by the Armory Paymaster from 1830 to 1835 (National Archives Record Group No. 217- Records of the Second Auditor of the Treasury Department), indicate that approximately $ 121,344.28 of the total of $ 141.478.00 appropriated for repair and improvements was expended during the period 1830-35, with the remaining balance being carried over for use in 1836. The National Armory Accounts, consisting of the annual reports submitted by the Chief of Ordnance to Congress, documents that fact that a total of $ 152,971.48 was spent for repair and construction 1830-35, and with the $ 2,600 expended on the purchase of land included, the grand total was $ 155,571.48(See Chart 11, p. 95). This indicates that the $ 34,227.20 difference between the $ 121,344.28 spent from special appropriations and the total of $ 155,571.48, must have come from the Armory's general operating funds.

CHART 10 A

SPECIAL APPROPRIATIONS FOR PERMANENT IMPROVEMENTS AT THE HARPER'S FERRY ARMORY, VA., 1830 - 1835.

Project:	(1) 1830	(2) 1831	(3) 1832	(4) 1833	(5) 1834	(6) 1835	Total
Extending walls & Enbamkments pf Potomac Canal	9,300	7,500	0	0	0	0	$ 16,800.00
Widening the Potomac Canal	-	-	-	13,495	5,528.16	0	19,023.16
Repairing & extend- the Potomac Dam	-	-	-	5,000	0	0	5,000.00
Erecting forge, tilt hammer shop and new grinding mill	6,500	-	-	13,300	0	0	19,800.00
Erecting 18 dwelling houses	10,000	-	-	8,600	0	0	18,600.00
slating roofs of Workshops	3,200	0	0	0	0	0	3,200.00
Repair walls of four workshops	-	0	0	1500	0	0	1,500.00
Making new water wheels for stocking, turning & boring shops	-	-	-	8,400	0	0	8,400.00
Completion of machinry in stocking, turning & boring shops	-	-	-	-	26,040.47	0	26,040.47
Erecting storehouse for iron, repairing officers- quarters, sinking 3 wells, paving street, painting bldgs.	-	River Wall.	-	-	8,589.87	0	8,589.87
Erecting annealing shop & proof house, 2 polishing shops for tempering springs and polish- in barrels, erecting 2 fire engine houses, new carpenter & machine shop, and making addition to stocking shop	-		-	-	7,924.50	0	7,924.50
Purchase of water power rights on Shenandoah	-	-	-	4,600	0	0	4,600.00
Repair and extension of U.S. Dam on the Shenandoah	-	-	-	-	2,000.00	0	2,000.00
TOTAL:	29,000	7,500	0	54,895	50,083.00	0	$ 141,478.00

1. U.S. Statues at Large, Vol. IV, p. 424.
2. U.S. Statues at Large, Vol. IV, p. 467.
3. Ibid.
4. U.S. Statues at Large, Vol. IV, 641-642.
5. U.S. Statues at Large, Vol. IV, p. 675, 680.
6. Ibid.

CHART NO. 11

TOTAL OF ACTUAL EXPENDITURES FOR CONSTRUCTION, REPAIR AND LAND AT THE U.S. ARMORY AT HARPER'S FERRY, VIRGINIA, 1830 - 1835:

Year	Approp. for Construction.	Armory Expenditures for Land	Armory Expenditures for Construction and Repair	No. of Arms Made	No. of workmen	Source Expend. Serial Ser.	Source Expend. Serial Doc.
1830	$ 29,000.00	0	$ 14,431.93	10,130	196	209-	125
1831	7,500.00	0	18,237.33	11,160	242	219-	170
1832	0	0	18,408.68	16,360	272	235-	121
1833	54,895.00	$ 2,600.00	33,422.91	15,670	249	257-	322
1834	50,083.00	0	45,038.16	12,970	255	275-	188
1835	0	0	23,432.47	11,714	229	292-	294
1830-1835	$ 141,478.00	$ 2,600.00	$ 152,971.48	78,004	-	-	
1796 1835	$ -	$ 45,477.28	$ 561,476.14	311,115	-	-	

Total for Construction and repair and land: $ 155,571.48.

Chart No. 12, page 96, indicates that actual total expenditures for the various projects, 1830-35 were as follows:

Project	Amount Approp.	Expended 1830-35	Balance Left 1/36
1.Repair & Slating Old Shops	$ 4,700.00	$ 3,863.37	$ 836.62
2. Construction new shops	30,334.65	21,970.44	8,364.21
3. Making new Machinery	34,440.47	35,248.82	
Subtotal: Musket Factory Bldgs.	$ 69,476.02	$ 61,082.63	
4.Musket Factory Canal	35,823.16	33,969.50	3,133.93
5. Musket Factory Dam:	5,000.00	4,206.73	793.66
TOTAL:	$ 112,898.28	$ 99,258.86	$20,449.87

CHART NO. 12

ACTUAL ANNUAL EXPENDITURES FROM SPECIAL APPROPRIATIONS FOR PERMANENT IMPROVEMENTS AT THE U.S. MUSKET FACTORY, 1830 - 1835:

YEAR	Extending Walls & Embankments Canal	Widening Potomac Canal	Repair & Extension Potomac Dam	Erecting Forging, Til Hammer & Grinding Mil	Slating Roof of Workshops	Repairing walls of four work-shops	Making 3 new water-wheels for 3 shops.	Completing Machinery in three shops.	Erecting Store House &c/	GRAND TOTAL
1830	9,043.00	-	-	0	0	-	-	-	-	$ 9,043.00
1831	4,803.37	-	-	3,744.63	0	-	-	-	-	8,548.00
1832	1,673.30	-	-	710.96	380.48	-	-	-	-	2,764.74
1833	-	7,833.08	3,374.94	0	2,632.94	849.95	6,294.90	-	-	20,985.81
1834	-	10,616.75	489.04	4,959.81	0	0	1,787.38	16,245.52	2,416.10	36,514.60
1835	-	0	342.75	8,540.19½	0	0	0	10,921.02	1,598.75	21,402.71
TOTAL:	15,519.67	18,449.83	4,206.73	17,955.59	3,013.42	849.95	8,082.28	27,166.54	4,014.85	$ 99,258.86
BALANCE LEFT:	* 1,280.33	1,853.60	793.66	1,844.59	186.58	650.05	317.72	8,948.32	4,575.02	20,449.87
APPROP-RIATION	16,800.00	19,023.16	5,000.00	19,800.00	3,200.00	1,500.00	8,400.00	33,964.97* (2)	8,589.87 (3)	$ 116,278.00

(1)

(1) Balance of $ 1,280.33 transferred for use in repairing Potomac Dam in 1832.

(2). An additional cost overrun of $ 2,149.89 for machinery was charged to the canal account.

(3) Of the $ 8,589.87 appropriation, only $ 2,610.15 was for storehouse at Musket Factory, the balance was for repairing officers quarters, paving streets, wells.

During the years 1830 to 1835, the Armory(including the John H. Hall Rifle Factory) erected a total of approximately 37 new buildings, as follows:

Division of Armory	No. Built	Approximate Cost
U.S. Musket Factory shops:	10	$ 27,846.03
U.S. Rifle Factory Shops	8	2,872.85
U.S. Arsenal Square Bldgs.	2	1,700.00
Powder Magazine, Camp Hill	1	131.33
Armory Dwelling Houses	16	14,586.40
TOTAL:	37	$ 47,136.61

Status of the U.S. Plant and Value of the Bldgs., 1821 and 1831:

The National Armory Account report, submitted annually, begining in 1822, was continued until 1831. Data drawn from the last two reports for the years 1830 and 1831 is Presented below:[1]

Year	For Construction	For Repair	For Land	C.&. R. Total	No.New Bldgs.
1830	$ 14,431.93	0	0	$ 14,431.93	2
1831	$ 18,117.08	$ 120.25	0	$ 18,237.33	6
1798 to 1831	$ 364,167.78	77,006.14		$ 441,173.92	1821 to 43 1831

Armory Expenditures, 1830-31 for:					At Rifle Factory
Year	For Buildings	For Canals and Dams		C & R. Total	For Bldgs, Canals, Dams
1830	$ 4,718.31	$ 9,713.62		$ 14,431.93	$ 887.45
1831	$ 13,445.56	$ 4,791.77		$ 18,237.33	$ 2,491.27
Subtotal	$ 18,163.87	$ 14,505.39		$ 32,669.26	$ 3,378.72
1798-1831	$ 217,920.74	$ 145,117.68		$ 405,915.70	$ 24,947.44

1. National Archives Record Group 156, Entries 935 and 936, National Armory Accounts, 1794-1831, copies in HF NHP Photostat Collection. Entry 936 on HF NHP Microfilm Reel 20, Vol. 5, pp.419 and 436.

2

CHART No. 13- VALUE OF THE ARMORY PLANT, 1821 and 1831

Value of Plant in 1821 and 1831	ARMORY		RIFLE FACTORY (3)	
ARMORY	1821	1831	1821	1831
Number of buildings	113	180	2	15
Value of Buildings	$ 150.650.00	$ 217,920.74	$ 4,130.14	$ 31,215.30
Value of Canals, dams	$ 105,000.00	$ 145,117.68	0	$ 4,599.50
Value of Plant:	$ 255,650.00	$ 363,038.42	$ 4,130.14	$ 35,814.80
Value of Machinery	$ 72,247.44	$ $ 77,554.43	$ 11,917.03	$ 149,410.89
Value of Land, 1.890 acres	$ 42,877.28	$ 42,877.28	0	0.
TOTAL:	$ 370,774.72	$ 405,915.70	$ 16,047.17	$ 185,225.69

Construction and Repair, U.S. Musket Factory, 1830- 1835:

According to the National Armory Accounts and report for the year 1830, the Harper's Ferry Armory spent a total of $ 14,431.93 for repairs and improvements during the year. Of this total, $ 10,713.62 were expended for erecting stone walls, earth embankments, and widening the Musket Factory Canal, $ 1,247.99 for Armory dwelling houses, $ 100 for fencing, 16.30 for digging wells, and $ 2,354.02 for improvements at the Musket Factory . At the Musket Factory $ 947.86 went for making new machinery, $ 1,210.84 "for making new forebays, chutes, &c" for the old water shops, and $ 195.32 for constructing two new small buildings: " one small building attached to finishing shop (our Bldg. No. 2, the Finishing or Bell Shop on Map. No. 4(1834)) & fixtures for Grindstone," for $ 152.00 and $ 43.32 "for making Scrap Iron House." [4]

The old forebays, built of wood, were replaced by new ones of wood in 1830. Carpenters Isaiah Frazer and Robert Ensworth were working on the forebay project in June 1830. [5]

2. National Archives Record Group 156, Entry 935 and Entry 936.
3. Congressional Serial No. 287, Document No. 44, p.66. Second auditor of Treasury W. B. Lewis's report, dated Nov.16,1835, of the expenditures at the Hall Rifle Factory from 1819 to December 31,1834.
National Armory Accounts for 1830, Record Group 156, Entry 936; HF NHP Reel 20, Vol. 5, p. 419, 421, Statements B, G, and H.
5. R.G. 217, 1st Series, File 14486, Voucher 71A to Frazer, June 5,1830, $ 31.00 for 31 days work; File 14486, Voucher 78A, to Ensworth, June 12,1830, $ 25.90 for 18½ days work.

During 1831 the annual report indicates that a total of $ 18,237.33 was expended for repair and improvements by the Harper's Ferry Armory.. Of this sum, $ 4,791.77 went for extending walls and embankments and widening the Musket Factory canal, $ 7,137.35 was used on Armory dwelling house projects, $ 131.33 went for erecting a new powder magazine, and $ 6,114.78 was used making repairs and improvements at the Musket Factory. The Musket Factory projects included $ 268.23 spent for making new machinery and $ 5,846.35 for erecting new buildings. Of the last item, $ 57.41 was utilized to "erect a new Hardening Furnace: and $ 5,789.04 "for erecting walls & constructing Machinery" from the Special Appropriation of $ 6,500.00 for "Erecting Forging Shop, Trip Hammer & New Work Shop." (A more detailed discussion of the construction funded by the Special Appropriation fund follows below).[6]

On August 7,1832, Superintendent George Rust, Jr, requested permission of Col. George Bomford, Chief of Ordnance, to convert a brick dwelling house standing on the northeast corner of Arsenal Square into an office for his use and also to construct a new storehouse for stocks at the Musket Factory, writing:

" I would be pleased you would authorize the erection of the Stock House & dwelling house, chargeable to Permanent Improvements."[7]

Col. Bomford granted permission on August 13, 1832, specifying:

You are authorized to erect and repair the buildings specified, and to pay for the same out of the appropriation for permanent improvements at the Armory- taking care that your estimate for these objects is exceeded as little as possible, viz.

For the erection of a new Stock House, about 65 by 30 feet	$ 800.00
For repairing a dwelling house to be used as an office, and the erection of another 28 by 20 feet.....	900.00
Total:	$ 1,700."

[8]

6. National Armory Accounts for 1831, R.G. 156, Entry 936, HF NHP Reel 20, Vol. 5, pp. 436, 437, and 436, Statements C, D, E, and F,
7. Rust to Bomford, Aug. 7, 1832, HF NHP Reel 22, Vol. 13, p.1255.
8. Bomford to Rust, Aug. 13,1832, HF NHP Reel 14, Vol. 4, pp. 867 - 868.

The new stock house was apparently constructed in 1832-33 and was located at the western(upper) end of the northern line of Musket Factory workshops, adjacent to the south bank of the Potomac River and about opposite to the new(1834) Carpenters Shop, new (1834) Machine Shop, and new(1831) Grinding Mill, which stood at the western end of the southern line of Musket Factory Shops, on the north bank of the Armory canal. (See Map No. 8 (1848)- Bldg. No. 12- Old Stock House and Bldgs. No. 7, 8, and 9 on same Map.) Page 184. (A)

Construction of Musket Factory Buildings from Special Appropriation Funds:

1. Grinding Mill, 1831:

In "Estimates for additional appropriations for the service of the Ordnance department for the year 1830," dated November 30,1829, $ 2,500 was requested "For erecting a new workshop" for the national Armory at Harper's Ferry.[1] This requested amount was appropriated by Congress in an act that was approved on May 31, 1830.[2] The vouchers issued by the Paymaster of the Armory reveal that construction on this new structure, which proved to be a grinding mill (Bldg. No. 9 on Map No. 8(1848)), got underway in the second quarter of 1831 and the building was completed by the end of that year. The new shop was located at the far western(upper) end of the southern line of Musket Factory shops and stood on the north bank of the Armory canal.

The stone foundations and wall of the new grinding mill were constructed by the mason John Gust, the carpenter James Foley roofed the structure, and the slater William Bayley slated the roof. Total cost of constructing the new grinding mill, exclusive of its water wheel and machinery, appears to have been about $ 2,438.45. Details of construction are given on the following chart.

1. : . American State Papers, Military Affairs, Vol. IV, p.191.
2. U.S. Statues at Large, Vol. 4, p. 424.

(A) The Old Stock House for Musket Stocks, which served the Musket Factory, had been erected by Superintendent James Stubblefield at a cost of $ 1,000.00 in 1822. The wood and stone structure stood in Arsenal Square, on the east boundary line and on the north side of the main gate to that square.(See Map 4(1834),p.122.

1831 Construction of New Grinding Mill, Musket Factory (R.G. 217-1st Series,

Date	Paid	Builder	Services Rendered	File No.	Voucher NO.
2nd Qr.	$ 21.68	John Gust	For 28½ days excavation of stone from raceway of new stone grinding mill.	15603	2nd qr.
2nd Qr.	53.80	John Gust	For 260 cubic yards excavation.	15603	2nd qr.
2nd Qr.	86.75	Lewis Wernwag.	Mason- "for work at new grinding mill	15603	2nd qr.
2nd Qr.	21.00	John Gust	for excavating stone	15603	2nd Qr.
Subtotal	$ 183.23	2nd Quarter 1831		15603	2nd Qr.
9/30	802.88	John Gust	for erecting 211½ perches of stone dry wall and laying 233 perches of mortar masonry wall. Grinding mill.	15936	19
9/30	311.05	William Bayley	For furnishing and slating 2,970 feet of roof of new grinding mill.	15603	19
9/30	26.88		For lumber	15603	
Subtotal	$ 1,661.09	3rd Quarter	for grinding mill	15603	
10/22	65.00	James Foley	For 52 days of carpenter work of self and 2 hands at the new grinding mill.	16094	4th qr.
Total:	$ 2,438.45	for new grinding mill in 1831:			

This shop replaced the original grinding mill of the Musket Factory, a one-story brick building 85 by 40 feet located on the Lower Hall Island in the Shenandoah, which had been built in 1808-09 and turned over to John H. Hall for the manufacture of rifles in 1827.

The appropriation of $ 2,500 for constructing the new grinding mill had been just about exhausted by December 31, 1831. The building, however, lacked a water wheel and machinery. On January 14,1834, Supertinendent George Rust, Jr. entered into a contract with Charles C. Starbuck to provide cast iron water wheel for use in an unspecified workshop. Starbuck agreed to manufacture "a five foot reaching water wheel with the necessary shafts, drum, frames, supports, gearing, and fixtures complete (except the forebay and race,which are to furnished by the Government), " for the sum of $ 2,980.00. The contract further specified that the wheel was to be ready for operation by August 25,1834.[3]

As construction did not even get underway on the new Tilt Hammer shop at the Musket Factory site until the summer of 1834, it appears likely that this five-foot cast iron water wheel was intended for use in the new grinding mill that had been largely finished in December 1831.

If this theory is correct, then the total cost of constructing the grinding mill, including water wheel and machinery, was about $ 5,480.00.

A Fire in a Musket Factory Workshop), 1832:

On September 15, 1832, the wood shingle roof of one of the three forging or blacksmith shops at the Musket Factory caught fire. The roof and interior woodwork were destroyed, but due to the fast work of the firemen and workmen, the walls of the building and the tools were saved.[4]

In the third quarter of 1831, the slater William Bayley received $ 150.00 "for repairing roof of Master Armorer's Office"(Bldg. No. 4 on Map 4(1834) and Bldg. No. 4, Map No. 7(1844)), indicating that the roof of this shop which had been erected in 1799 had been slated prior to 1831.[5]

5.R.G. 217, 1st Series, File 15936- 3rd quarter of 1831.

3. Contract Book No. 13, p.224; HFNHP Photostat Collection, Vol. 1, p.27.

4. For contract see Appendix No. 6.

Virginia Free Press, September 20,1832, p. 3, column 4, Reel 22, Vol. 13, p. 1260 has Superintendent George Rust's report to the Ordnance Department on this fire.

2. The Forging and Trip Hammer Shop,

In "Estimates for additional appropriations for the service of the Ordnance department for the year 1830," dated November 30,1829, $ 4,000 was requested " for erecting a forging shop and tilt-hammer" at the national armory at Harper's Ferry.[1] Congress appropriated the desired sum on May 31, 1830.[2] The War Department accountants placed this $ 4,000 plus $ 2,500 also appropriated for building a "new workshop(the grinding mil)" into a single account of $ 6,500 entitled "Erecting a Forging shop, tilt hammer, and new workshop" account. The co-mingling of the moneys of two projects in the single account somewhat clouds the progress of construction on the two structures. Work on the two building apparently got underway in 1831. Statement F "Statement of the Amount expended in erecting 'Forging Shop, Trip hammer & & new workshop' during the Year 1831,", part of the National Armory Accounts for the year 1831, reports that a total of $ 5,789.04 was spent "for erecting walls & constructing machinery."[3] No effort was made, however, to indicate how much was spent on each project. As approximately $ 2,438.45 was expended to erect and largely complete the new grinding mill in 1831, it would appear that the balance of $ 3,350.59 went either to construct the new Forging Shop, or the machinery for this or the new grinding mill.

The Armory Paymaster's Accounts with the Second Auditor of the Treasury Department, on the other hand, indicates, that only $ 3,744.63 was expended from this fund during 1831[4]. If this total is correct, then only $ 1,306.18 was spent on the construction of the Forging Shop and trip hammer in 1831. The reason for the difference between the two reports is unknown.

1. American State Papers, Military Affairs, Vol. IV, p. 191.
2. U.S. Statues at Large, Vol. 4, p. 424.
3. National Armory Acounts for 1831, R.G. 156, Entry 936, HF NHP Reel 20, Vol. V, P. 438.
4. National Archives R.G. 217, 1st Series, Files 15260, 15603, 15936, and 16094.

At this point, we follow the accounts of the Armory Paymaster and assume that only $ 1,306.18 was expended in 1831 to start construction of the forging shop and trip hammer, thus leaving a balance of $ 2,755.37 available for further construction on January 1, 1832. During the 1st two quarters of 1832 an additional $ 710.96 was charged against this account and then all construction halted for a two year period! The approximate total amount spent on the construction of the forging and trip hammer shop site from 1831 to 1832 thus appears to have been $ 2,017.14, leaving a balance of $ 2,044.41 from the orginal total of $ 6,500.00 in the account available for further construction. The work of the mason John Gust, who was also constructing the new grinding mill in 1831, appears to have been charged in 1831 for the forging shop account for whatever work was done on that latter shop.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

ERECTING A FORGING SHOP, TILT HAMMER & GRINDING MILL 1830- 1835. Appropriated $ 6,500 in 1830 and $ 13,300 in 1833

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a 0	b 0	c 0	d 0	0	6,500.00
1831	e 0	f 712.46	g 1,661.09	h 1,371.08	3,744.63	2,755.37
1832	i 707.52	j 3.44	k 0	l	710.96	2,044.41
1833	m 0	n 0	o 0	p 0	0	2,044.41
1834	q 0	r 0	s 1,540.28	t 3,419.53	4.959.81	5,084.60
1835	u 235.10½	v 2,198.28	w 3,828.04	x 2,278.77	8,540.19½	1,844.59
TOTAL					17,955.59	1,844.59

File Nos.

e. 15260
f. 15603
g. 15936
h. 16094
i. 16388
j. 16657
k.
1/ 17153
m. 17163
n. 17644
o. 17895
p. 17895
q.
r. 18712
s, 19021
t. 19257
u. 19514
v.
w. 20041
x. 20281.

As was described in the last chapter, a total of $ 3,496.46 was expended on the construction of the foundations of the tilt hammer shop in 1828-29, so that the cost of erecting the forging shop, trip hammer stood at about $ 5,513.60 as of December 31, 1832 and the work shop was still incomplete.

In the estimates for 1833, Col. George Bomford, Chief of Ordnance asked Congress for $ 13,300 "to complete the forging shop, tilt hammer, and new workshop."[5] Some of this money was needed to built the water wheel and machinery for the new grinding mill, but most of it was required if the forging shop, on which only a begining had been made, was to be completed. Col. Bomford informed Congress that the construction of "a tilt hammer shop for welding barrels" was greatly needed at the Harper's Ferry Armory and would considerably reduce the cost of manufacturing arms., writing in part:

> "The great difficulty that has been experienced at this (Harper's Ferry) Armory in obtaining the necessary number of gun barrels, renders the erection of a tilt hammer shop for welding them, a matter of much importance. At present all the barrels are welded by hand, in doing which three persons are employed at each furnace, and the sickness or temporary absence of one of them, stops the employment of the other two. The cost of welding barrels at this Armory is 72 cents, whilst at the Springfield Armory, but 39 cents are paid, where they have the advantage of a tilt hammer."

Assuming that the Harper's Ferry Armory produced 12,000 muskets a year, the annual savings, if the tilt hammer shop was available, would amount to about $ 4,200, Bomford estimated.[6]

Congress appropriated the desired sum on March 3, 1833.[7] The Paymaster's accounts reveal that construction resumed on the tilt hammer shop for welding barrels during the third quarter of 1834 and continued until the end of 1835,

5. HF NHP Reel 20, Vol. 6, p.576. National Archives R.G. 156, Entry 129, Vol. 1, p. 110.
6. Ibid.
7. U.S. Statues at Large, Vol.4, pp.641-642.

with the following sums being expended annually:

$ 1834	$ 4,959.81
1835	8,540.19½
Total:	$ 13,500.00½

Leaving a balance available in account on January 1,1836 of $ 1,844.59.

Total expenditures on this project from 1830 to 1835 amounted to $ 17,955.59; with the 1828-29 construction costs included, the total stood at $ 21,452.05. Of this sum about $ 2,438.45 appears to have been spent on erecting the new grinding shop in 1831, and approximately $ 19,013.60 on constructing the forging shop, trip hammer.

Correspondence of the Ordnance Department in 1836 reveals that of the approximate total of $ 19,013.60 spent on the tilt shop from 1828 to 1835, about $ 5,513.60, spent from 1828 to 1832 was used to construct foundation walls of the workshop at the wrong site! That is, in 1834 the original 1828-29 site of the building was changed to a much more favorable location and construction at the new site had to begin from the ground up. The $ 5,513 spent erecting stone foundation walls at the 1828 site should probably have been charged against the Armory canal project for extending walls and embankments, at least in the final outcome.

In a letter dated November 3,1836, Lt. Col. George Talcott, Inspector of Armories and Arsenals, explained the status of the tilt hammer shop project to Col. Bomford, writing:

> The Tilt Hammer works are still unfinished and it would be difficult to predict when they will be completed even if sufficient funds are provided... The several sums of money authorized to be expended heretofore have been entirely insufficient for its completion, on account of the very great cost of the new canal or raceway, which has absorbed a large portion of the funds - or rather the change of location and extension of the canal to the new site (in 1834), made it necessary to incur heavy additional expences for the foundations and high walls. The change was judicious and the error consists in not making proper estimates and statements in due time to have the money appropriated by law. About six thousand dollars will be required to complete the work from the present condition... 8

8. Harpers Ferry National Historic Park Photostatic Collection, Vol. 1, pp. 62-63, Inspection report of Nov. 3,1836, National Archives R.G. 3 material.

On December 31, 1835, then, a total of $ 13,500.00½ had been spent in 1834-35 erecting the trip hammer shop for welding barrels at the "correct" and final site. This is Bldg. No. 11 ,"the Barrel Welding and Tilt Hammer Shop" on Map No. 8 (1848). On January 1, 1836, the stone shop was perhaps two-thirds complete, $ 1,844.59 was still available in the account for further construction, but as we shall see in the next chapter, it was necessary to request an additional appropriation of $ 6,459.00 in 1837.

Turning to the 1834-35 construction of the tilt shop, Superintendent George Rust,Jr., who had become superintendent of the Harper's Ferry Armory in April 1830, entered into four contracts with masons, carpenters, slaters, and millwrights to erect the structure. In the first contract (see Appendix No. 8), dated May 28, 1834, the Mason Johnson Garrett agreed to perform the mason work on the shop. This included excavation for the foundation, the construction of the stone mortar foundation walls and also the upper walls. Garrett was to be paid for erecting mortar stone walls at the rate of $ 1.50 per perch; $ 1.25 per perch for dry wall; 25 cents per cubic yard for " plain excavation" of earth, and $ 1.00 per cubic yard for "Rock excavation." Garrett agree to begin construction by July 1, 1834 and to continue work without interruption until either the structure was completed, or the weather stopped the work.[9]

Garrett commenced construction in accordance with the terms of his contract and at the end of the third quarter of 1834 was paid $ 1,540.28 for erecting 1,002 perches of mortar wall.[10]

9. National Archives Record Group 156, Chief of Ordnance Contract Book No. 13, pp.221-222. HFNHP Photostat Collection, Vol. L, pp.28-29.

10. R.G. 217-19021- Forging Shop Abstract Acount He was paid $ 501.00 for erecting 334 perches of wall on August 21; $ 501.00 for 334 perches on Sept.9; and $ 501.00 for 334 perwhes on Sept.29,1834.

During the fourth quarter of 1834 Johnson Garrett was paid $ 3,419.53 from the "completing forging shop, tilt hammer"account for the following work:

Date Paid	Payment	Service Rendered
10/18	$ 600.00	For erecting 400 perches of stone wall.
10/25	451.26	For 1,806 cubic yards of embankment. (Along canal)
11/ 7	684.50	For 365 cubic yards of rock excavation and 548 cubic yards of earth excavation.
12/7	794.61 79.57 3.00 35.75	For 529 74/100 perches of stone wall. For 63 2/3 perches of dry wall. $ 912.93 12/6. For two arches. For setting 286 feet of cornice.
4th Quarter 1834 Total:	$ 3,419.53	To Johnson Garrett 11

The mason Johnson Garrett, all told, received a total of $ 4,959.71 for his construction on the tilt hammer shop for welding barrels account in 1834. The foundations and one-story high walls of this building were apparently completed by December 1834.

Garrett returned to complete forebay and wasteway of the new shop in the fall of 1835, receiving a total of $ 569.97 for the following work:

Date	Payment	Service rendered
3rd Qr.	$ 137.06	Completion of Forging Shop, Tilt Hammer. 12
11/20, 1835.	275.00 157.91	For 1,100 cubic yards of embankment. For 64½ days labor puddling at the forebay and wasteway of the new tilt hammer shop. 13
1835 Total:	$ 569.97	To mason Johnson Garrett

Johnson Garrett thus collected at least $ 5,529.68 for his role in erecting the tilt hammer shop for welding barrels in 1834-35.

11. R.G. 217, 1st Series, File 19257-Abstract C- Forging Shop Account.
12. R.G. 217 1st Series, File 20041 Abstract B- 3rd Quarter 1835.
13. R.G. 217- 1st Series,File 20281 Abstract B, 4th quarter 1835.

On September 1, 1834, Superintendent George Rust, Jr. entered into a contract with James Foley which provided "for erecting the Joiner and Carpenter's work of the tilt hammer shops now erecting at the Armory."[14] This contract provided for framing the roof, making window and door frames, window sash, venetian blinds, batten doors, lintels, and sheathing the roof. The building, however, was apparently not ready for carpenter work until 1835. On March 31,1835 Foley was paid a total of $ 60.00 from the Forging Shop Account for making 68 door and window frames, 44 lintels, and 807 sash of light for the structure.[15] During the 3rd quarter of 1835 Foley received $ 198.79 for framing 5,524 feet of roof, making 1,968 feet of sheathing, 292 feet of cornice, 8 windows frames, 1303 sash.[16] During the final quarter, Foley was paid $ 45.20 for framing the roof, 3,168 feet, and for raising the roof plate 280-feet.[17] James Foley received at least $ 204.79 for his carpenter work on the tilt hammer shop at the Musket Factory in 1835.[18]

14. N.A. R.G. 156-Chief of Ordnance Contract Book, No. 13, p.223. HFNHP Photostatic Collection, Vol. 1, pp.32-33. See Appendix 9 for a copy of James Foley's contract.
15. R.G. 217- File 19514- Abstract E.
16. R.G. 217- file 20041- Abstract B.
17. R.G. 217- File 20281-Abstract E.
18. The vouchers for the 2nd quarter of 1835 are missing, so that Foley may have earned additional money during that period for which individual records are no longer extant.

Superintendent George Rust,Jr. made a third contract with William Bayley on January 10, 1835 which provided for the slating of the Carpenter's and Machine Shop and of the tilt hammer shops "now being erected at this Armory." Bayley was to furnish all the slate, which was to be "American", and other materials required and was to be paid at the rate of $ 9.00 for every hundred feet.[19] The Paymaster's vouchers for 1835 indicate that Bayley, who slated other Armory structures during the year, did not slate the roof of the trip hammer shop, probably, as the record of carpenter work indicates, the roof was not ready to be slated until early 1836.

Also on January 10, 1835, Superintendent signed a fourth contract regarding the new trip hammer shop. Under this agreement Jacob Apsey agreed to perform all the millwright work on the new shop, which included the construction of all necessary wooden forebays and water wheels.[20] Apsey was at work in the new shop by the 4th quarter of 1835 and received $ 329.25 for his services,which included making a wooden water wheel that was twenty feet in diameter.[21] Apsey, however, was just beginning his work, which was to continue through the third quarter of 1836.

19. N.A. R.G. 156- Contract Book 13, p.220-HFNHP Photostat Collection, Vol. 1,p.38. See Appendix 11 for slating contract.
20. Ibid. Contract Book No. 13, pp.226-227-HFNHP Photostat Collection , Vol. 1, p.36-37. See Appendix 10 for Millwright contract.
21. R.G. 217,-File 20281- Abstract E. The charge for making the water wheel was $ 120.00.

Footnotes 22, 23, and 24 deleted.

On April 27,1835, Master Armorer Benjamin Moor, serving as acting superintendent, signed a fifth contract relating to the tilt hammer shop. Under this agreement Charles C. Starbuck contracted to provided five "Reacting Water wheels complete including cast Wheels, Gates and every other iron Fixture belonging thereto for the use of the Tilt Hammer shop now being put in operation at said Armory." Starbuck warrented that these wheels would run at 150 revolutions per minute with "eight feet back water or in other words, warrents that one half of the apertures of said wheels shall be sufficent to drive the Tilt Hammer attached thereto at a speed of seven hundred strokes per minute with a full head of water." The armory agreed to pay $ 310.00 for each wheel, making a grand total of $ 1,550.00 due for the five wheels.[25]

During the 3rd and 4th quarters of 1835 Starbuck was paid a total of $ 1,033.33 of the total due for the five iron wheels.[26] This evidence stuggests that the new trip hammer shop was to have 5 iron and one wooden water wheels. (See Appendix 7 for copy of contract.)

During the 3rd quarter of 1835 the following additional sums were spent towards the construction of the shop:

$ 948.80 to Charles Reeder"for casting", apparently machinery for shop.

$ 55.39 to William Brown "for painting."

$ 1,418.76 for "materials"

$ 7.97 to Samuel Russell for timber.

$ 5.14 to Joseph L. Smith for Locust Posts"[27]

25. Contract Book 13, p. 232; HFNHP Photostat Collection, Vol.1, pp.40-41.

26. R.G. 217- 20041- Abstract B, $ 310.00 on July 31,1835; File 20281- Abstract E, paid $ 555.37 plus $ 167.96= $ 723.33.

27. R.E. 217- file 20041, Abstract B.

Thus by December 31, 1835, as has been noted, a total of $ 13,500.00½ had been expended in erecting the tilt hammer shop for barrel welding in 1834-35 at the final site. The stone foundations and stone upper walls were complete. The carpenter work, including the framing of the roof, were also finished by the end of 1835, but the roof had not yet been slated. Contracts to slate the roof and also construct one wooden 20 foot water wheel and five cast iron water wheels had been let . Millwright work on the forebays and wheels was in progress by the end of 1835. The balance available for further construction on December 31,1835 was $ 1,844.59, but as we shall see in the next chapter, an additional appropriation of $ 6,459/00 had to be made in 1837 before the tilt hammer shop could be completed.

The tilt hammer shop was the first large workshop to be constructed at the Harper's Ferry Armory since 1809-10.

3. Repair of the Old Workshops,1830-35:

In the"Estimates for additional appropriations for the service of the Ordnance department for the year 1830;" dated November 30, 1829, the sum of $ 3,200 was requested "For slating roofs of present workshops."[1] Congress appropriated this desired amount on May 31, 1830.[2] The records of the Armory Paymaster indicate that work on the project of replacing the wood shingle roofs of the workshops with slate did not get underway until the 4th quarter of 1832 and was completed in the 2nd quarter of 1833. A total of $ 3,013.42 was expended in 1832-33 and a balance of $ 186.58 was carried forward and not spent until 1838.[3]

1. American State Papers, Military Affairs, IV, p. 191.

2. U.S. Statues at Large,Vol. IV, p. 424.

3. R.G. 217, 2nd Series , File 2364, for the 2nd Quarter of 1838.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor: from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

SLATING THE ROOFS OF WORKSHOPS. 1830- 1835. $ 3,200.00 appropriated in 1830.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a	b	c	d	0	3,200.00
1831	e	f	g	h	0	3,200.00
1832	i 0	j 0	k 0	l 380.48	380.48	2,819.52
1833	m 94.15	n 2,538.79	o 0	p 0	2,632.94	186.58
1834	q 0	r 0	s 0	t 0	0	186.58
1835	u 0	v 0	w 0	x 0	0	186.58
TOTAL					3,013.42	186.58

l. 17153
m.
n. 17163
o. 17895
p. 17895
x. 20281.

The slating was done by William Bayley and it included work on the roofs of both Musket Factory and Rifle Factory shops.[4]

b. Repairing the Walls of Four Brick Workshops.

The estimates for 1833 requested and Congress provided $ 1,500.00 on March 2, 1833 for "Repairing the walls of four workshops."[5] The money was to be used to repair the brick walls of four Musket Factory shops that had cracked, and, or, settled. The work on this project was completed during the third quarter of 1833 at a cost of $ 849.95. The balance of $ 650.05 was carried forward on the Armory books and finally expended in 1838.[6]

6. For use in 1838, see R.G. 217- 2nd Series, File 2729.

4. R.G. 217, 1st Series, File 17153- $ 2,538.79 was paid to Bayley during the 2nd Quarter of 1833.

5. Estimates for 1833 in HFNHP Reel 20, Vol. 6, p. 576. U.S. Statues at Large, Vol. 4, p. 642.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements
REPAIR OF WALLS OF FOUR WORKSHOPS 1830- 1835. $ 1,500.00 appropriated in1833.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a	b	c	d		
1831	e	f	g	h		
1832	i	j	k	l		
1833	m 0	n 0	o 849.95	p 0	849.95	650.05
1834	q	r	s	t	0	650.05
1835	u	v	w	x	0	650.05
TOTAL					849.95	650.05

File No. - Lst Series.
o. 17895
p. 17895
x. 20281.

c. Constructing Three New Water Wheels for Three Old Shops:

The Ordnance Department asked for $ 8,400.00 in the estimates for 1833 for constructing three new wooden water wheels and their necessary machinery in the turning, boring, and stocking shops and for also sinking flumes for these wheels.[1] Congress appropriated the requested amount on March 2, 1833.[2]

The turning or finishing or Bell Shop, erected in 1809-10, is Bldg. No. 2 on Map 4 (1834); the boring mill, erected in 1799 is Bldg. No. 3 on Map 4, and the stocking shop, constructed in 1809-10 , is Bldg. No. 5 on Map. 4.

1. Reel 20, Vol. 6, p. 576.
2. U.S. Statues at Large, Vol. 4, p. 642.

Col. George Bomford, Chief of Ordnance, had explained the need for this project to Congress, as follows:

> the water-wheels and machinery (generally) are so much worn and decayed as to require very frequent repairs. The expenditure for which per annium far exceeds the interest on the sum sufficient to renew them permanently - Much of the machinery is very imperfect and the loss of time sustained by the workmen for the want of the necessary power to propel the machinery causes the cost in fabricating some of the component parts of the musket to be much greater than it would be were the machinery improved and sufficient power acquired to drive all the requisite machinery at the lowest stage of the waters.. [7]

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

Three New Water Wheels for the Boring, Turning, and Stocking Shops. 1830- 1835. $ 8,400 appropriated in 1833

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a	b	c	d		
1831	e	f	g	h		
1832	i	j	k	l		
1833	m	n 48.75	o 3,699.38	p 2,546.62	6,294.90	2,105.10
1834	q 1,535.58	r 251.80	s 0	t 0	1,787.38	317.72
1835	u 0	v 0	w 0	x 0	0	317.72
TOTAL					8,082.28	317.72

File No. - 1st Series:

n. 17163
0. 17895
p. 17895
q. 18712
r.
s. 19021
t. 19257
u. 19514
v.
w. 20041
x. 20281.

7. Estimates for 1833, Reel 20, Vol. 6, p. 575.

Work on building the three water wheels got underway in the third quarter of 1833 and by the end of that year, $ 6,294.90 had been expended; during 1834 an additional $ 1,787.38 was utilized, thus making a grand total of $ 8,082.38 spent on the project from 1833 to 1835. The balance of $ 317,72 was carried forward on the Armory Paymaster's books and not used up until 1838.[8]

Masons and millwrights working on this project in the fall of 1833 included the following men.

R.G. 217-1st Series, File 17895

Date Paid	Payment	Builder	Service
10/11/33	$ 142.00	Martin Cotter.	Mason work, laying 284 perches of stone at Wasteway of three shops.
11/30/33	$ 184.45	Lewis Wernwag ,	Mason work, laying 105 4/10 perches of stone wall.
12/31/33	137.55	Lewis Wernwag	for laying 78 3/5 perches of stone wall
10/11/33	$ 292.66	Charles C. Starbuck	Millwright work, towards constructing three new water wheels for three shops.
Total:	$ 757.66		468 perches of stone wall.

The money for this project was virtually exhausted by the 1st quarter of 1834 and it was apparent that additional funds would be required. Accordingly, item No. 1 of the estimate for 1834 asked for an appropriatio of $ 26,040,47 for "the completion of the machinery in the turning, boring, and stocking shops." In justifying this large amount, Col. George Bomford explained to Congress:

"The Superintendent reports, in regard to this item, that it has been discovered, in attempting to introduce one of the new water wheels intended for

8. R.G. 217, 2nd Series, File No. 677, 761, and 2364. Some of the money was used in 1836 and the last in 1838.

"the Boring Mill (Bldg. No. 3 on Map No. 4), that the cost of the wheel, as well as the forebay, and tail race, will very far exceed the appropriation of 1833 (in the amount of $ 8,400) for these purposes..."[9] Congress appropriated the desired $ 26,040.47 on May 14, 1834.[10] (See Chart No. 14, page 118).

Lumped in this same account was $ 10,074.39 earmarked for three other projects and making a grand total of $ 36,114.86 in the combined account.

Expenditures in 1834-35 from this fund of $ 36,114.86 totaled $ 27,166.54 and the balance of $ 8,948.32 that was carried foreward, was finally used up in 1839.[11] Expenditures in 1834-35, however, were as follows:

1834:	$ 16,245.52
1835:	$ 10,921.02
Total:	$ 27, 166.54.

Masons, carpenters, slaters, and millwrights who were paid from this conbimed fund, 1834-35, and were apparently working mainly on the turning, boring, and stocking shops included the following men:

1. Lewis Wenbwag, $ 2,390.06 for mason work done during the 2nd and 3rd quarters of 1834.[12]

2. Johnson Garrett, mason,$ 220.69 for furnishing 441 33/100 perches of stone, 4th Quarter 1834.

3. Joseph F. Thompson, Mason, $ 479.35 for laying 271 perches of stone mortar wall, 4th quarter 1834.

4. John Grubb, mason, $ 288.23, for laying 441 38/100 of dry stone wall, 4th quarter, 1834.

5. William Bayley, slater, $ 538.56, for slating 59 84/100 squares of roof, 4th quarter, 1834.[13]

9. Estimates for 1834, Reel 20, Vol. 6, p. 588.
10. U.S. Statues at Large, Vol. 4, p. 675. The money was included as part of a lump sum of $ 36,114.86 that also included money for six other projects.
11. For 1839, see R.G. 217, 2nd Series, File 3971.
12. R.G. 217, Lst Series, File No. 18712 and 19021.
13. R.G. 217, 1st Series, File 19257.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

Completion of New Machinery 1830- 1835. $ 36,114.86 appropriated May 1834.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a	b	c	d		
1831	e	f	g	h		
1832	i	j	k	l		
1833	m	n	o	p		
1834	q 1,814.47	r 1,818.25	s 6,246.51	t 6,370.29	16,245.52	9,794.95
1835	u 1,917.93	v 4,748.50	w 3,324.65	x 1929.94	10,921.02	8,948.32
TOTAL					27,166.54	8,948.32

q. 18712
r. 19021
s. 19257
t.
u. 19514
v.
w. 20041
x. 20281.

For new Machinery: 26,040.47
For new Bldgs. 10,074.39
Total: $ 36,114.86

Item included in Appropriation:

1. Completion of the Machinery in the boring, turning, and stocking shops.....$ 26,040.47
2. for erecting an Annealing shop and proof house,(built in 1834)..... 1,872.36.
3. for erecting Carpenters' and Machine shop, built 1834..... 4,230.69
3. Two shops for tempering springs and polishing barrels, two houses for firecngines, and an addition to the Stocking Shop..... 1,821.45
Subtotal for 7 new shops: $ 7,924.50
4. For completion of the canal from Potomac Dam to Musket Factory(completed in 1834)..... 2,149.89
Total appropriated in 1834: $ 36,114.86

6. James Foley, carpenter, was paid a total of $ 181.55 for carpenter work performed during the the 4th quarter of 1834 and 1st quarter of 1835. During this period, as part of his work, he made one window frame and two batten doors.[14]

4. Building Program for Musket Factory Buildings, 1834 -1835:

In the estimates for 1834 the Ordnance Department requested $ 10,534.65 in funds to construct six new shops and storehouses, together with a flood guard wall at the Musket Factory.[15] Congress voted the desire amount on May 14,1834.[16]

$ 7,924.50 of the money earmarked for the construction of the following buildings was lumped in a account entitled "Completion of new machinery" and totaling $ 36,114.86 (See Chart No. 14, p. 118 for a breakdown of all projects):

1. For erecting an Annealing shop and proof house..... $ 1,872.36
2. For erecting Carpenters and Machine Shop..... 4,230.69
3. For erecting two shops for tempering springs and polishing barrels .

   For erecting two houses for fire engines

   For making addition to the Stocking Shop.(Bldg. No. 5 on Map No. 4 (1834)..... 1,821.45

Subtotal for six new shops and one addition, 1834: $ 7,924.50.

Also appropriated in May 1834 was $ 8,589.87 for five projects in a account entitled "Eerecting Storehouses,etc.", which included money for the following two Musket Factory projects:(See Chart 15, p. 120 for a breakdown of the five projects):

14. R.G. 217, 1st Series, File No. 19257 and 19514.
15. HF NHP Reel 20, Vol. 6, p.588.
16. U.S. Statues at Large, Vol. 4, p.675.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

1830- 1835. $ 8,589.87 appropriated in May 1834.

ERECTING STORE HOUSES (1)

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a	b	c	d		
1831	e	f	g	h		
1832	i	j	k	l		
1833	m	n	o	p		
1834	q	r	s 1,212.50	t 1,203.57	2,416.10	4,583.90
1835	u 86.03	v 0	w 1,349.61	x 163.11	1,598.75	4,575.02
TOTAL					4,014.85	4,575.02

s. 19021
t. 19257
u. 19514

v.
w. 20041
x. 20281.

Money appropriated in 1834 to

(1) erect Store House for Iron and coal Bin.....$1,710.15
(this built in 1834).
(2) repairing Paymaster's and Clerks' quarters..... 2,079.72
(3) Constructinga river wall on the margin of the Potomac to protect the public works..... 900.00
(4) for sinking three wells on Camp Hill..... 1,500.00
(5) for grading and paving Potomac Street between the public shops, and Shenandoah Street, and for painting some of the public bldgs. 2,400.00
($ 1,516.49 of this money was spent in 1834 for paving and grading street, leaving balance of $ 983.51 available for painting

Total Appropriation, 1834: $ 8,589.87

1.For erecting Store House for Iron and Coal Bin.....$ 1,710.15

2. For constructing a river wall on the margin of the Potomac to protect the public works..... 900.00

Subtotal: Storhouse account, 1834,for Musket Factory $ 2,610.15

Total, 1834, for construction of seven shops, one addition, and erecting a river wall..... $ 10,534.65

a. Carpenters and Machine Shop, 1834-35:

As has been noted, the Ordnance Department requested and Congress appropriated on May 14,1834 the sum of $ 4,230.69 "to erect a Carpenters' and Machine Shop."[1] Col. Bomford explained to Congress the need for this building, writing:

> The machine and carpenter's shop now used, are entirely too small, and when heavy turning is required, the stocking operations are impeded- the machinery being connected with that of the stocking mill. This building will also be occupied by the stockers when another shall have been provided for the carpenters and machinists." [2]

The stocking mill referred to above would be Bldg. No. 5 on Map No. 4(1834), p. 122.

The new shop was apparently constructed as two separate buildings: the Carpenters Shop, Bldg. No. 7 on Map No. 8(1848), and the Machine Shop, Bldg.No. 8 on Map No. 8(1848). Both shops had water wheels to power their machinery and were located near the western(upper) end of the southern line of Musket Factory shops, immediately east of the 1831 grinding mill and standing on the north bank of the Armory canal.

The masons apparently erected the stone walls of these one-story stone buildings, for on December 7, 1834, the carpenter Daniel T. Mathias received $ 100.00 for 66 2/3 days carpenter work on "the machine shop."[3]

1. Estimate for 1834, Reel 20,Vol. 6, p. 589. Appropriation in U.S. Statues at Large, IV, p. 675. The money for this building was included in the sum of $ 36,114.86 listed as for the completion of machinery.
2. Estimate, 1834, Reel 20, Vol. 6, p. 589
3. R.G. 217, 1st Series, File 19257.

MAP NO. 4

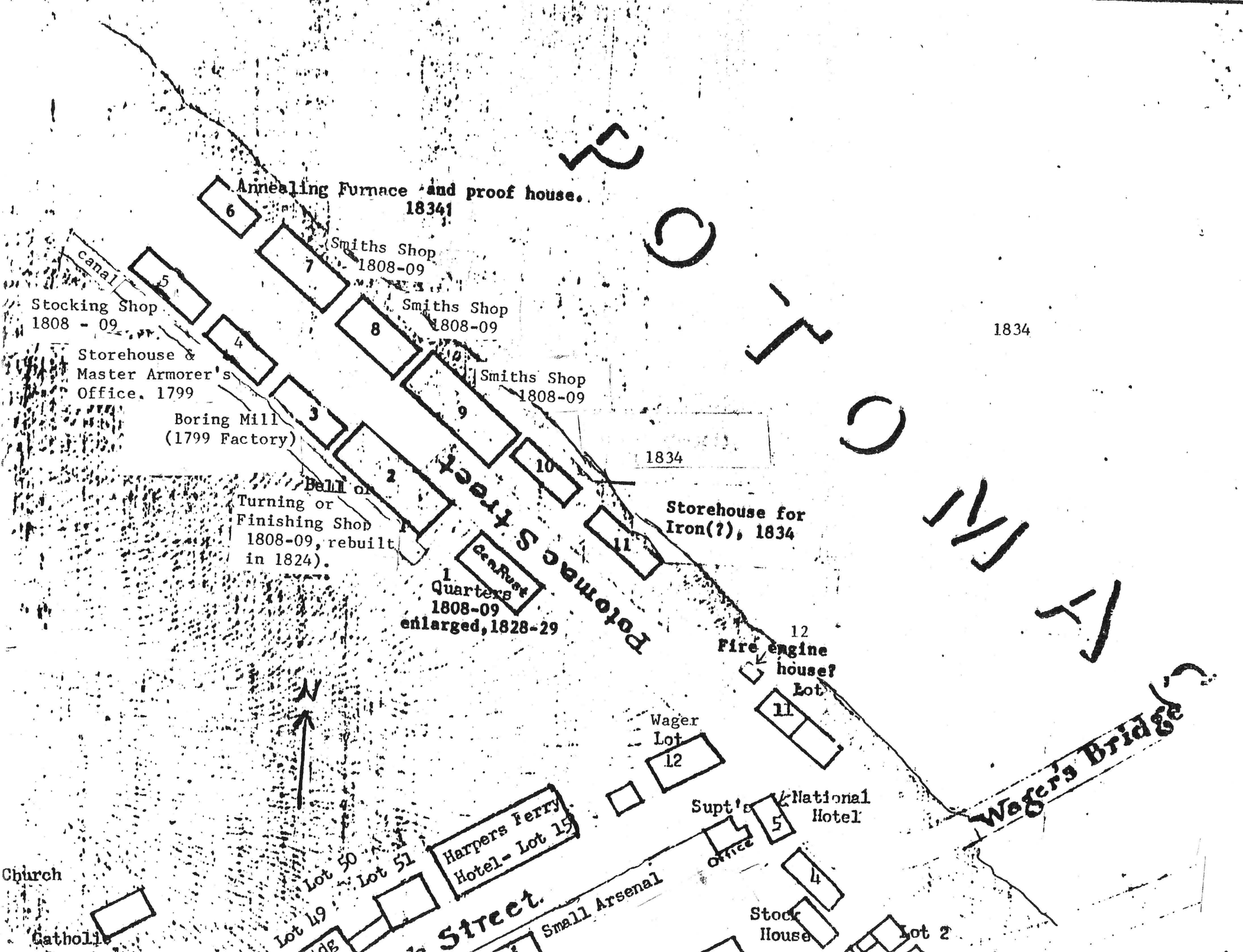
Map of Harper's Ferry Shewing the Location of the Winchester and Potomac Railroad, No. 2, Drawn by Lieuts. White, Allen, and R. S. Smith, U.S Army. Under the direction of James Kearney, Lt. Col. and T.E. Scale 100 feet to one inch. Approved by President Andrew Jackson, 27th January 1835.

National Archives Record Group 77, Records of the Office of the Chief of Engineers, Fortifications Map File, Drawer 150, Sheet 82, part 2, in Cartographic Division, National Archives, Washington ,D.C.

Data for this map was collected in 1834 and reflects conditions not later than October 1834.

Detail of section of map showing some of the shops and buildings in the U.S. Musket Factory along the Potomac River.

Extant Musket Factory Buildings not shown on this map, because they were located too far to the west (off the lower left hand corner of the plan), were the four following workshops: (1). The Grinding Mill, erected in 1831 at a cost of approximately $ 2,500.00; (2) The Carpenters' and Machine Shop, built in 1834 at a cost of about $ 4,200.00, (3) the great Trip Hammer Shop for welding barrels, 1834-35, about 2/3's complete at a cost of $ $ 13,500.00; and (4) The Stock House, about 65 by 30 feet and erected in 1832-33 at a cost of $ 800.



POTOMAC
Annealing Furnace and proof house.
1834
Smiths Shop
1808-09
Smiths Shop
1808-09
Smiths Shop
1808-09
canal
Stocking Shop
1808 - 09
Storehouse &
Master Armorer's
Office. 1799
Boring Mill
(1799 Factory)
Bell or
Turning or
Finishing Shop
1808-09, rebuilt
in 1824).
1834
1834
Storehouse for
Iron(?), 1834
Potomac Street
GenRust
1
Quarters
1808-09
enlarged, 1828-29
12
Fire engine
house?
Lot
11
Wager
Lot
12
Wager's Bridge
Supt's
National
Hotel
5
Office
4
Harpers Ferry
Hotel- Lot 15
Lot 50
Lot 51
Lot 49
Church
Catholic
Street.
Small Arsenal
Stock
House
Lot 2
N

During the 3rd quarter of 1835 Mathias received an additional $ 198.93 for his work " on the new machine shop". which included providing 1,729 feet of joists, 1,920 feet of girders, 2,640 feet of roofing, 1,729 feet of double flooring, making 54 lintels, and making seven batten doors for "new machine shop."[4] Also during the 3rd quarter of 1835 the mason John Grubb was paid " 27.58 for "trowel dashing (stone) walls of carpenter and machine shop, 441 38/100 perches."[5] The painter William Brown also received $ 11.04 in the fall of 1835 for painting 155.8 square yards "on new machine shop" and for glazing 23 lights.[6]

These two one-story stone shops were erected and completed in 1834-35.

Under a contract dated January 10,1835, William Bayley furnished and slated the roofs of "the Carpenter's and Machine Shops" with "American slate" at the rate of $ 9.00 for every one hundred feet of slating done. (See Appendix No. 11 for contract).

4. R.G. 217, 1st Series, File 20041. Abstract C.
5. Ibid.
6. R.G. 217, 1st Series, File 20041, Abstract D.

b. Store House for Iron, Steel, &c., and Bin for Coal, 1834-35:

The Ordnance Department requested and Congress appropriated on May 14, 1834 the sum of $ 1,710.15 "to erect a store house to contain iron, steel,etc. and for the construction of a bin to contain pit coal."[1]

This was needed, the Chief of Ordnance explaimed , because:

> The Iron house (an old stone building) now used as such is situated near the rifle factory (on the Shenandoah River), distant about half a mile, from the lower shops. It is designed to erect a permanent building in the immediate vicinity of the (musket factory) shops for an iron house, by which means the expense of transportation of the iron,(now very considerable) will be avoided, and the present building transferred to the rifle factory, for the benefit of which it is wanted.
>
> At present there is but one Bin for containing Pit-coal, at this Armory, which is not sufficiently capacious to hold much more than one half of the coal, usually on hand; the consequence of which is, that the coal is exposed on the bank of the canal, and large quantitites are doubtless lost to the Government, during the winter...

The store house for iron and pit coal was a brick building with stone foundations that was erected in 1834 at a cost of approximately $ 1,500.00. The vouchers of the Paymaster provide the following data on the construction of this store house.

1. Estimate 1834, Reel 20, Vol. 6, p. 589; Appropriation in U.S. Statues at Large, IV, p.675. The money for this building is included in the sum provided of $ 8,589.87.
2. Estimate, Reel 20, Vol. 6,p.589.

AStore House for Iron and Pit Coal, 1834. Record Group 217					
File No.	Abstract Letter	Artisan	Paid	Date	Remarks
19251	D	Johnson Garrett	$ 19.73	10/25/34	For excavating 157 86/100 cubic yards.
19251	D	John Grubb	$ 188.53	10/9/34	For laying 305.4 perches of stone wall and 79 feet of cornice.
18712	7	Josiah McMullen	$292.00	9/18/34	For laying 17,664 brick, 20 feet of brick cornice, 5 14 inches arches, 51 feet 2 inch cornice and 11 feet 14 inch cornice. Also for 12,022 brick @ $ 108.19/.
19251	D	" "	$ 166.45	12/31/34	For laying 266 3/10 square yards of brick pavement.
19251	D	" "	$ 51.37	12/6/34	For 34½ days work.
Subtotal:		Josiah McMullen	$ 516.82	1834	
19251	D	Daniel Mathias	$ 113.81	10/9/34	For 75 7/8 days of carpenter work.
19251	D	" "	$ 57.37	11/26/34	
Subtotal		Daniel Mathias	$ 171.18	1834	Carpenter work
19251	B	James Foley	$ 160.23	12/8/34	For carpenter work making 33 door and window frames, 33 lintels, 5 batten doors, amd 2,232 feet of flooring.
19251	D	Johnson Garrett	$ 103.58	10/25/34	For 207 17/100 perches of stone furnished.
19251	D	Jeremiah Harris	$ 20.12	10/28/34	For plastering 201½ square yards.
19251	D	William Bayley	$ 183.60	12/6/34	For slating 20 40/100 squares of roof.
19251	D.	John Kennedy	$ 24.82	12/7/34	For glazing 458 window panes and painting.
Approximate Cost, 1834:			$ 1,495.57	1834	

In the 3rd quarter of 1835 the mason John Grubb received $ 19.08 "for trowel dashing" 305 41/100 perches of the walls of the Store House for Iron.[3]

These walls may have been the stone foundations of the structure.

William Brown was also paid $ 137.47 for painting the store house in the 3rd quarter of 1835.[4] The Store House for Iron is probably either Bldg. No.10 or 11 on Map No. 4 (1834) p. 122.

3. R.G. 217- 1st series 20041- Abstract D.
4. Ibid.

c. Annealing Shop and Proof House, 1834-35:

The Ordnance Department requested and Congress provided on May 14, 1834 $ 1,872.36 to erect an annealing shop and proof house at the Musket Factory.[1] Col. George Bomford explained the need for this building as follows:

> "The present annealing shop and proof house are so constructed as to be exposed to much danger from fire; and their location in the immediate vicinity of the workshops, might, if fire were to originate in them, involve the whole of the workshops in flames. It is designed ....to increase their height and to make them fire proof. [2]

This stone building was started in 1834 and completed in 1835. The Annealing House or Furnace, Bldg. No. 15 on Map No. 8 (1848) was located on the bank of the Potomac River, in the northern line of shops, just west(above) of the upper Smiths Shop. The Annealing Shop and Proof House is probably Bldg. No. 6 on Map No. 4 (1834), p. 122.

Because of the co-mingling of construction funds and charging off costs to several accounts, the actual course of construction of the Annealing Shop and Proof House can only be suggested as follows: The probable mason who erected the stone walls may have been Joseph F. Thompson, who received $ $ 479.35 during the 4th quarter of 1834 for laying 271 perches of stone mortar wall in the walls of an unidentified building.[3] During the 3rd quarter of 1835 Thompson was paid $ 108.78 "for finding material and trowl dashing the proof house and annealing house, 444 square yards.[4] William Brown also received $ 19.99 during the third quarter of 1835 "for painting 155.3 square yards of two coats of painting done on Proof House and Annealing House."[5]

1. Estimate for 1834, Reel 20, Vol. 6, p.588. Appropriation in U.S. Statues at Large, IV,675- the money for this shop was included in t he sum of $ 36,114.86 voted for completion of the manhinery.
2. Estimate for 1834, Reel 20,Vol.6, p.588.
3. R.G. 217-1st Series, File 19257.
4. R.G. 217, 1st Series, File 20041, Abstract C.
5. R.G. 217, 1st Series, File 20041, Abstract D.

James Foley apparently did the carpenter work on the Annealing Shop and Proof House, receiving $ 143.84 for his services on December 24, 1834.[6]

d. Two shops for tempering springs and polishing barrels; Two houses for fire engines, and an Addition to the Stocking Shop.(Bldg. No. 5-1821 list):

The Ordnance Department requested and Congress appropriated in on May 14,1834 $ 1,821.45 " for erecting two shops for tempering springs and polishing barrels and erecting two engine houses" and making an "addition to the stocking shop(Bldg. No. 5 on Map 4(1834),p. 122.[7]

The Chief of Ordnance informed Congress in regards to the need for these four new structures and the addition:

> These shops are considered necessary in order to relieve the workmen in the shops where the tempering and polishing are performed, from the excessive heat, and dust, consequent on these operations.
>
> Heretofore, it has been necessary, for the want of an Engine house, to make use of one of the shops, for sheltering the Fire engines belonging to the armory. The shop now used for this purpose could be occupied advantageously in another way; and by the erection of two engine houses in more favorable situations, more speedy access might be had to the engines, in case of fire, and the security of the public property involved.
>
> The addition to the stocking shop is intended to supply the place of an old frame building, which is useless; and being composed of combustible materials, endangers the stocking shop immediately contiguous. By the erection of this addition, sufficient room will be acquired to permit a transfer of some stockers to it, who are now employed over one of the smith's Shops; the great heat from which, during the summer months, renders their situation unhealthy.[8]

6. R.G. 217, 1st Series, File 19257. On October 28,1834, Foley had also been paid $ 29.00 for making 29 door and window frames, but the structure is not specified.

7. Estimate for 1834, Reel 20, Vol. 6, p.588; Appropriation in U.S. Statues at Large,IV, 675. The money was included in the $ 36,114.86 listed for completion of machinery.

8. Estimates,1834, Reel 20,Vol. 6, p. 588-89.

The vouchers of the Armory Paymaster for the years 1834-35 do not contain enough specific information to state whether any of the four small shops and the addition were erected. These were probably all small buildings. The two fire engine houses should have been erected quickly and were probably of frame construction.

e. Guard Wall for the Musket Factory Shops:

Finally, in regards to the Musket Factory improvements, the Ordnance Dpartment requested and Congress appropriated on May 14, 1834 the sum of $ 900.00 " to erect a guard wall on the marign of the Potomac River to protect the public works".[1] Col. George Bomford explained the need for this wall to Congress as follows:

> After the canal for the public works shall have been completed the whole line of the public land contiguous to, and bounded by the Potomac river, will be protected by a stone wall, with the exception of a space of about 500 feet in length, extending from the termination of the canal to the outer walls of the Smith's Shops.
>
> By erecting the wall proposed by this project ... security would be afforded to the public buildings situated at the upper end of Potomac Street in the center of the Musket Factory yard, from the freshets in the Potomac river, and a considerable accession of land might be reclaimed from the margin of the river, which would serve for the sites of future buildings when they may became necessary...[2]

This 500 feet of wall was probably built, if at all, after 1835.

Congress did not appropriate any additional funds for repair and improvements at the Harper's Ferry Armory in 1835.

1. 1834 estimate, Reel 20, Vol. 6, pp.589-590. Appropriation in U.S. Statues at Large, Vol. Iv, p. 675. Funds for the river wall were included in the $ 8,589.87 sum voted for store houses, etc.
2. 1834 Estimate, Reel 20, Vol. 6, pp.589-90.

PHOTOGRAPH NO. 2

"View of Harper's Ferry, Va. (From the Potomac Side)", 1834-37.
Published by Currier & Ives, 152 Nassau Street, New York City.

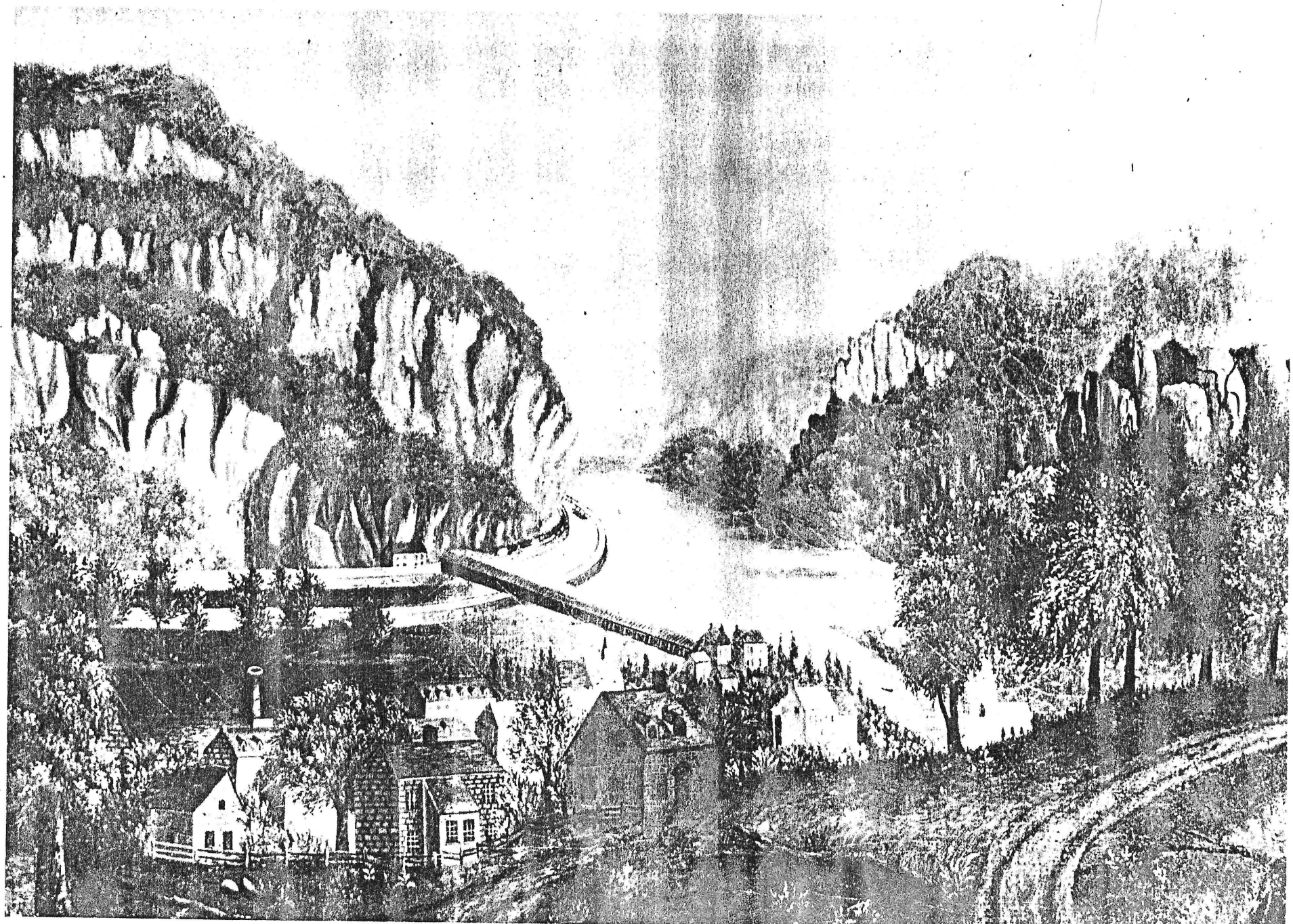
Harpers Ferry NHP Negative No. HF - 23

The fact that both the C. &. O. Canal and the B. &. O. Railroad are visible on the far side of the Potomac River indicates that this view was drawn after December 1834, when the railroad track arrived at a point opposite to Harper's Ferry. The wooden covered toll bridge across the Potomac River was owned by the Wager family of Harper's Ferry. The absence of a second bridge over the Potomac, built by the Winchester and Potomac Railroad Company, 1835- 1837, suggests that this picture was drawn prior to 1837.

This engraving gives a generally accurate impression of Harper's Ferry: some details are quite accurate (Note to the Catholic Church in right foreground, Park Buildings 1A and 1B on some closer structures, but less accurate on buildings in the distance. This drawing, however, is the most accurate of the view of Harper's Ferry that were published in the 1830's.

Near the south bank of the Potomac, near lower left hand corner are shown some of the Armory or U.S. Musket Factory workshops. The large and long shop with a huge stack is probably the Bldg. No. 2, "the Bell Shop, erected in 1809-10 and rebuilt with this large chimney following a fire in 1824.(1) Just to the right of the Bell Shop is the roof of Bldg. 1, Superintendent George Rust's Jr.'s quarters. Above his house can be seen a large two and one-half story brick Armory building, Probably Bldg. No. 11 on the 1834 Map. This may have been the new storehouse for iron that was built in 1834. This is the only known 1830 view of Bldgs. 2 and 11.

(1). Annual Report of Operations for Year ending June 30, 1848: "A large chimney stack of masonry in the Bell Shop, to accommodate a forge fire on each floor, has been taken down...." Serial No. 537, p.347.

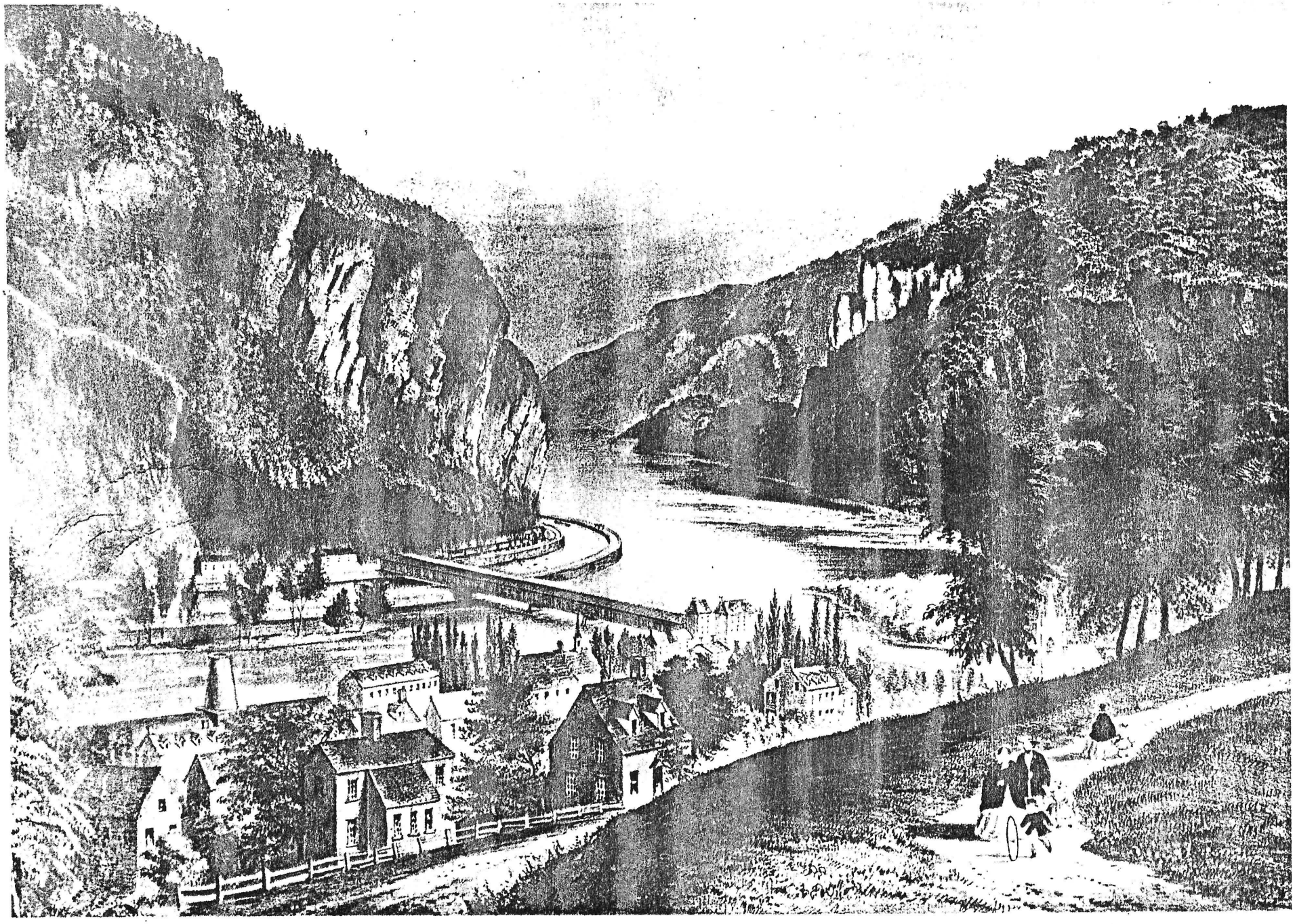


Unknown

Cc 1835.

WITH TRAIN? ? and Canal?

This 1826 painting was the basis for the 1857 Currier and Ives lithograph (opposite).



Currier and Ives, 1857.

HF - 23

Summary, Musket Factory Building Erected 1830-35:

Building	Year	Cost	Map Location
1. small building attached to finishing shop	1830	$ 152.00	Attached to Bldg. No. 2 on Map 4 (1834), p. 122.
2. small scrap iron house	1830	43.32	location unknown.
3. hardening furnace	1831	57.51	location unknown.
4. Stock House	1832-3	800.00	65 by 30 feet, Bldg No. 12 on Map No. 8 (1848)
5. Grinding Mill	1831	5,480.00	Stone, Bldg. No. 9 on Map No. 8(1848).
6. Forging Shop, Trip Hammer -"Barrel Welding and Tilt Hammer Shop"	1834-1835	13,500.00½	About 2/3 complete, Bldg. No 11 on Map. No. 8 (1848). Stone
7. Carpenters shop	1834-5	4,230.69	Stone, Bldg. 7 on Map. 8(1848)
8. Machine Shop	1834-5		Stone, Bldg. 8 on Map 8.
9. Storehouse for Iron, Steel, and Bin for Coal	1834	1,710.15	Brick, Bldg. No. 10 or 11 on Map No. 4(1834), p. 122.
10. Annealing Shop and Proof House	1834-5	1,872.36	Stone, Bldg. No.15 on Map No. 8(1848), Bldg. 6 on Map 4 (1834)
Ten structures erected	1830-5	$ 27,846.03	
Funded in 1834:			Evidence not clear that these
11. Shop for tempering springs		$ 1,821.45	shops were erected in 1834-35.
12. Shop for polishing barrels			
13. Fire engine house			
14 Fire engine house			
15. Addition to Stocking Shop.(Bldg. 5-Map 4(1834)			
Total: for 15 structures:		$ 29,667.48	

EXPENDITURES AT THE U.S. MUSKET FACTORY, 1830 - 1835 CHART 17

REPAIR AND IMPROVEMENTS (R.G. 217- Records of Armory Paymaster, R.G. 217

Year	Forging Shop Grinding Mill	Slating Roofs of workshops	Repairing Walls, 4 shops	New water wheels 3 shops	Completing Machinery, 3 shops	Erecting Storehouses	Other Funds	GRAND TOTAL
1830							2,354.02	2,354.02
1831	3,744.63						325.64	4,070.27
1832	710.86	380.48					(800.00) *	1,891.34
1833		2,632.94	849.95	6,294.90				9,777.79
1834	4,959.81			1,787.38	16,245.52	2,416.10 +		25,408.81
1835	8,540.19½				10,921.02	1,598.75		21,059.96
TOTAL	$ 17,955.49	3,013.42	849.95	8,082.28	27,166.54	4,014.85 +	3,479.66	$ 64,562.29
-	-	-	-	-	-	-	-	-
Appropriated	19,800.00	3,200.00	1,500.00	8,400.00	36,114.86	8,589.87	0	$ 77,604.73
Balance left	1,844.59	186.58	650.05	317.72	8,948.32	4,575.02	0	$ 16,522.28

* Estimated cost, $ 800.00, of erecting stock house in 1832-33.

+ $ 1,516.49 of this total of $ 4,014.85 was spent in 1834 grading and paving streets, leaving balance of $ 2,498.36 apparently spent at Musket Factory.

Total of approximately $ 63,045.80 spent at Musket Factory, 1830-35. for buildings, machinery, and water wheels.

U.S. Musket Factory Canal on the Potomac, 1830-35:

As has been noted in the last chapter, the Armory spent a total of approximately $ 5,013.09 in 1828-29 to widen that U.S. Potomac Canal that conveyed water to the Musket Factory by erecting 2,493½ perches of stone wall and 6,320½ cublic yards of embankments. In the estimates for 1830, the Ordnance Department requested and Congress appropriated on May 31,1830 $ 9,300.00 to continue the project "for extending the walls and embankments which convey the water from the Potomac river to the works."[1] The Estimates for 1831 requested and Congress appropriated on March 2,1831 the additional sum of $ 7,500.00 to complete this project, thus making a total of $ 16,800 provided for this construction.[2]

Two masons, John Garrett and John Gust, who had done considerable work on this project in 1828-29, did all of the construction in 1830-32. Between them, they erected a total of 10,805 perches of stone wall and made 23,050 cubic yards of embankment , receiving for their efforts in 1830-32 $ 14,961.27. With other costs of $ 558.30 included for lime, hydraulic cement, timber the total cost of the extending walls and embankment project came to $ 15,519.67 in 1830-32. (See Chart on Page 133 which is based on vouchers of Armory Paymaster that were issued for this construction.)[3]

3.National Armory Accounts and Annual Reports for 1830 and 1831,NA.R.G.156, Entry 936. HFNHP Reel 20,Vol. 5, p.421,437 give the following and differe account of brbkrass of construction from the Chart on page

Year	Perches Wall	Cost	Cub.Yrd Embank.	Cost	Other	Total
1830	2,440	$ 3,050.00	9,800	$ 2,450.00	$ 223.75	$ 5,723.75
1831	2,589	$ 3,248.87	4.350	$ 1,087.50	$ 288.25	$ 4,622.62
Total	5,029	$ 6,298.87	14,150	$ 3,537.50	$ 510.00	$10,346.37

1. 1830 estimates in Serial No. 195, Document No. 2, p.134. Appropriations in U.S. Statues at Large, IV, p.424.
2. 1831 estimates in Reel 20, Vol.6, p.550; Appropriation in U.S. Statues At Large,IV,p.467. In 1831 the Armory also spent $ 169.15 "for guard wall at Locks & sluice over the Canal.", National Armory Annual report for 1831, Reel 20, Vol. 5, p. 436. NARG 156, Entry 936.

CHART 18

EXTENDING CANAL WALLS AND EMBANKMENTS, 1830-32

Data from Record Group 217 (1)

Year	Masons	STONE WALLS Perches	Cost	EMBANKMENTS Cubic Yards	Cost	TOTAL COST
1830	Johnson Garrett	2,600	$ 3,250.00	9,000	$ 2,250.00	$ 5,500.00
1830	John Gust	2004	2,505.00	9,900	2,475.00	4,980.00
Total, 1830:		4,604	$ 5,755.00	18,900	$4,725.00	$10,480.00
1831	Johnson Garrett	5,130	2,425.00	3,150	775.00	3.200.00
1831:	John Gust	911	836.37	800	200.00	1,031.37
1831	Total	6,041	$ 3,261.37	3,950	$ 975.00	$ 4,231.37
1832	Johnson Garrett	160	225.00	200	25.00	$ 250.00
Total: 1830-32		10,805	$ 9,241.37	23,050	$5,725.00	$ 14,961.27
Total 1828-29		2,493½	-	6,320½	-	$ 4,088.85
GRAND TOTAL 1828-1832:		13,298½		29,370½		$ 19,050.22
Other Items, 1831 Wager Wall, 1828-29		-	-	-	-	391.50 510.00
1828-32 Total Cost of Project						$ 19,951.72

Expenditures, 1830-32 = $ 15,519.67

To Johnson Garrett, 1830-32	$ 8,950.00
To John Gust, 1830-31:	6,011.37
Other, 1830-32	558.30
Total, 1830-32	$15,519.67

1. R.G. 217-1st Series-1830 records File 14486-49A and 77A, 7A, 25B, 53A, 69A, 95A.
file 14723- 16A, 17A, 23A, 42A, 55A.
file 15209 for 4th quarter, 1830.
1831- 15260, 15603, 15936, 16904.
1832- file- 16657.

This chart is based on the Paymaster vouchers, which contain data on when the construction was performed by the two masons. The vouchers were actually paid off at the following annual amounts:

1830:	$ 9,043.00
1831:	$ 4,803.37
1832:	$ 1,673.30
Total:	$ 15,519.67
Balance left:	1,280.33

Total appropriated: $ 16,800.00.

CHART 19

National Archives Record Group 217 -
Records of the United States General Accounting Office,
Records of the Second Auditor of the
Treasury Department, 1817 to 1851
Washington, D.C.

Series No. 2nd

File No.	Voucher No.	Subject: Repairs and Improvements at the U.S. Armory at Harper's Ferry, Virginia				
		EXTENDING WALLS AND EMBANKMENTS OF THE POTOMAC CANAL				
		Paid to JOHNSON GARRETT: 1830				
		Date	Total	Perches of Stone Wall		Cubic yards of embankment
14486	49A	March 30,1830	$ 500.00	0		2,000 for $ 500.00
14723	16A	July 21,1830	2,500.00	1,200 for	$1,500.	4,000 for $ 1,000.00.
15209		Nov.9,1830	1,500.00	800	1,000	2,000 500.00
15209		Dec.22,1830	500.00	300	375	500 125.00
15209		Dec.31,1830	500.00	300	375	500 125.00
			$ 5,500.00	2,600	$ 3,250	9,000 $ 2,250.00
		PAID TO JOHN GUST, 1830				
14486	77a	March 31,1830	$400.00	200 for	$ 250.00	600 for $ 150.00
14486	7A	Apr. 15,1830	150.00	120	150.00	
14486	25B	Apr.20,1830	80.00	64	80.00	
14486	53A	May 15,1830	50.00	-	-	200 50.00
14486	69A	June 4,1830	200.00	100	125.00	300 75.00
14486	95A	June 22,1830	100.00	-	-	400 100.00
			$ 980.00	484	$ 605.00	1,500 $ 375.00
14723	17A	May 21,1830	$ 1,000.00	480 for	$ 600.00	1,600 for $ 400.00
14723	23A	July 29,1830	300.00	200	250.00	200 50.00
14723	42A	Aug.17,1830	400.00	220	275.00	500 125.00
14723	55A	Sept.18,1830	300.00	200	250.00	200 50.00
			$ 2,000.00	1,100	$ 1,375.00	2,500 $ 625.00
15209		Nov.8,1830	$ 300.00	200 for	$ 250.00	200 for $ 50.00
15209		Nov.19,1830	600.00	-	- -	2,400 600.00
15209		Nov.24,1830	400.00	120	150.00	1,000 250.00
15209		Dec.9, 1830	300.00	100	125.00	700 175.00
15209		Dec.24,1830	200.00	-	- -	800 200.00
15209		Dec.31,1830	200.00	-	- -	800 200.00
			$ 2,000.00	420	$ 525.00	5,900 $ 1,475.00
	Subtotal GUST:		$ 4,980.00	2,004	$ 2,505.00	9,900 $ 2,475.00
TOTAL GARRETT AND GUST: 1830			$ 10,480.00	4,604	$ 5,755.00	18,900 $ 4,725.00

National Archives Record Group 217 -
Records of the United States General Accounting Office,
Records of the Second Auditor of the
Treasury Department, 1817 to 1851
Washington, D.C.

Series No. 1st

File No.	Voucher No.	Subject: Repairs and Improvements at the U.S. Armory at Harper's Ferry, Virginia				
		EXTENDING WALLS AND EMBANKMENTS OF THE POTOMAC CANAL- 1831				
		Paid to JOHN GUST in 1831				
		Date	Total	Perches of stone wall		cubic yards of embankment
15260		Feb.17,1831	$ 300.00	200 for	$ 250.00	200 for $ 50.00
15603		May 24,1831	200.00	120	150.00	200 50.00
15936		Sept. 30,1831	200.00	80	100.00	400 100.00
16094		(4th qr.1831	336.37)	(511	336.37)	- -)
		GUST	$ 1,036.37	911	$ 836.37	800 $ 200.00
		PAID TO JOHNSON GARRETT in 1831:				
15620		March 11,1831	$ 500.00	250 for	$ 325.00	750 for $ 175.00
15603		June 23,1831	600.00	400	500.00	400 100.00
15603		May 18,1831	500.00	200	250.00	1,000 250.00
15936		3rd qr.1831	500.00	400	500.00	- -
16094		Nov.1831	400.00	320	400.00	- -
[illegible]		[illegible]				- -
16094		Dec. 1831	450.00	360	450.00	- -
16094		Dec. 1831	250.00	-	-	1,000 250.00
		GARRETT	$3,200.00	5,130	$ 2,425.00	3,150 $ 775.00
		To Johnson Garrett in 1832				
16657	2nd quarter 1832		$ 250.00	160 for	$225.00	200 25.00
TOTALs	1829	1829	$928.50	400	$ 475.00	2,267½ $ 453.50
	1830	1830	$10,480.00	4,604	$ 5,755.00	18,900 $ 4,725.00
	1831	1831	$ 4,236.37	6,041	$ 3,61.37	3,950 $ 975.00
TOTAL, 1829-1831:		1829-31	$15,644.87	11,045	$ 9,491.37	25,117½ $ 6,153.50
1832:	1832		250.00	160	225.00	200 25.00
	GRAND TOTAL 1829-32		$15,948.87	11,205	$ 9,716.37	25,317½ $ 6,178.50

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements.

EXTENDING WALL AND EMBANKMENTS 1830- 1835.
OF THE POTOMAC CANAL

16,800.00 appropriated

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a 0	b 0	c 4,500.00	d 4,543.00	9,043.00	257.00
1831	e 1,080.75	f 1,312.00	g 700.00	h 1,710.62	4,803.37	3,455.63
1832	i 0	j 250.00	k 1,301.57	l 121.73	1,673.30	* 1,280.33
1833	m 0	n 0	o 0	p 0	0	0
1834	q	r	s	t	0	0
1835	u	v	w	x	0	0
TOTAL					15,519.67	0

* The balance of $ 1,280.33 left on December 31,1832 was transferred in 1833 to the project

9,300.00 in 1830.

7,500.00 in 1831.

a.14486
b.14723
c.14819
d.15209

e. 15260
f. 15603
g. 15936
h. 16094

i. 16388
J. 16657
k.
m. 17153
M. 17163

The balance of $ 1,280.33 left unexpended from the appropriation of $ 16,800.00, was transferred, as we shall see, on July 12,1832 for use in making repairs to the U.S. Potomac Dam, which had been damaged in a flood.

In the estimates for 1833 Chief of Ordnance Bomford requested and received from Congress the sum of $ 13,495.00 for the "enlargement of the canal supplying the water-power from the Potomac Dam to" the Musket Factory.[4] Col. Bomford explained the need for this project to Congress as follows:

> The present present canal has never been sufficiently wide to admit an abundant supply of water for the works, and the necessity of its being enlarged, or another made, is indispensable should the (proposed) dam... be erected by the Potomac (C. &. O.) Company (just below the existing U.S. Armory dam).... (5)

On March 17, 1833, the Chief of Ordnance directed Superintendent George Rust, Jr. to proceed with the canal enlargement project.[6] On August 3,1833, Rust entered into a contract with Johnson Garrett:" to construct and finish in a substantial and workmanlike manner, the Canal leading from the public dam to the works at Harper's Ferry Armory comprehending a distance of about 1,980 feet from the termination of the present Canal at the cross wall., to a point opposite the corner of the stone house occupied by Michael Crowl. " The earth and stone (were) to be procured from the land of the United States and of such qualtity as an engineer appointed as above shall approve."[7]

"The specification for the Construction of the Canal From the Cross Wall to Crowel's House", states that "The walls and

4. Estimates, Reel 20, Vol. 6, p.571, from National Archives R.G. 156, Entry 129, Vol. I, p. 105; Appropriation, approved March 3, 1833, from U.S. Statees at Large, IV, p. 642.
5. Reel 20, Vol. 6, p. 577.
6. Reel 14, Vol. 9,.p.889.
7. Record Group 156, Contract Book No. 13, pp.192-195. in HFNHP Photostat Collection, Vol. 1, pp.19-12.

embankments to extend from the cross wall at the termination of the new Canal to a point opposite to Crowl's house. comprehending a distance of about 1,980 feet, and connecting with the present bank of the old Canal at about 420 feet from the cross wall before mentioned. The height of the embankment to be equal to that of the new canal with a width at the top (including the inner slope or paving) of 12 feet, and a batter of one to one to both inner and outer slopes. The wall on the outside to be three feet at base and two at the top with a batter as before mentioned of one to one and equal to 12 feet in particular height to be made of good stone and laid in a workmanlike manner, the inner slope to be lined with a wall or paving at least one foot thick extending from the bottom to the top of the embankment, and to be at least equal to the paving in the Canal already completed. A foundation for the outerwall and inner pavement shall be prepared under the instruction of an engineer appointed by the Superintendent.

The whole of the space between the outer wall and the inner paving to be filled with coarse filling except eight feet in the centre which shall be firmly and compactly puddled with good earth approved of by the engineer and made perfectly impervious to water, the said puddling to be continued of same width and to be made of similar materials to the top of the embankment.

The top of the existing embankment of the old canal from the point of intersection of the new or completed canal, was to be removed to the de of at least three feet below the ordinary surface of the water in the existing canal, and this removed earth was to be reused in making the embankment of the new canal.

The contractor was to be paid at the rate of $ 1.25 per perch of 25 cubic feet for the dry masonry of the outer wall. For the embankment, which included the paving or walling of the inner slope and also the puddling in the center, the contractor was to received 25 cents per cubic yard."[8] (See Appendxes No. 4 and 5 for 1833 Contract and Specifications for building the Canal).

8. National Archives R.G. 156, Contract Book No. 13, pp. 192-195; HFMHP Photostat Collection, Vol. 1,pp.22-23.

The engineer for the Armory, if any was used on the canal enlargement project, was Alfred Cruger, who was employed primarily for work on the U.S. Potomac Dam in 1833.[9]

In the special estimate for 1834, Col. George Bomford requested an additional $ 2,149.89, explaining:

> It has been thought advisable to vary the location of the canal ....from that contemplated, when the former estimate was made. This change has been made at the suggestion of _____ the principal Engineer of the Chesapeake and Ohio Canal: it will serve additional advantages connected with the water power, and will cause the additional expense as stated. As all the tilt hammers for welding barrels will be driven by the water to be obtained from this canal, it will be indispensably necessary to have it completed, before any of the tilt hammers can be put in operation.[10]

The requested sum was appropriated by Congress on May 14,1834.[11]

Supt. Rust then discovered that there had been an error in the calcuations and that another $ 3,378,27, in addition to the $ 2,149.89, would be needed to complete the project before the tilt hammers could operate.[12] The additional sum of $ 5,528.16, provided in 1834, added to the originial appropriation brought the grand total available to $ 19,023.16

The requested $ 3,378.27 was appropriated by Congress on June 19,1834.[13]

The vouchers of the Armory Paymaster reveal that contractor Johnson Garrett got underway on the project in the 3rd quarter of 1833 and had completed this work during the 3rd quarter of 1834 at a total cost of $ 17,616.38. Other costs brought the total to $ 18,449.83.

9. R.E. 217- File 17895,1st series, Voucher dated Nov. 23,1833 to Alfred Cruger for $ 300.00.

10. Reel 20, Vol. 6, p. 588.
11. U.S. Statues at Large,,IV, p.675.
12. Reel 22, Vol. 15, pp.1514-1515, 1520' Reel 20, V. 6, p.583.
13. U.S. Statues at Large, IV, 680.

CHART NO. 21

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

ENLARGEMENT OF THE POTOMAC CANAL 1830- 1835. Appropriated $ 19,023.16

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a	b	c	d		
1831	e	f	g	h		
1832	i	j	k	l		
1833	m 128.85	n 0	o 1,875.00	p 5,829.23	7,833.08	8,125.00
1834	q 3,105.00	r 6,011.75	s 1,500.00	t 0	10,616.75	1,853.66
1835	u	v	w	x		
TOTAL					18,449.83	

Appropriated $ 13,495.00 in 1833; appropriated $ 5,528.16 in 1834.

m.
n.17163
0. 17895
p. 17895

q.
r. 18712
s. 19021
t. 19257.

A balance of $ 1,853.66 was left unexpended in this appropration on December 31,1834.[14]

The Paymaster's voucher reveal that John Garrett performed the following work under his contract:

Year	Stone Walls Perches	Cost	Earth Embankments Cubic Yrds.	Cost	Other	Total
1833	460	$ 575.00	27,880	$ 6,970.00	$ 288.08	$ 7,833.08 (15)
1st qt 1834	?		/?-	-?	-	3,105.00 (16)
2nd qr 1834	2,200	$ 3,300.00	10,400	$ 2,700.00	11.75	6,011.75 (17)
3rd qr 1834	?		?	?		1,500.00(18)
Subtot 1834						10,616.75
TOTAL 1833-34	2,660+	$ 3,875.00+	38,280+	$ 9,670.00+	$ 299.83+	$ 18,449.83

During the years 1830 to 1834 a total of $ 33,969.50 was spent building walls and embankments and for widening the Musket Factory Canal; from 1828 to 1835 a grand total of $ 38,985.29 was expended rebuilding the Potomac Canal. By October 1, 1834, the U.S. Musket Factory Canal had obtained the width, depth, and location that it was to retain until the Armory was destroyed in 1861.

Potomac Canal, Widening,Walls and Embankments,1828-34

Years	Stone Walls Perches	Earth embankments Cubic yards.	Total Cost
1828-1829	2,493½+	6,320½	$ 5,013.09 *
1830-1832	10,805	23,050	$ 15,519.67 **
1833-1834	2,660+	38,280+	$ 18,449.83
Total	15,858½+	67,650+	$ 38,982.59

*perches of stone in Wager Line wall not included. The cost of $391.50,however,is.
** In 1831-32 and additional $ 1,955.59 spent from the Tilt Hammer shop fund was spent building walls along the canal. This shop was shifted from its 1831 site to its finallocation in 1834 . With that amount included, a total of $ 39,561.99 was spent on canal walls and embankments from 1828 to 1835.

14. R.G. 217-File 19257.
15. R.G. 217- File 17895-Voucher 1A. and
R.G. 217-file 17895-abstract 4th quarter 1833,Enlarging of Canal.
16. R.G. 217 file 19257-Summary of work on canal, 28 April,1835 prpared by Fleming Hixon, Clk, Supt.s Office, for period 1830-1834.
17. R.G. 217-File 18712- Abstract 3nd quarter 1834, enlargement of canal.
18. R.G. 217-file 19257-Summary of work on canal, 1830-34, by Hixon. Vouchers detailing work on canal in 1st and 3rd quarters of 1834 not found.

ILLUSTRATION NO. 3

Report of

Clerk Fleming Hixon, Superintendent's Office,

Harper's Ferry Armory, Virginia, 28th April 1835

Regarding

the Construction of Walls and Embankment and

Widening of the U.S. Musket Factory Canal,

1830 - 1834.

National Archives, Washington, D.C.

Record Group 217, General Accounting Office Records,
Records of the Second Auditor of the Treasury Department,
First Series, File No. 19257.

Upon a careful and diligent examination of the Books and Correspondence in this office, I find the subjoined statement, exhibits the situation of the several Special Appropriations for the Armory Canal. The subjoined results found by closing the Accounts on the conclusion of the 3rd Quarter of 1830. (Return of Lt. Colo. Maj. B. J. and right Lt. dated 30th Sept. 1834 ——

The Appropriation for "Walls and Embankments" in 1830 was		$300 —
There was expended of this sum, prior to the 30th Sept. 1830 this sum	4500 —	
There was refunded when Dock Bridge was appropriated Paymaster	4800 —	$300 —
During the 4th Quarter of 1830, there was expended this sum	4543 —	
" " 1st Qrt of 1831, there was expended this sum	1080 75	
" " 2nd Qrt of 1831, there was expended this sum	1312 —	
" " 3rd Qrt of 1831, there was expended this sum	700 —	
" " 4th Qrt of 1831, there was expended this sum	1710 62	
	$9346 37	
On the 12 Nov. 1831, there was remitted for "Walls & Embankments"	$7500	
" " 16 " 1831, there was remitted for "Walls & Embankments"	500 8000 —	
Leaving due the Paymaster on the 31 Dec. 1831 on this Appropriation this sum		$1346 37
During the 2nd Quarter of 1832 there was expended this sum	250 —	
" " 3rd Qrt of 1832, there was expended this sum	1301 57	
" " 4th Qrt of 1832 there was expended this sum	121 73	
	$3019 67	
On the 25th April 1832, there was remitted for "Walls & Embankments"		4310 —
Deduct the above am't of		3019 67
Leaving on the 31 December 1832 in the Paymaster's hands of this "Appropriation		$1290 33
On the December 1833. There was remitted for the "Enlargement of Canal" this sum		10.000 —
On the 31st March 1834, there was remitted for the Enlargement of Canal this sum		3.495 —
On the 30th November 1834 there was remitted for "Completing Canal from the Potomac Dam to Tide Water"		3.378 27
For the Appropriation for Completing Machinery of 36.114 29 this sum is allowed for the completion of the Canal		2149 89
		$20303 49
During the 1st Quarter of 1833. there was expended for "Enlargement of Canal"		128 85
" " 2nd Qrt of 1833 there was expended for " Ditto "		000 00
" " 3rd Qrt of 1833. there was expended for " Ditto "		1875 00
" " 4th Qrt of 1833. there was expended for " Ditto "		5.829 23
Total expended in 1833		$7.833 08
During the 1st Quarter of 1834. there was expended for "Enlargement of Canal"		3.105 "
" " 2nd Quarter of 1834. there was expended for " Do "		6.011 75
" " 3rd Quarter of 1834 there was expended for " Do "		1500 "
Total expended in 1833. 4 3rd Qr of 1834	$18.449 83	18449 83
Leaving this amount in the Paymaster hands unexpended, on 30 Sept. 1834		$1.853 66

B. [illegible] 1833 [illegible] $75.08 [illegible] this date [illegible] of $1.853.58.

28th April 1835.

Fleming Dixon Clk Sub. Office.

RECORD GROUP 217- 2nd Auditors Accounts,
Ist Series, File No. 19257.

Chart No. 22

National Archives Record Group No. 217- Records of the United States General Accounting Office, Washington, D.C. Records of Second Auditor: and Accounts from the Paymaster of the U.S. Armory at Harper's Ferry, Virginia, relating to expenditures for Permanent Improvements;

1830 - 1835

YEAR	Extending Walls & Embankments Canal	Widening Potomac Canal	Repair & Extension Potomac Dam	GRAND TOTAL Potomac	Purchase water rights Shenandoah	Repair & Extend Shenandoah Dam	
1830	9,043.00	-	-	$ 9,043.00	-	-	
1831	4,803.37	-	-	4,803.37	-	-	
1832	1,673.30	-	-	1,673.30	-	-	
1833	-	7,833.08	3,374.94	11,208.02	$ 2,600.00	-	
1834	-	10,616.75	489.04	11,105.79	-	1,999.50	
1835	-	0	342.75	342.75	-	-	
TOTAL:	15,519.67	18,449.83	4,206.73	$ 37,219.23	2,600.00	1,999.50	
BALANCE LEFT:	* 1,280.33	1,853.60	793.66		+ 2,000.00	+ .50	
APPROP-RIATION	16,800.00	19,023.16	5,000.00	40,823.16	4,600.00	2,000.00	

* Balance transferred for use in repairing Potmac Dan in 1832..

+Money reverted to U.S. Treasury.

U.S. Armory Dam on the Potomac.1830-35:

On July 10,1832, Superintendent George Rust,Jr. informed Col. Bomford, "The freshets of the last winter & spring removed a considerable portion of the dam across the Potomac river, which supplies the public works with water, and which must be repaired in order to prevent the usual operations of the Armory being suspended from the want of water," He reported that there were still funds available in the appropriations for work on the Potomac Canal and requested permission to use these funds to repair the dam.[1] Bomford authorized Rust to use whatever remained of the balance of the appropriation for the Canal to fix the dam on July 12.[2]

The balance of $ 1,280.33 left in the special appropriation of the completed project for extending the walls and embankment of the Musket Factory Canal , was thus apparently used up in 1832 to repair the Potomac Dam.

The newly formed Chesapeake and Ohio Canal Company, which had absorbed the old Potomac Canal Company in 1828, was now nearing Harpers Ferry in the construction of a canal along the north or Maryland bank of the Potomac River. On July 7, 1832, Col. George Bomford sent Superintendent George Rust, Jr. a copy of a Canal Company report and plan for a proposed dam that they intended to build near the Armory and requested Rust to comment on the effect that dam might have on armory operations.

1. HFNHP Microfilm reel No. 22, Vol. 13, p.1243.
2. Reel 14, Vol. 9, p. 863.
3. For balance in fund, see R.G. 217-File 17153.

Rust, who probably knew little about water power, had Captain John H. Hall of the Patent Rifle Factory prepare the response. Hall strongly opposed the construction of the proposed canal company dam on the Potomac because, he concluded, it would severely handicap operations at the U.S. Musket Factory on the Potomac. He pointed out to the Chief of Ordnance that the top of the proposed canal dam would be only two and one-half feet below the level of the water wheel in the new (1831) grinding mill at the Musket Factory. Thus every time the water in the Potomac rose two feet, the "lower" (new) mill would be put out of operation and a rise of more than two feet would also render the "upper" grinding mill (presumably at the Rifle Factory on the Shenandoah) inactive.[4]

The C.& O. Canal Company apparently proceeded with their plan for a dam at Harper's Ferry and in 1833 the U.S. Potomac Dam was repaired and extended for a fifth time since 1798.

In 1833 Col. George Bomford requested and Congress appropriated on March 2 $ 5,000.00 "for repairs and extension of the public dam on the Potomac River from which the supply of water is obtained " for the musket Factory.[5] The Chief of Ordnance explained the need for this work as follows:[6]

> The public dam here alluded to, has received serious injuries from the floods in the Potomac, which during the last year have been greater and more distructive than usual. It is also ascertained that the Potomac Company (sic) have determined to erect a dam across the Potomac river immediately below the public works, by which dam the present available water-power at the armory will be very much diminished, from the effects of the backwater; and for this reason the water wheels, which it has been intended to substitute in lieu of those now in use at the works, cannot be sunk as low as was expected, and will consequently require a large body of water to drive them. For these reasons, the dam will be required to be higher, more extended, and more perfect in all respects than it has hitherto been.

4. Reel 14, Vol. 9, p. 862, Bomford to Rust, July 7,1832; Reel 22, Vol. 12, pp. 1201-1204, Hall to Bomford.

5/.Estimate, 1833- Reel 20, Vol. 6, p. 576 or National Archives R.G. 156, Entry 129, Vol.1, p.110. Appropriation, approved March 2,1833, in U.S. Statues at Large, IV, p.642.

6.Estimate,1833,Reel 20, Vol. 6,p.576.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

REPAIR AND EXTENSION OF POTOMAC DAM 1830- 1835. $ 5,000 appropriated in 1833.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1830	a	b	c	d		
1831	e	f	g	h		
1832	i	j	k	l		
1833	m 0	n 0	o 3,374.55	p ----------	3,374.55	1,625.45
1834	q 0	r 0	s 338.04	t 151.00	489.04	1,136.41
1835	u 0	v 0	w 0	x 342.75	342.75	793.66
TOTAL					4,206.34	793.66

o. 17895
p. 17895
q.
r. 18712

s. 19021
t. 19257
u. 19514
v.

w. 20041
x. 20281.

The engineer who furnished the plan and superintended the construction of the U.S. Potomac Dam in 1833 was Alfred Cruger, who received $ 300.00 for his services.[7]

The contractor for rebuilding and repairing the Potomac Dam was Lewis Wernwag of Virginius Island, who had rebuilt the Potomac Dam in 1828-29, and who was also, in 1834, to rebuild the U.S. Dam on the Shenandoah. Wernwag began construction probably in August and had completed the task by November 8,1833, receiving a total of $ 3,174.55 for his services. In this fifth rebuilding, Wernwag accomplished the following work on the dam:

For 41 perch dry masonry	$61.50
For 93 perch mortar masonry secured by bolts and champs.....	418.50
For 265 cubic Yds embankment	99.37
33 7/100 running rods of dam.....	2,468.60
Filling at upper side on Maryland shore.....	40.00
Filling at upper side on Virginia shore.....	30.00
For 3 perches stone paving or filling.....	1.50
For 17 1/3 perches,mortar wall at Lock.....	113.33
For 7 perches dry wall at Lock ...	8.75
Total 1833 bill:	$ 3,174.55 (8)

With the engineer's wages included, the total cost of repairing and extending the U.S. Potomac Dam in 1833 came to $ 3,474.55.

In 1834 a total of $ 489.04 was spent on repairing the Potomac Dam.[9] Of this total, $ 151.00 was paid to the mason Johnson Garrett for labor, 151 days of work, "employed in mending a breach in the canal and waste way.[10] The balance of $ 338.04 may have been spent on materials.

7. R.G. 217- File 17895, V. dated Nov.23,1833.
8. R.G. 217- File 17895-Voucher 2A. Wernwag was paid $ 1,229.00 for making 13 perches of dam on Sept. 14,1833; $ 510.00 for making 6 perches of dam on Oct.13, and the balance $ 1,435.35 on November 8,1833.
9. R.G. 217- File 19021, 19257.
10. R.G. 217- File 19257- Abstract F. Dated May 31,1834, this bill was not paid until the 4th quarter of 1834.

ILLUSTRATION NO. 4

Copy of a Portion of Harper's Ferry Armory Paymaster's Voucher No. 31 to Lewis Wernwag "for the Repair and Extension of the Public Dam on the Potomac River," November 1833.

Balance of $ 1,435.35 due to Wernwag was paid to him on November 8, 1833.

National Archives, Washington, D.C.

Record Group 217, Records of the Second Auditor, First Series, File No. 17895, Voucher No. 2A.

RECORD GROUP 217-Records of 2nd Auditor
File No. 1st Series 17895
Voucher No. 2A

No. 37

THE UNITED STATES, (Harper's Ferry Armory,)

To Lewis Wernwag Dr.

						REMARKS.
1833						
November	8	For 41 perch dry masonry	@ 1.50	✓	61.50	"For Repair & Extension
		" 93 " Mortar do secured by bolts & Clamps	4.50	✓	418.50	of the Public dam on
		" 265 Cubic Yds. embankment	37½	✓	99.37	the Potomac river"
		" 5 75/100 running yards of dam	116	✓	667.00	
		" 5 45/100 " " partly made (or finished)	25.-	✓	136.25	
		" 17 03/100 " " entire	85.-	✓	1447.55	
		" 4 84/100 " " sup.d or filled with stone	45.	✓	217.80	
		" Filling at upper side on Maryland shore			40.00	
		" do do Virginia "			30.00	
		" 3 perches stone paving or filling	1.50	✓	4.50	
		" 17⅓ " Mortal walls of Locks,	2.50	✓	43.33	
		" 7 " dry " "	1.25	✓	8.75	
				✓	3174.55	
		deduct				
		Amount paid in part 14th Sept 1833.		✓	1229.00	paid Stevens Denton acco't
		" " 15 Oct "		✓	510.00	1739.00 1435 55

During the 4th quarter of 1835, $342.75 was spent on repairs for the Potomac Dam.[11] During the years 1833 to 1835, a total of $ 4,206.34 was expended of the $ 5,000.00 appropriated for repair and extension of the Potomac Dam. A balance of $ 793.66 of these funds was carried forward on the Armory books on December 31,1835 and this was not used up until 1838.[12]

With the 1832 repairs included, the amount of which is not known, the maximium expenditures on the Potomac Dam from 1830 to 1835 did not exceed $ 5,586.67.

11. R.G. 217- File 20281.
12. R.G. 217- 2nd Series-File 2729.

SUMMARY OF EXPENDITURES FOR REPAIR AND IMPROVEMENTS FOR U.S. MUSKET FACTORY BUILDINGS, CANAL, AND DAM, 1830 to 1835:

YEAR	BUILDINGS	CANAL	DAM	GRAND TOTAL
1830	2,354.02	9,043.00		$ 11,397.02
1831	4,070.27	4,803.37		8,873.64
1832	1,891.34	1,673.30		3,564.64
1833	9,777.79	7,833.08	3,374.94	20,985.81
1834*	23,892.32	10,616.75	489.04	34,998.11
1835	21,059.96		342.75	21,402.71
TOTAL	63,045.70	33,969.50	4,206.73	$ 101,221.93
Approp.	$ 77,604.73	35,823.16	5,000.00	$ 118,427.89
Balance Left	16,522.28	1,853.66	793.66	19,169.60

* The sum of $ 1,516.49 has been deducted from the building total for 1834. This amount was spent for grading and paving streets and sidewalks.

CHAPTER VIII

THE U.S. MUSKET FACTORY, 1836 - 1841.

THE END OF AN ERA

During the years 1836 to December 31, 1841, Congress appropriated a grand total of $ 248,209.00 in special appropriations earmarked for making repairs and improvements to Harper's Ferry Armory buildings, canal, and dams, for making new machinery, and for the purchase of additional land. (See Chart No. 25, p.153 for 1836-41 appropriations for permanent improvements). In addition about $ 20,283.11 in special appropriations for improvements, made 1830-35, were carried forward, so that the grand total of construction and land money available for use during the years 1836 to 1841 was $ 268,492.11. During the years 1836 to 1841 the Harper's Ferry expended a total of $ 287,919.69 for permanent improvements, including new machinery.(See Chart No. 24, p. 152).

Grand total of expenditures for land, permanent improvements and machinery at the Harper's Ferry Armory from 1796 to 1841 appears to have been about $ 894,544.11, including machinery.

Despite the heavy expenditures of money for permanent improvements at Harper's Ferry, the physical plant of the Armory was aged and in poor condition. In the"Special Special Estimate for Additional Appropriations for the service of the Ordnance Department for the Year 1839, dated November 16, 1838, Col. George Bomford bluntly informed Congress:

"The strongest necessity exists for the improvement of the public buildings at Harper's Ferry Armory - they are at present exceedingly unslightly and unworthy of a National Establishment, and many of them, being mere wooden sheds, are besides liable to accident from fire..." [1]

1.National Archives Record Group 156, Entry 129, Vol. II, p.6; Harpers Ferry NHP Microfilm Reel 20, Vol. 6, p. 624.

	Approp. for Construction	Armory Expenditures for Land	Construction and Repair	No. of Arms made	No. of workmen	Source Ser.	Doc.
1836	$ 77,897.00	0	$ 28,678.42	10,959	243	304-	186
1837	62,312.00	0	+ 81,679.27+	10,417	262	331-	428
1838	20,000.00	0	55,541.11	14,934	294	349-	237
1839	0	0	10,925.72	5,850	272	365-	100
1840	50,000.00	0	18,089.78	10,330	241	378-	175
1841	38,000.00	0	74,002.87	8,840	267	403-	157
1836 1841	$ 248,209.00	0	**$ 268,917.17**	61,330	-		-
1796 1841	$389,687.00	$ 45,477.28	$ 830,393.31	372,145	-		-

Total Expenditures, 1796-1841,
for land, construction and repairs: $ $ 875,541.59

For new Machinery(not included in the Construction and Repair figures above)

1839:	$ 15,826.77	(A)	plus $ 10,925.72=	26,752.49
1840	$ 3,175.75	(B)	plus 18,089.78	21,265.53
Total	19,002.52			$ 48,018.02

$ 287,919.69 with machinery included.

+ The chart for 1837 operations, as published by the War Department, lists only $ 13,642.18 under expenditures for permanent improvements, but in the accompanying text is listed an expenditure of an additional $ 68,037.09 from the special appropriations, which had to be for permanent improvements.

A. Serial No. 365. Document No. 100, p.2.
B. serial No. 378, Document No. 175, P. 5.

Chart no. 25

Appropriations for Permanent Improvements at the National Armory at Harper's Ferry, Virginia, 1836-41

Projects	1836	1837	1838	1839	1840	1841	Total
New Machinery	23,725	-	20,000	-	-	+	43,725 +
Repairs on Potomac Canal	5.260	6,459					11,719
Storehouse for condemned parts	3,400						3,400
Store house for coal	650						650
erecting 10 new dwelling houses	12,000						12,000
For purchase one acre Wager land	5,000			(1)			5,000
Purchase of private bldgs on public land	16,290			(2)			16,290
for claims for repairs to dwelling houses	4,548						4,548
Forge for scrap iron	5,000						5,000
Sinking well and pump, grinding mil	1,000						1,000
Completion of 1834 tilt hammer shop		6,656					6,656
New river wall, Musket factory		40,628					40,628
Repair & improvements, Armory	-				35,400*	38,000+	73,400
Shops at Rifle Factory	1,024	8,569			14,600		24,193
Total	77,897	62,312	20,000	0	50,000	38,000	248,209

(1) $ 5,000 reverted to general Treasury. (2) $ 1,595 reverted to General Treasury

* included funds in 1840 for new forge and new grinding mill.
\+ includes funds in 1841 for new machinery.

Not only were most of the large brick workshops at the U.S. Musket Factory more than 30 years old by 1841, but the new Potomac Canal, widened and deepened during the years 1828 to 1835 at a cost of $ 38,439.85, required extensive repairs during 1837-38 that cost $ 11,623.18 in additional work to keep the canal embankment from completely failing.

One noteable improvement was made at the Musket Factory during the years 1836-41, the original size of yard or grounds were considerably expanded by building a great stone river wall foreward(northward) some 50 feet into the Potomac River and then the area behind the wall was filled in with earth and gravel to create new land. The river wall was 1,624 feet long, about 15 feet high, and ranged in thickness from nine feet at the base to three feet at the top. Cost of construction was about $ 40,628. The large stone tilt hammer shop for barrel welding, started in 1834, was finally completed in 1837 at an approximate cost of $ 22,750.44.

In 1838 the United States Government granted the Baltimore and Ohio Railroad Company a right of way up (west) along the front(north) of the new Potomac River Wall. In 1840-42, the company constructed a similar stone river wall into the river that paralleled the new Armory wall. The two walls stood as the foundations for the trestles that carried the main line of the B. &. O. R.R. westward. The completion of the railroad river wall in 1842 increased the width of the Musket Factory yard to its present width.

Construction and Repair at the U.S. Musket Factory, 1836- 1839:

Congress's last appropriation for permanent improvements at the National Armory at Harper's Ferry, Virginia, amounting to $ 50,083.00 had been made on June 19,1834. By January 1, 1836, only about $ 19,169.00 of these funds had not been expended. On July 2, 1836, in response to Chief of Ordnance George Bomford's request, Congress voted the sum of $ 77,897.00 in special appropriations to make further permanent improvements at the Harper's Ferry Armory.[1] On March 1, 1837, Congress provided additional funds in the amount of $ 62,312.00 for improvements,[2] $ 20,000.00 on July 7, 1838,[3] and nothing in 1839. (See Chart 25, p. 153).

Of the total of $ 160,209 thus provided, $ 117,778 was earmarked for permanent improvement projects at the U.S. Musket Factory as follows:

1. Construction of river wall.....	$ 40,628
2. Purchase of acre of land.....	5,000
3. Digging a well.....	1,000
4. Making new machinery.....	43,725
5. Constructing or completing four buildings.....	15,706
Subtotal, Musket Factory proper:	$ 106,059
6. Repair of Musket Factory Canal....	11,719
Total New Funds, 1826- 1839.....	$ 117,778 for Musket Factory.
Total Old Funds carried forward	19,169 for Musket Factory
Grand total available, 1836-39	$ 136,947 for Musket Factory.

1. 1836 Estimates in Serial No. 288, Document No. 90, pp. 7-10; Appropriations in U.S. Statues at Large, Vol. V, p.77.

2. 1837 Estimates in Serial No. 303, Document No. 107, pp.2-4, Appropriations in U.S. Statues at Large, Vol. V, p.149.

3. Appropriation in U.S. Statues at Large, Vol. V, p.267; Congress declined providing $ 16,139 in additional funds requested by the Ordnance Department in the Special Estimates for 1838, National Archives R.G. 156, Entry 129, Vol. 1, pp. 211, 214.

1836 Construction Season:

Of the total of $ 77,897 appropriated by Congress for 1836, $ 44,035.00 was in seven projects for making permanent improvements at the Musket Factory,

Because the act was not approved until July 2,1836, the building season for that year was nearly half gone when the money became available. Lt. Col. George Talcott, Ordnance Department Inspector of Armories and Arsenals, rushed up to Harper's Ferry in an effort to expedite the building program that was based on 1836 funds. Talcott, writing from Harper's Ferry on July 9,1836, informed Col. Bomford:

> The principal object (of his second inspection of the Armory in 1836) was to make provision for the construction of various buildings required at that place and for which the necessary funds have been appropriated by Congress (on July 2,1836). The lateness of the (construction) season renders it very difficult to provide materials in time to complete the small buildings this year and the large ones cannot be commenced till the spring of 1837. Taking into view the course pursued for years past and the results, at that place, I would urge in the strongest manner, the employment of some person as a kind of Master Builder, to supervise the erection of all buildings authorized to be constructed. He should be a good mechanic and able to direct the operations of others. Three dollars per day would be a fair price for such services and I have no doubt a suitable man can be found for such wages...." [4]

Talcott's suggestion for engaging a master builder to supervise and plan construction at the Harper's Ferry Armory was not adopted during the 1836-41 period.[5]

4. HFNHP Photostat Collection, Vol. 1, p.48-National Archives R.G. 156.

5. By Dec.31,1841, the Armory had a "Master Carpenter" James Bateman on its payroll, together with 14 other carpenters, but Bateman does not appaear to have served the function of a "master builder."

On August 7,1836, Lt. Col. Talcott also wrote to Superintendent George Rust, Jr. to urge and encourage Rust to make all the preparations possible in 1836 so that the construction program could be carried out on a large scale in 1837. Talcott remarked:

"... I would therefore urge you to make all the purchases (of building materials) in your power at once, and put up the Coal House, the Forge (at the Musket Factory), the Drill Shop at the Rifle Works, repair the (Potomac) Canal and sink the well (at the Grinding Mill at the Musket Factory), ... also make contracts for the (erection of 10) dwelling houses if practicable and also the Store-house for scraps and condemend parts (at the Musket Factory, which were all to be built from the 1836 appropriations)... [6]

But whatever hopes Talcott may have had for launching a major construction program in the spring of 1837 were dashed when Superintendent George Rust Jr. resigned his position as superintendent of the Armory in March 1837. President-elect Martin Van Buren selected his friend and political ally, Edward Lucas, Jr. of Shepherdstown, Jefferson County, Virginia, to be the new superintendent of the Harper's Ferry Armory. Born in 1780, Lucas had graduated from Dickinson College at Carlisle, Pa. in 1809, served as a 1st lieutenant during the War of 1812, and then studied law at Winchester, Va. He established a practice at Shepherdstown, served two terms in

6. Talcott's letter of Aug.7,1836 to Rust is attached to his inspection report of Nov.3,1836, in HFNHP Photostat Collection,Vol. 1, p.65.

the Virginia legislature, beginning in 1819, and became a strong supporter of Andrew Jackson. From 1832 to 1836 he served two terms in Congress and established close ties with Van Buren and other high ranking members of the Democratic party.

Lucas took up his duties and established his residence at the Harper's Ferry Armory in April 1837.[7]

Lt. Col. George Talcott returned to Harper's Ferry in June 1837 to assist Lucas, the new superintendent, in getting large 1837 construction program underway. On June 25, Talcott reported the progress being made as follows:

> The change in the Superintendence of this Armory (caused by the resignation of Gen'l Rust and the appointment of Col. Lucas) together with the very large amount of money applicable to the improvement of the establishment, being in fact the appropriations for the years 1836 & 1837 and amounting to more than one hundred thirty thousand dollars; induced me to visit this place as early in the season as my other duties would permit. Although it is but seven month since the Armory was last inspected, yet from the very indifferent state in which its affairs were then situated an Inspection appeared highly desirable... and most of period (in June) was devoted to the outdoor affairs of locating buildings and aiding the Superintendent in all the various plans for additional buildings and improvements. These have been nearly all definitively adjusted, and will progress rapidly. Those at the Rifle Works (on the Shenandoah River) will shortly be completed and the untiring industry of the (new) Superintendent affords ground for the belief that all the interests committed to his charge will receive that attention which their importance deserves... [8]

7. Smith, Merritt Roe, Harpers Ferry Armory and the New Technology see pp. 258-259, for a more extended disaussion of Rust and Lucas.

8. Talcott's Inspection Report, June 16 to 25th,1837, HFNHP Photostat Collectionm Vol. 1, p.72.

Construction Projects:

A. Old Projects carried over from 1830-35:

1. The Trip Hammer Shop for Welding Barrels, 1834-37:

In the last chapter we have noted that the Congress provided $ 4,000 in 1830 to erect a "forging shop and tilt hammer" at the Musket Factory. Construction on the shop got underway in 1831 but came to a halt in 1832. In 1833 Congress provided an additional $ 13,300 to complete a" tilt hammer shop for welding barrels". When work resumed in 1834, a new site was chosen for the structure (see Bldg. No. 8 on Map. no. 6 and Bldg. No.11 on Map. No. 8), thus the money spent in 1831 was wasted as far as the final building was concerned.

In 1834-35, the great stone one-story workshop was erected about two-thirds complete at an approximate cost of $ 13,500. About $ 1,844.59 was left in funds to continue work on this structure on January 1,1836.

On March 1, 1837, Congress had appropriated an additional $ 6,656.00 to complete the trip hammer " commenced in 1834." Col. Bomford, Chief of Ordnance, justified his request for the additional money to Congress as follows:[9]

> The superintendent in charge of this armory states that the appropriation for the construction of the tilt-hammer shop has proved insufficient; partly in consequence of the great rise in price of materials and labor since the original estimate for this object was prepared, and partly owing to the change of the location of the building, as it became necessary to increase the width and depth of the foundations from five to seven feet, and enlarge the thickness about six feet more than was originally deemed sufficient, which greatly augmented the amount for excavation, walling, and filling; and the substitution of cast iron water wheels for tub wheels, which, though decidedly preferable, are more difficult in their construction, and of more expensive materials, yet more durable.

The records of the Paymaster of the Harper's Ferry Armory indicate

9. Estimates for 1837, Serial No. 303, Document 107, p. 3.

CHART NO. 25A

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

1836- 1841 March 1,1837
Completion of Tilt Hammer Shop $ 6,656.00 appropriated in 1837

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
(1) 1836	a 0	b 0	c 4,916.74	d 0	+++ 4,916.74	2,198.26
1837	e 2,268.32	f 1,189.52	g	h 875.48	4,333.32	
1838	i	j	k	l		
1839	m	n	o	p		
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL					9,250.46	

a. 20761 -1st series
b. 20654 " "
c. 677 2nd series
d. 761
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
0. 3917
p. 4246
q/ 4429
r. 4878

(1) Money carried forward from 1835:
$ 1,844.59.

Total available from 1836 to 39=$ 8,500.59

+++ Serial No. 304, Document 186, p.3- Annual report of the Ordnance Department for 1836 to Congress states that a total of $ $ 2,453.49 was spent on the construction of the tilt hammer shop in 1836.

that 4,916.74 was spent on the construction of the trip hammer shop shop in 1836,[10] and 4,333.32 in 1837,[11] to make total of $ 9,250.46 used to completed the structure in 1836-37. Total cost of the building, 1834 to 1837 appears to have been about $ 22,750.46.

Much of the 1836-37 money went for millwright work and machinery. Jacob Aspey, who had signed a contract on January 10, 1835, to do the millwright work on the new shop , had started to work in the 4th quarter of 1835, when he received $329.25 for constructing a wooden water wheel that was 20 feet in diameter.[12] He received at least an additional $ 1,842.43 for his services in 1836-37 as follows: 1st quarter of 1836: $ 603.80;[13] 2nd Quarter of 1836-$ $ 918.63;[14] and $ 320.00 during the 1st quarter of 1837 for"framing forebay, 2,400 feet, millwright work.[15]

In March 1836 the mason Johnson Garrett, who had erected the stone foundations and walls of the tilt hammer shop in 1834, received an additional $ 2,008.80 for his work on the shop, probably constructing its raceway.[16] On April 27,1835, Charles C. Starbuck, who had contracted to make five cast-iron "Reacting Water Wheels complete" at a cost of $ 310.00 each, received his final payment of $ 516.6, the balance of the total of $ 1,550.00 for the five wheels, on March 10, 1837.[17] In April 1837 the tinsmith Benjamin Snook was paid $98.34 for providing copper pipes for the tilt shop.[18]

10. R.G. 217-Records of 2nd Auditor, 2nd Series, File Nos. 677 and 761.
11. R. G. 217, 2nd Series, File Nos. 951, 1423, 1716, and 2092.
12. See Page 110 of text.
13. R.G. 217, 2nd Series, File 677, Voucher No. 61, March 8, 1836.
14. R. G. 217, 1st Series , File 20954.
15. R.G. 217, 2nd Series, File 951, Abstract C.
16, R.G. 217, 2nd Series, File 677.
17. R.G. 217- 2nd Series, File 951, Abstract C.
18, R.G. 217, 2nd Series, File 1423.

2. Three Water Wheels and Machinery for the Boring, Turning, and Stocking Shops:

In 1833 Congress had appropriated $ 8,400.00 to rebuilt the three old wooden water wheels in the turning, finishing or Bell Shop, the boring mill, and stocking shop at the Musket Factory (See Bldgs. No. 2, 3, and 5 on Map No. 4(1834), Map. No. 6(1837), and Map No. 7(1844). In 1834 Congress had voted an additional $ 26,040.47 " for the completion of the machinery in the turning , boring, and stocking shops." Added to the latter appropriation was also $ 10,074.39 for erecting new Musket Factory buildings and work on the Potomac Canal. On January 1,1836, the balances available for further work stood as follows:

Year	Account:	Spent	Balance Available	Total
1833	3 Water Wheels	$ 8,082.28	$ 317.72	$ 8,400.00
1834	New Machinery	27,166.54	8,948.32	36,114.86
Total:	1836	$ 35,248.82	$ 9,266.04	$ 44,514.86

The large expenditures on this project were due to the fact that the raceway or canal had to be widened and deepened at the three shops so that larger and more efficient water wheels could be installed. The best funded of all the projects in early 1836, $ 4,007.88 in work was charged against the completion of machinery account in 1836.[19] (See Chart No. 26, page 162, columns 4 and 5 from right for expenditures from these funds, 1836-39).

19. R.G. 217, 2nd Series-Three Wheels Expenditures- File 677 and 761 for $ 301.52 spent in 1836; File 2364 for balance of $ 16.20 spent during 2nd quarter of 1838; New Machinery Account

CHART 26

National Archives Record Group No. 217- Records of the United States General Accounting Office, Washington, D.C. Records of Second Auditor: Reccords and Accounts from the Paymaster of the U.S. Armory at Harper's Ferry, Virginia, relating to expenditures for Permanent Improvements:

Old Construction Money Carried Foreward to: 1836- 1841

YEAR	Repair of Walls of 4 Workshops	Slating the roofs of workshops	Erecting Store Houses	3 new water wheels	Completion of machinery	Repair of Potomac Dam	GRAND TOTAL	Repair of Potomac Canal
1836	0	0	0	301.52	3,706.36	0	$ 4,007.88	0
1837	0	0	0	0	2,898.69	88.00	2,986.69	
1838	650.05	186.58	1,000.00	16.20	2,206.21	705.66	4,764.70	
1839	0	0	749.92	0	0	0	749.92	
1840	0	0	0	0	0	0	0	
1841	0	0	0	0	0	0	0	
TOTAL:	650.05	186.58	1,749.92	317.72	8,811.26	793.66	12,509.19	
BALANCE LEFT:	0	0	2,825.02 +	0	++ 137.06	0	2,962.08	
APPROP-RIATION	650.05	186.58	4,575.02	317.72	8,948.32	793.66	$ 15,471.35	1,853.66

Money for these projects at the U.S. Musket Factory had been appropriated ,1830-35.

Also carried forward, $ 1,844.59 in Forging Shop, Tilt Hammer account.

++ $ 137.06 reverted to surplus fund of U.S. Treasury in 1839.

Grand Total Carried Foreward, All Projects: $ 19,169.60, January 1,1836.

+The balance of $ 2,825.02 reverted to the U.S. Treasury surplus fund in 1839 and was not used at Harpers Ferry.

CHART NO. 27

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

THREE NEW WATER WHEELS FOR THE BORING, TURNING & STOCKING SHOPS — 1836- 1841 — Money carried forward from 1833. ($ 317.72)

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 0	b 0	c 228.52	d 73.00	301.52	16.20
1837	e 0	f 0	g 0	h 0	0	16.20
1838	i 0	j 16.20	k 0	l 0	16.20	0
1839	m	n	o	p	0	0
1840	q	r	s	t	0	0
1841	u	v	w	x	0	0
TOTAL					317.72	0

COMPLETION OF MACHINERY IN THREE SHOPS — 1836- 1841 — Money carried forward from 1834:

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 2,434.15	b 5,83.36	c 473.00	d 215.85	3,706.36	5,241.96
1837	e 171.41	f 288.93	g 484.32	h 1,319.19	2,263.85	2,343.37
1838	i 0	j 144.47	k 1,223.15	l 838.59	2,206.21	107.06
1839	m 0	n 0	o 0	p * 137.06	* 137.06	0
1840	q	r	s	t	0	0
1841	u	v	w	x	0	0
TOTAL					8,948.32	0

File Nos.

a. 20761 1st series.
b. 20654 " "
c. 677 2nd series.
d. 761
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3424
m. 3703
n. 3695
o. 3971
p. 4246.

3. Two shops for tempering springs and polishing barrels, two houses for fireengines, and an addition to the Stocking Shop..... 1,821.45

* $ 137.06 reverted to the Treasury Surplus fund in 1839, Serial No. 365, Document 107, p. 3.

The new machinery fund of $ 36,114.86 had included $ 7,924.50 to erect an Annealing Shop and Proof House, a carpenters shop, and a machine shop, which had all been built in 1834-35. An additional $ 1,821.45 had been requested to build two shops for tempering springs and polishing barrels, two fire engine houses, and for making an addition to the stocking shop(Bldg. No. 5. These four small shops and the addition were probably erected in 1836.[20]

During 1836 we find the following construction being charged against the Completion of Machinery Account: $ 200.00 for the services of George W. Roger who served as engineer on the Repair of the Musket Factory Canal project; $ 1,478.58 to the mason Johnson Garrett for mason work, both in the 1st quarter of 1836 and in the second quarter;[21] on June 10,1836 the carpenter James Foley received $ 13.00 for making 8 steps and 20 feet of handrail or balustrade at the new machine shop(which had been built in 1834 under this fund).[22]

The mason Joseph Shoemaker was also paid from this fund, $ 63.12 in the first quarter of 1836 and $ 62.13 on May 15,1836. In the latter case his voucher specified it was for 35½ days mason work"underpining the walls of the Boring Mill."[23]

The $ 9.266.04 available in these two accounts, except for $ 137.06 was expended by 1838; the latter amount reverted to the Treasury surplus fund.(24)

20. Paymaster vouchers specifying the construction of these structures were not found in R.G. 217-2nd series. However,in 1846 the mason William Collins was paid $ 70,93 for laying 12,230 brick in the forge and furnace of the tempering shop.-3rd Series - 4403; Also-during the 3rd quarter of 1841 the slater William Bayley was paid for slating the roof of the buffing or polishing shop at the Musket Factory-2nd series 6465-V.79.

21. R.G. 217-1st series-20761.
22. R.G. 217-1st series- 20954-2nd quarter 1836.
23. R.G. 217- 1st series- 20761 and 2nd series-677.
24. The money reverted in December 1839, see Serial No. 365, Document 107, p. 3.

3. Slating Roofs and Repair Walls, Old Workshops:

Old funds totalling $ 836.63, from two accounts which had been on the Armory books since 1830 and 1833, were utilized to make repairs to Musket Factory shops during 1838. The slating of the roofs of the workshops account, dating from 1830 and containing $ 186.58, was used and exhausted during the second quarter of 1838 to make repairs to the roofs of the Musket Factory shops.[1] The slater William Bayley, who began slating roofs at the Armory in 1827, was still engaged at this trade at the Armory during the years 1836-41.[2]

The repair of the walls of four workshops account, established in 1833 and still containing $ 650.05, was utilized for necessary repair work on the old Musket Factory shops during the third quarter of 1838. Of the total of $ 650.05 thus spent, $ 341.06 was used to purchase lumber from Lewis Wernwag and Peter Derry.[3] Carpenter John Hyatt and his two journeymen carrpenters received a total of $ 127.25 for 26 days of labor on the shops;[4] and the plasterer Jerry(Jeremiah) Harris was paid $ 67.82 for plastering 417 square yards of wall in the shops.[5] (See Chart 28, p. 166).

1. R.G. 217, 2nd Series, File 2364.
2. R.G. 217, 2nd Series, File 3424-Voucher 46B; File 6465, Voucher 79.
3. R.G. 217, 2nd Series, File 2729, Voucher 100, to Lewis Wernwag on August 28, 1838 for $ 69.49; To Peter Derry on September 28,1838, for $ 271.57.
4. R.G. 217, 2nd Series. File 2729, To Hyatt, Sept. 5, 1838.
5. R.G. 217- 2nd Series, File 2729, Vouchers 10A and 103, July 18 and Sept.,1838, to J. Harris.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

SLATING ROOFS OF WORK SHOPS 1836-41 Funds carried forward from 1830.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 0	b 0	c 0	d 0	0	186.58
1837	e 0	f 0	g 0	h 0	0	186.58
1838	i 0	j 186.58	k 0	l 0	186.58	0
1839	m	n	o	p	0	0
1840	q	r	s	t	0	0
1841	u	v	w	x	0	0
TOTAL					186.58	0

REPAIR OF WALLS OF FOUR WORKSHOPS 1836- 1841 Funds carried forward from 1833.

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 0	b 0	c 0	d 0	0	650.05
1837	e 0	f 0	g 0	h 0	0	650.05
1838	i 0	j 0	k 650.05	l	650.05	0
1839	m	n	o	p	0	0
1840	q	r	s	t	0	0
1841	u	v	w	x	0	0
TOTAL					650.05	0

a. 20761- 1st series
b 20954- 1st series
c. 677- 2nd series
d. 761 - ' "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3424.

4.The Erecting Storehouse Accounts

$ 4,575.02 of the total of $ 8.559.87 originally appropriated in 1834 was carried forward for use in the 1836-41 period. A store house for iron and a coal bin had been erected in 1834 at an approximate cost of $ 1,710.15. Two streets of Harpers Ferry, Shenandoah Street and Potomac Street(the latter the central avenue running between the two rows of Musket Factory shops), had been graded and paved in 1834 at a cost of $ 1,516.49. A balance of $ 983.51 was left from the street fund that could be used to paint the public buildings. $ 900 was also provided to construct a river wall on the margin of the Potomac to protect the public works. The wall and painting projects thus called for about $ 1,883.51 to be spent at the Musket Factory. The remaining two projects with $ 3,579.72 in their accounts, called for sinking 3 wells on camp hill and making repairs to the quarters of the Paymaster and the Armory Clerks.(See Chart 29, p. 168).

Of the 4,575.02 carried forward from 1834, a total of $ 1,749.92 during the last quarter of 1838 and the first quarter of 1839.[1]

On December 31,1839, the balance of $ 2,825.02 left in the Store House Account reverted to the U.S. Treasury Department surplus fund and was never utilized at the Harper's Ferry Armory.[2] It is not known just how this total of $ 1,749.92 was applied at the Armory in 1838-39. $ 2,079.72 of the reverting money, however, was probably from the repair to Paymaster's and Clerks' quarters fund.

1. R.G. 217, 2nd Series, File No. 3424, $ 1,000.00 in 4th Quarter of 1838; File 3703, $ 749.92 during the 1st quarter of 1839.
2, Serial No. 365, Document No. 107, p.3. "Statement of the appropriations for the service of the War Department for the year 1839, made pursuant to the provisions of the second section of the act of Congress of 1st May, 1820, entitled '" An Act in addition to the several acts for the establisment and regulation of the Treasurym War, and Navy Departments.'"

CHART 29

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

ERECTING STOREHOUSES

1836- 1841

Money carried forward from 1834

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 0	b 0	c 0	d 0	0	4,575.02
1837	e 0	f 0	g 0	h 0	0	4,575.02
1838	i 0	j 0	k 0	l 1,000.00	1,000.00	3,575.02
1839	m 749.92	n 0	o 0	p 0	749.92	** 2,825.02
1840	q 0	r 0	s 0	t 0	0	
1841	u 0	v 0	w 0	x 0	0	
TOTAL					1,749.92	** 2,825.02

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878
s. 5252
t. 5624
u. 5785
v. 6195
w. 6463
x. 6718

Money appropriated in 1834 to

(1) erect Store House for Iron and coal Bin.....$1,710.15
(this built in 1834).
(2)repairing Paymaster's and Clerks' quarters..... 2,079.72
(3)Constructinga river wall on the margin of the Potomac to protect the public works..... 900.00
(4) for sinking three wells on Camp Hill..... 1,500.00
(5) for grading and paving Potomac Street between the public shops, and Shenandoah Street, and for painting some of the public bldgs. 2,400.00
($ 1,516.49 of this money was spent in 1834 for paving and grading street, leaving balance of $ 983.51 available for painting

Total Appropriation, 1834: $ 8,559.87

** $ 2825.02 reverted to the U.S. Treasury surplus fund in 1839 and was not utilized at Harper's Ferry Armory.

Serial No. 365, Document No. 107, p.3.

Of the grand total $ 14,677.69 available in five old accounts for work at the Musket Factory(not including $ 793.66 in the repair of the Potomac dam project, see Chart 26, p. 162), about $ 11,715.53 was expended for repair and improvement, chiefly at the Musket Factory, and the balance of $ 2,962.08 was returned unused to the U.S. Treasury Department surplus fund in 1839.

B. Construction from new(1836-39) funded projects:

As has been mentioned (p. 155), Congress, in 1836-39, appropriated a total of $ 106,059.00 for the following projects at the U.S. Musket Factory:

1. Making new machinery.....	$ 43,725
2. For constructing three new buildings and completing the tilt hammer shop.....	15,706
3. For constructing a river wall.....	40,628
4. For digging a well.....	1,000
5. For purchase of one acre of land.....	5,000
Total provided in new appropriations:	$ 106,059 (1)

1. New Machinery, 1836 and 1838:

The Chief of Ordnance requested and Congress appropriated on July 2,1836, $ 23,725.00 ."For the purchase and erecting of new and improved machinery for facilitating the manufacture of arms.."....

Col. Bomford explained to Congress that this money would be used for the following purposes: 2

1.Does not include additional $ 11,719 provided for repair of the Potomac Canal.

2. Special estimate for 1836, Serial No.288, Document 90, pp.7,8. Lt.Col. George Talcott, in inspection report of Harper's Ferry Armory, dated November 3,1836 wrote" The Harper's Ferry Armory continues to labor under the want of many useful machines, but it is hoped that another year will not pass without application of the funds appropriated for improving this branch... "

A. The superintendent in charge of the Harper's Ferry Armory represents, that a number of new and improved machines are very necessary, and almost indispensable, with the regard to the facility, accuracy, and economy, in the manufacture of small arms. They are very essential in extending the improvements now making; they are also required in order to better systematize the condition of the armory, for classification and equalizing gradation of the prices paid to workmen.

By the erection of new machinery it is estimated that a great saving will be effected, in particular operations, in the fabrication of the various tools made. All these objects, it is believed, would be accomplished by the erection of new machinery, for which an appropriation is now estimated.

In response to the Ordnance Department's second request, Congress provided an additional $ 20,000.00"for procuring new machinery for the Harper's Ferry Armory on July 7,1838.[3] With this appropriation, a total of $ 43,725.00 was made available to modernize the machinery of the Musket Factory during the years 1836 to 1841.

Chart No. 30, page 171 indicates that the annual rate of expenditure from these two appropriations for new machinery was as follows:

1837:	$ 2,585.92.
1838:	5,086.56
1839:	36,052.52
Total:	$ 43,725.00

In June 1837,as has been mentioned, Lt. Col. George Talcott visited the Harper's Ferry Armory, went over the ground, picked out the site for each new structure, and also approved the plan for each building that was to be erected.[4]

3. U.S. Statues at Large Vol.V, p.267.

4. Inspection Report of Lt.Col. Talcott, June 16 to 25th, 1837, in HF NHP Photostat Collection, Vol. 1, p.72.

CHART NO. 30

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

FOR NEW MACHINERY

$ 23,725.00 appropriated in 1836
$ 20,000.00 appropriated in 1838

1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a	b	c	d		23,725.00
1837	e 634.84	f	g 560.59	h 1,390.49	2,585.92	
1838	i 421.23	j 262.67	k 485.18	l 3,917.48.	5,086.56	20,000.00
1839	m 4,379.75	n 7,387.99	o 12,386.26	p 11,898.52	36,052.52	
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL					$ 43,725.00	

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. Serial No. 363, Document 2, p.90-91. State of the Account of each appropriation applicable to the service of Ord,Dept.,during the year ending the 30th Sept.1839.
m. Ibid.
n. Ibid, pp. 92-93.
o. Ibid., pp. 92-93.
p. Serial No. 375, Document No. 1,pp.74-75,Statement for year ending 30th Sept.1840.
q. Ibid.,
r. Ibid.
s. Ibid.
t.

Amount special for purchase of materials charged against this account in period June 30,1837 to Dec. 31,1837= $ 872.71.

2. Store House for Condemned Parts, 1837

On July 2 ,1836 Congress appropriated $ 3,400.00

For the erection of a store house to contain condemned component parts of arms, defective materials, scraps, &c., of stone, 80 by 30 feet, two stories high, with slated roof.... 1

The Chief of Ordnance informed Congress that:

This store=house is much wanted as a place of deposite, preservation, and location, of various materials, and defective component parts of arms. Its construction can be arranged, that should an emergency arise, requiring the fabrication of an increased number of arms at this armory, it can be converted into a work shop, without much difficulty or expense. 2

The Paymaster's vouchers covering the construction of the Store House for condemned parts, a stone building with slate roof, two stories and 80 by 30 feet, were not located. This structure should have been commenced in July 1837 and have been completed by the end of 1837 or the first half of 1838.

Bldg.No. 10 on Map No. 5(1837) may be the store house for condemned parts. There are, however, problems, because a unknown Bldg. No. 10 appears in the same position on Map 4 (1834), p. 122 . The 1834 structure may have been a charcoal house, perhaps.

1. Special estimate for 1836, Serial No. 288, Document No. 90, p.7,8.

2. Ibid, p.8.

CHART NO. 31

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

STOREHOUSE FOR CONDEMNED PARTS — $ 3,400.00 appropriated in 1836. — 1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a	b	c	d		
1837	e	f	g	h		
1838	i	j	k	l		
1839	m	n	o	p		
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL						

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878
s. 5252
t. 5624
u. 5785
v. 6195
w. 6465
x. 6718 -2nd series.

The Paymaster's vouchers relating to the construction of this structure were not located in the R.G. 217 files during June 1980.

3. A Coal House for the Tilt Hammer Shop,

On July 2,1836, Congress appropriated the sum of $ 650.00

> For the erection of a house to contain pit coal, at the tilt hammer shop, 30 by 20 feet, and 10 feet high...

Explaining the need for the structure, Col. George Bomford wrote:

> "The erection of a coal-house is very necessary, in consequence of there being none in the vicinity of the (new) tilt-hammer shop, at which place the greater part of the coal used is consumed."[1]

This stone building, 30 by 20 feet and 10 feet high, was known as the coal house or coal bin and was located adjacent to the new trip hammer shop for welding barrels (See Bldg. No. 8 on Map No. 6 or Bldg. No. 11 on Map No. 8 (1848), for the trip hammer shop- the coal bin itself, however, is not delineated on either map). (See Map No. 9(1837), page 195).

The new coal bin was apparently constructed in September 1837 by the mason George Bau (?) at an approximate cost of $ 304.05 (See Charts 32-A-B, pp. 175-6). About 80 3/4 perches of stone mortar wall were erected in this structure.[2]

1. ,1836 Estimate, Serial No. 288, Document 90, pp.7,8.

2. R.G. 217- 1716- Abstract B-3rd quarter of 1837.

CHART 32 A

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

STORE HOUSE FOR COAL $650.00 appropriated in 1836.

1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a	b	c	d		
1837	e	f 63.37	g 240.68	h	$ 304.05	
1838	i	j	k	l		
1839	m	n	o	p		
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL					$ 304.05	

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878
s. 5252
t. 5624
u. 5785
v. 6195
w. 6465
x. 6718 -2nd series.

CHART 32B

R.G.217 Construction of the COAL HOUSE OR COAL BIN, 1837 U.S. Musket Factory

File No.	Voucher No.	Artisan	Date	Amount	Remarks
1422	179	Long Colbit	6/37	$ 31.87	for 42½ perches of stone delivered to site, for erection of coal bin.
1423	178	Michael Ledwick	6/17/37	$ 31.50	For quarrying and delivering 40 perches of stone for erecting coal bin= $30.00 and $ 1.50 for 3 days labor erecting coal bin.
1716	71A	Lewis Wernwerg	9/20/37	$ 30.00	for 20 stone lintels for coal bin.
1716	72A	George Bau(/) ?	9/22/37	$ 137.12	For mason work, probably erecting coal house or bin: Excavating earth: $10.00 for laying 80 3/4 perches of stone wall=$121.12 Laying 37 feet 6 inches of cornce= $ 6.00.
1716		for stone	7/15/37	$ 68.75	got 82½ perches of stone delivered to the site, July 15, 1837
1716		Other	3rd qr	$ 5.13	other costs
Total	3rd	quarter of 1837		$ 240.68	
Total		recorded 1837	1837	$ 304.05	For coal house or bin

4. A Forge for Scrap Iron:

On July 2,1836, the Congress appropriated in response to an Ordnance Department request, $ 5,000.00

> For the erection of a forge and fixtures for working up scrap iron into bars, and for faggoting steel, of brick or stone, with slated roof.

Explaining the need for this building, the Chief of Ordnance wrote:

> A forge at this armory is much wanted to work up scraps, old gun barrels, borings and turnings, that unavoidably accumulate. Its erections, besides its utility in saving scraps, will enable the superintendent to obtain iron of the quality and dimensions desired without delay.
>
> It is estimated that, by the use of the forge, about three pounds of good iron may be made from the borings and turnings of each musket. The scrap iron at the armory, if sold at public auction, will not command more than two cents per pound; but if worked up into bars, it will be equal in value to three or four cents per pound.[1]

The Paymaster's Vouchers for labor to build this structure have not been located. His records,however, show that at least $ 665.25 was spent to purchase materials to construct the Forge for Scrap Iron, as follows: June 30-Dec.31,1837- $ 56.96.[2]; in 2nd quarter of 1838, $ 115.00 for 600 feet of plank and $ 267.03 for 143 feet 3 inches of stone for foundation.[3]; and in the second quarter of 1839, $ 226.26 was paid on June 30,1839 to Russell and Byrne for 362 2/3 feet of cut stone for the forge's forebay.[4] This suggests that the forge may have been erected in in 1838-39. There are problems, however, for Map No. 8 (1848) lists no such building as "The Forge". From mention of its forebay, the forge should have been located on the north bank of the canal and in the southern line of workshops. It is possible the the Forge was not erected as a separate structure, but built as an alteration to the Finishing or Bell Shop in 1838-39, thus accounting for the large chimney on that shop.

1. 1336 Estimate, Serial No. 288, Document No.90, p.7,8.
2. R.G. 217 - 2092- Statement of Special Appropriations charged for materials during the last 6 months of 1837.
3. R.G. 21 - 2364.
4. R.G. 217- 3695- Voucher 113.

CHART NO. 33

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

FORGE FOR SCRAP IRON — $ 5,000.00 appropriated in1836

1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a	b	c	d		
1837	e	f	g	h 56.96	56.96	
1838	i	j 382.03	k	l	382.03	
1839	m	n 226,26	o	p	226.26	
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL					$ 665.25	

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878
s. 5252
t. 5624
u. 5785
v. 6195
w. 6465
x. 6718 -2nd series.

Amount for purchase of materials charged against this account during the period June 30, 837 to Dec.31,1837= $ 56.96.

5 A Well at the Grinding Mill:

On July 2,1836, Congress voted the sum of of $ 1,000.00 "for sinking a well and putting in a pump opposite the grinding mill." In justifying the request for this money to Congress, the Chief of Ordnance wrote:

> K. The sinking of a well is considered very necessary, in consequence of no pure water for use being within three or four hundred yards of the new tilt hammer shop, and many of the houses...[1]

The grinding mill,Bldg. No. 9 on Map No. 8 was located on the north bank of the Armory Canal in an isolated position about half way between the the new tilt hammer shop (Bldg. No. 11) and the Stocking Shop. (Bldg. No. 5 on the 1848 Map-Map No. 8).

The Paymaster's Account reveal that work on sinking the well got underway in the 3rd quarter of 1837 and was completed during the last quarter of that year; the total cost of the well was $ 731.31.[2]

1. 1836 Estimate, Serial No. 288, Document No. 90, p. 7,8.
2. R.G. 217- files 1423, 1716, and 2092. Expenditures on the well were as follows: 2nd qr. $ 8.29; 3rd qr., $ 374.41, and 4th qr. $ 348.71. Total, 1837, was $ 731.41.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

SINKING WELL AT THE GRINDING MILL 1836- 1841 $1,000.00 appropriated in1836

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a	b	c	d	0	1,000.00
1837	e	f 8.29	g 374.41	h 348.71	731.41	
1838	i	j	k	l		
1839	m	n	o	p		
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL					$ 731.41	

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878
s. 5252
t. 5624
u. 5785
v. 6195
w. 6465
x. 6718 -2nd series.

MAP NO. 5

Map No. 2- Sketch showing two practicable locations for the Balto. & Ohio R. Road through the village of Harper's Ferry, 1838

Scale 100 feet to inch. Ordnance Office, Drawer 5, Portfolio 1 No. 5, no date, but drawn in 1837-38.

Photostatic copy of this map received from Vicksburg NHP in 1958. Location of the original map is unknown.

Harpers Ferry National Historic Park Map No. 35, in Map Case Drawer No. 12.

Legend for Map No. 2 -1837-38 Sketch showing two practicable routes through the village of Harpers Ferry. (Legend prepared by Historican Charles W. Snell, 1981).

Numbered buildings owned by the U.S. Armory; lettered building owned by private individuals.

MUSKET FACTORY BUILDINGS, 1837-38

1. Superintendent's House, 1808-09. 2-story, brick.

2. Old Bell(Finishing or Turning) Shop, 1809-10, 2-story, brick, 131 by 45 feet. Projecting wing to south may be the Polishing Shop (24),erected 1837.

3, Old Boring Mill, 1799. 2-story, brick, 120 by 30 feet.

4. Store House and Master Armorer's Office, 1799, 2-story, brick, 80 by 30 feet.

5. Old Stocking Shop, 1808-09, 2-story, brick, 111 by 30 feet.

6. Additions to Old Stock Shop probably include: Shop for Half-Stocking Machinery, 1827-28, 2-story brick, 20 by 30 feet, plus 1837 addition.

7. Perhaps Fire Engine House, frame, 1837, or Tempering Shop, 1837.

8. Perhaps Fire Engine House, frame, 1837

9. Carpenters Shop, 1834, 1-story, stone.

10. Machine Shop, 1834, 1-story, stone.

11. Grinding Mill, 1831 , 1 -story, stone.

12. Coal House, 1837. One story (10 feet high, stone, 30 by 20 feet.

13. Tilt Hammer Shop for Barrel Welding, 1834-37. One-story, stone.

14. Waste Weir for U.S. Musket Factory Canal.

15. Probably Store House for Stocks, 1832. Stone, 65 by 30 feet. 1-story.

16. Perhaps Store House for Charcoal, 1829, frame, one-story.

17. Annealing Shop and Proof House, 1834, one-story, stone.

18. Smiths or Forging Shop, 1810-12, 2-story, brick, 80 by 30 feet. 10 forges.

19. Smiths or Forging Shop, 1808-09, 2-story brick, 120 by 30 feet. 16 forges.

20. Smiths or Forging Shop, 1808-09, 2-story, brick, 130 by 30 feet. 16 forges.

21. Perhaps Store House for Iron and Bin for Coal, 1834, brick, 1-story.

22. Perhaps Store House for Condemned Component Parts of Arms, Scraps, 1837-38, 2-story, stone, 80 by 30 feet.

23. Captain John H. Hall's Browning Shop,, 2-story, wood, 18 by 18.Office of Armory Superintendent, ca. 1817 to 1832.

Buildings on U.S. Arsenal Square

24. Large Arsenal, 1799-1800. 2-story, brick, 125 by 32 feet.

25. Ice House, probably frame, about 24 feet by 24 feet.

26. Small Arsenal, 1806-07, 2-story, brick, 68 by 36 feet.

Privately Owned Buildings on Wager Ferry Lot Reservation:

A. Lot No. 12 Occupied by two two-story brick stores, with dwellings on the upper floors . Northern structure 35 by 30 feet, building owned by Richard B. Doran and ground by Gerard B. Wager; Southern building, 25 by 30 feet. Building erected in 1831.

B. Lot No. 11. Two-story duplex building 40 by 40 feet, with two stores on first story and residences on the upper floors, built 1831-32.

C . Lot No. 10: Two-story stone house about 40 by 29 feet, built 1837-38, containing a story and dwelling, and, or a small frame building with two small shops dating from 1830. In 1843 Benjamin M. Snook's tinsmith shop was located in the wooden shop on Lot 10.

D. Lot No. 9. 2½ story stone house, 40 by 24 feet. Store and dwelling.

E. Lot No. 8. Vacant in 1837-38.

G. Lot No. 7. Three-story brick hotel, 14 rooms, built by James Foley, master carpenter, 1837-38 45 by 29 feet.

H. Lot No. 6: Three-story brick hotel , 14 rooms, built by James Foley, carpenter for Gerard B. Wager in 1837-38 , 45 by 29.

Buildings on G and H known as the U.S. Hotel in 1839, operated by James Foley.

I. Wager Lot No. 2, owned by Gerard B. Wager. Probably a small frame shop.

J. Wager Lots 4 and 5: Tavern - western half on Lot No. 5, a three-story brick Hotel, the National Hotel, erected by Samuel Gibson in 1834, also containing a store; eastern half on Lot No. 4, a two-story stone house built by the Wager family ca. 1825-30, owned by Gerard B. Wager.

K. Wager Lot No. 15. Old frame Harper's Ferry Hotel. Subdivision 1,2 3 of Lot 15.

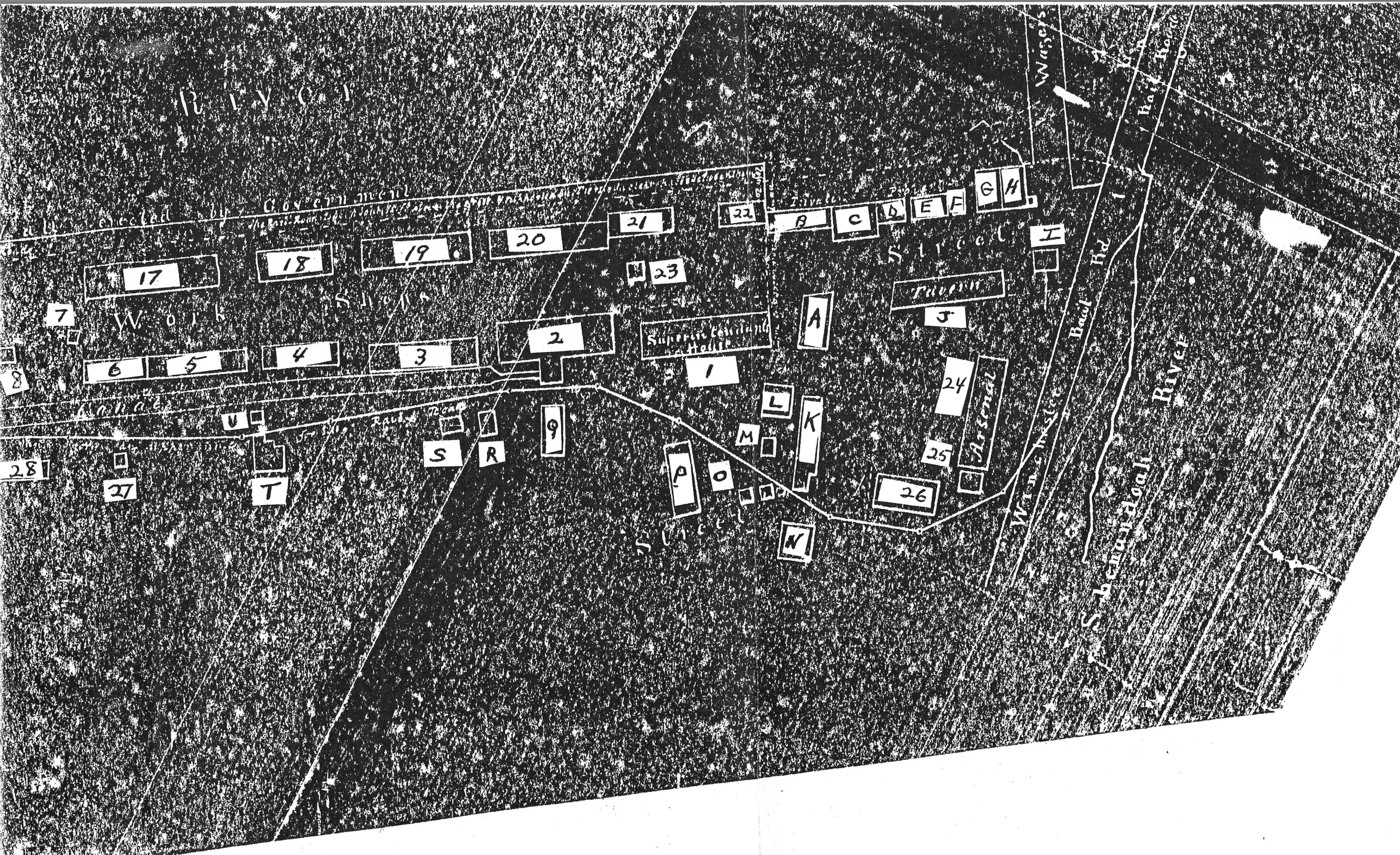
L. Wager Lot No. 14, in part, service building for hotel?

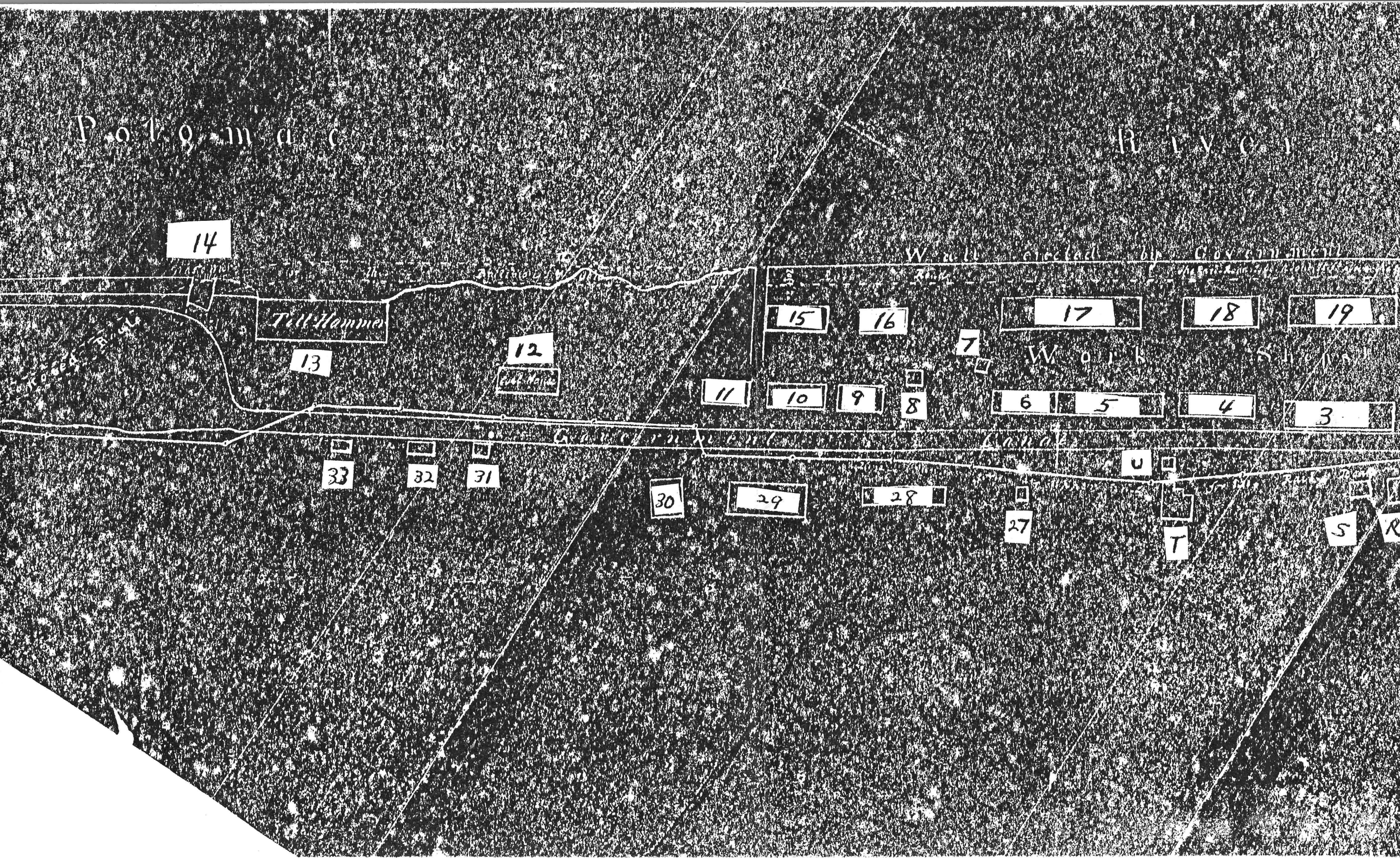
M. Wager Lot 15 ,service building for hotel? Subdivision 2 or 3 of Lot 15.

N. Wager Lot 51, 2½ story brick building, shop and dwelling, 1832.

O. Wager Lot 15, two small frame shops, probably. Subdivision 1 of Lot 15.

P. Wager Lot 15, subdivision 4, Stable, possibly located on Wager Lot No. 16.


Wasers
Back Rd
Back Rd
Street
Tavern
Superintendents House
Arsenal
Wynchester
Shoreham
River
Work Shops
Government
Private
Private
Private



Potomac River
Wall erected by Government
Tilt Hammer
Work Shops
Government Canal
14
13
12
15
16
17
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MAP NO 6

"MAP Shewing the Routes surveyed for the BALT. & OHIO RAIL ROAD along the public grounds on the Potomac, at & above Harper's Ferry upon which the Company have applied to Government for permission to locate and construct their road. Scale: 400 feet = 1 inch. Signed Benj. H. Labrobe, Engineer of Location and Construction, Balt. & Ohio R.Rd.." No date, but prepared in 1837 and used to accompany an agreement between the U.S. and Railroad dated November 3,1838.

National Archives Record Group No. 121, Public Buildings Service, Harpers Ferry Laminated Material, Map No. 3. Drawer 5, Portifolia No. 6. Washington, D.C.

Section of map showing buildings of the U.S. Musket Factory on the Potomac:

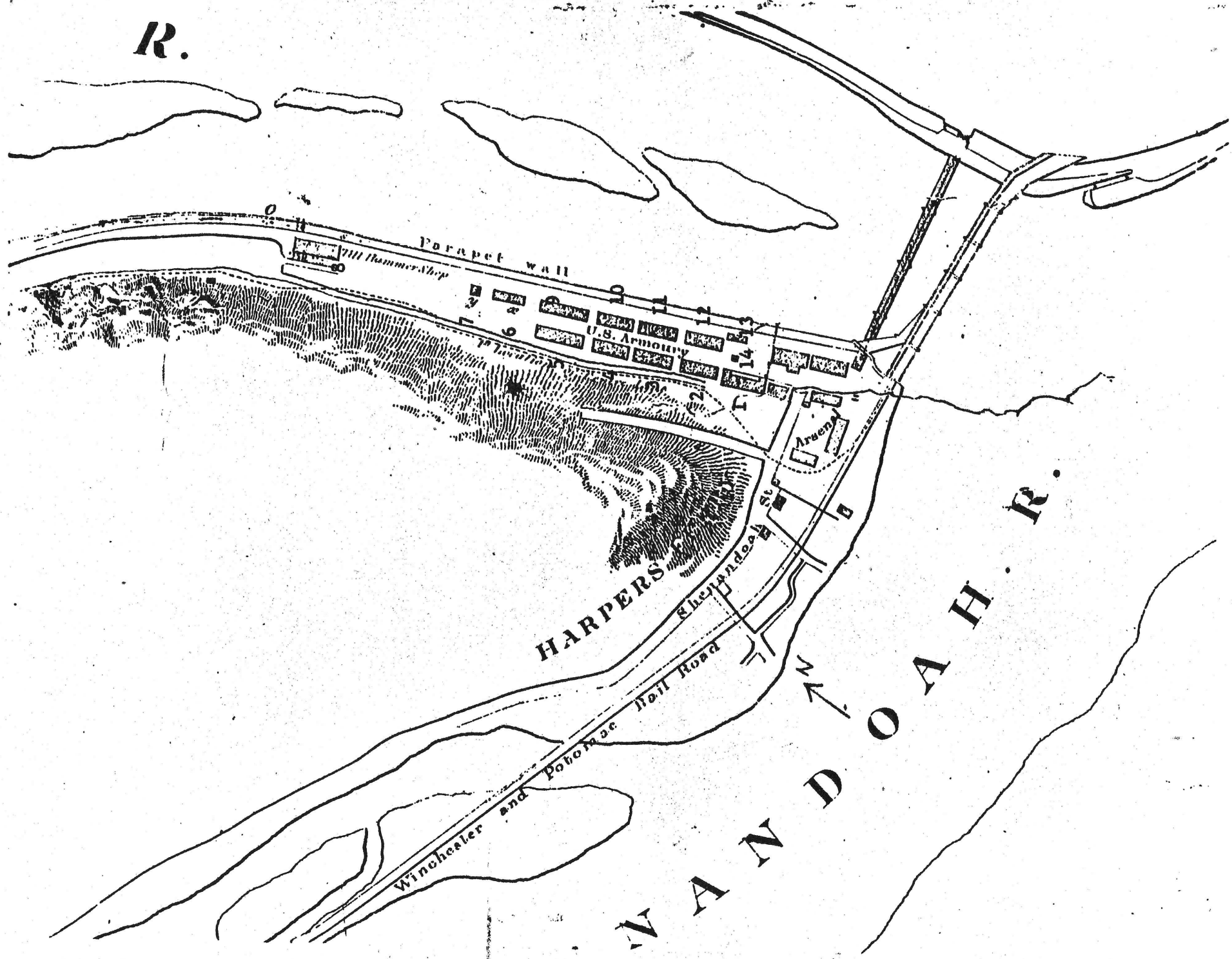
Numbers added by author.

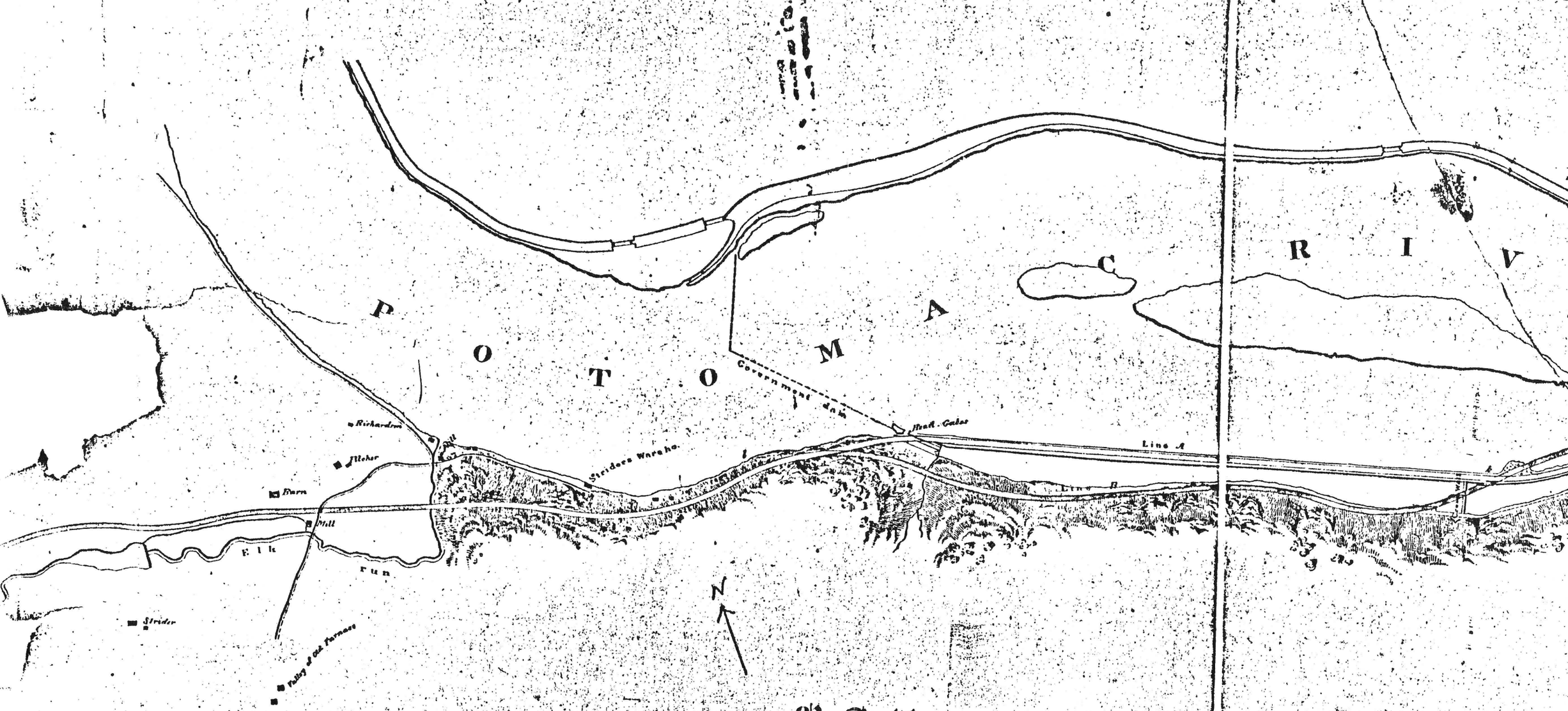
Musket Factory Bldgs.

No. 1 Superintendent Rust's Residence. 1808-09.
No. 2 The Bell Shop , 1809-10. Water wheels & machinery
No. 3. Boring Mill,1799-1800,water wheels & machinery.
No. 4. Storehouse, 1799-1800. No water wheels or machinery.
No. 5, Stocking Shop,1808-09, water wheels and machinery.
No. 6. Store House for Stocks. 1832.
No. 7. Perhaps Store House for Charcoal,1828.
No. 8. Tilt Hammer and Forging Shop, erected 1834-38.
No. 9. Annealing Furnace and Proof House, 1834.
No. 10. Smith's Shop, 10 forges, erected 1808-09.
No. 11. Smiths's Shop, 16 forges, erected 1808-09.
No. 12. Smiths's Shop, 16 forges, erected 1808-09.
No. 13 Store House for Condemned Parts,1837 ? or Store House for Iron,1834?
No. 14 Capt. John H. Hall's Browning Shop.

Musket Factory Shops under Construction in 1837 included:

1. Store House for Condemned Parts, stone, 2 stories, 80 by 30 feet, with slate roof. Cost, $ 3,400.00
2. Forge for Scrap Iron, cost $ 5,000.00
3. Coal House at the Tilt Hammer Shop, 30 by 20 feet, 10 feet high, cost $ 650.00. Stone.
4. Polishing Shop
5. Tempering Shop
6-7. 2 Houses for Fire Engines.


R.
Parapet wall
Hammer Shop
U.S. Armoury
Arsenal
HARPERS
Shenandoah
Rail Road
Winchester and Potomac
SHENANDOAH R.



MAP

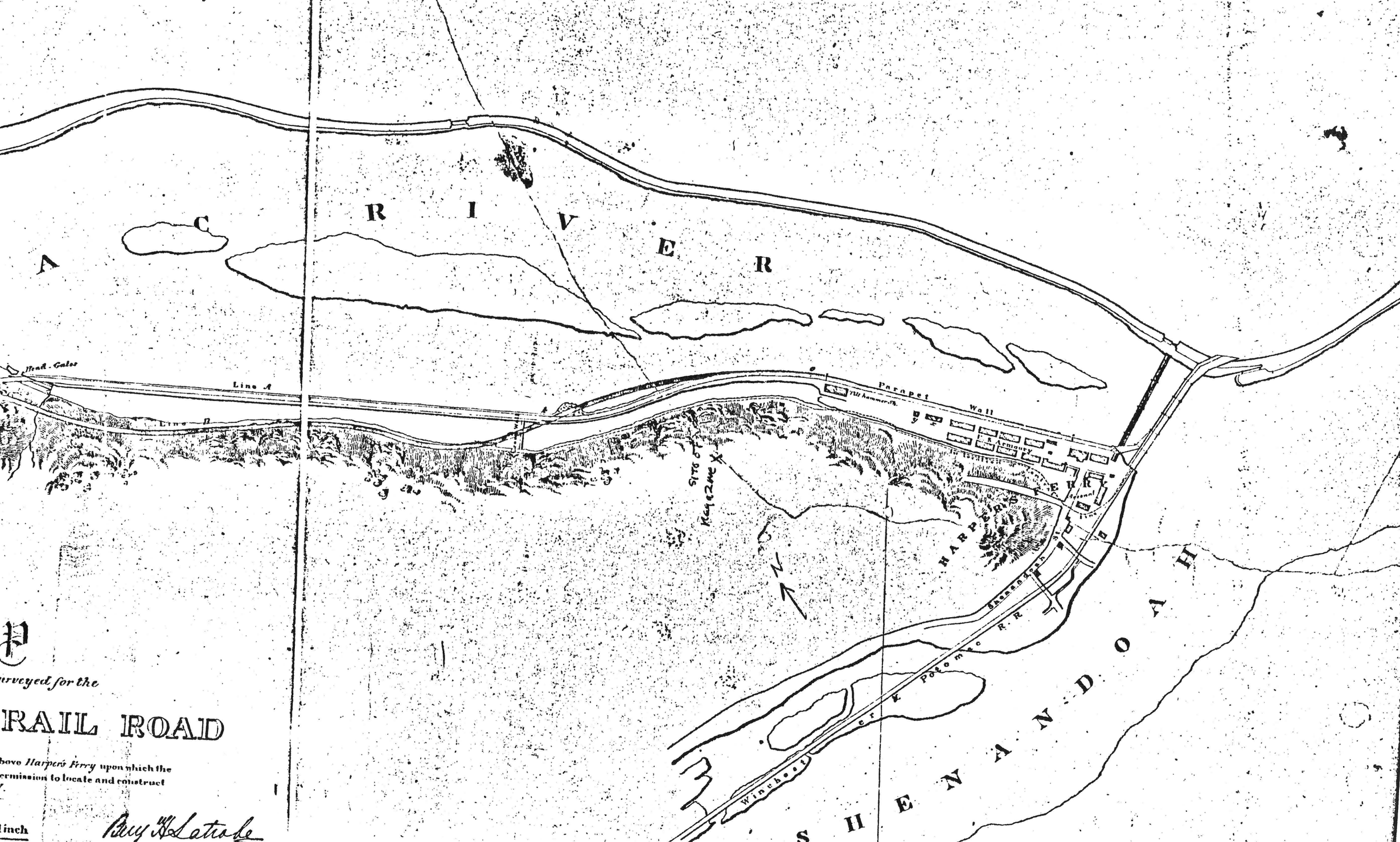
shewing the routes surveyed for the

BALT. & OHIO RAIL ROAD

along the public grounds on the Potomac, at & above *Harpers Ferry* upon which the Company have applied to Government for permission to locate and construct *their road.*

Scale, 400ft – 1inch

Benj. H. Latrobe



P

urveyed for the

RAIL ROAD

bove Harpers Ferry upon which the
ermission to locate and construct

Inch

Benj H Latrobe

MAP NO 7

"MAP of the Relative Position of the Reserved (Wager-owned Six Acre Reservation) Land & Public Works at HARPERS FERRY, VA., 1844." (Copy prepared by Major John Symington, Superintendent of the Harper's Ferry Armory, March 22,1847).

National Archives Record Group 121, Public Buildings Service, Harpers Ferry Laminated Material(Drawer No. 5, Portfolio No. 1).

Section of Major Symington's detailed map.

Bldgs. in the U.S. Musket Factory, 1844

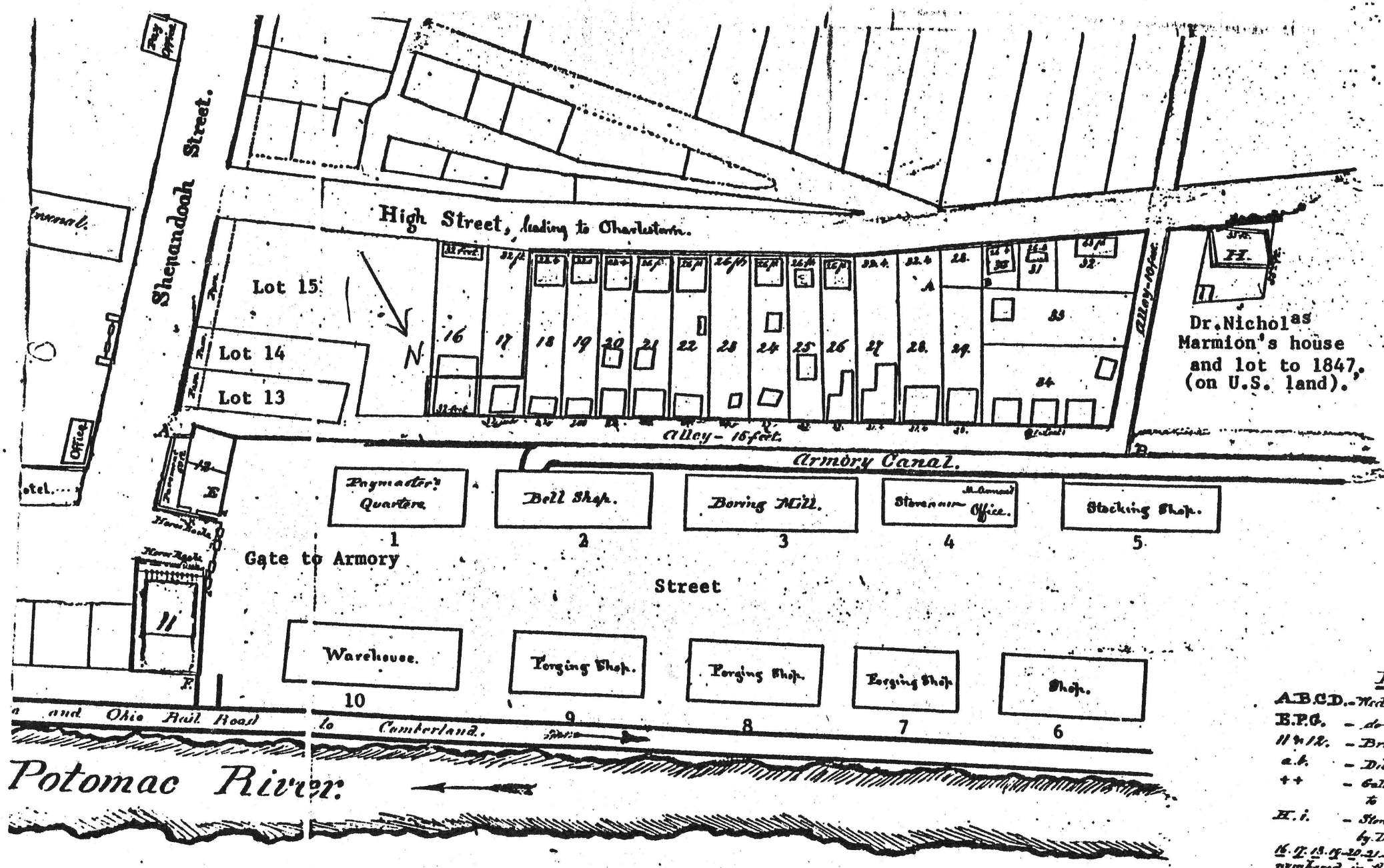
1. Paymaster's Quarters (Residence of the Superintendent 1808-09 to 1November 1844).

2. Bell Shop, erected 1809-10, water wheels and machinery. 131 by 45 feet, 2 story. brick.
3. Boring Mill, a new workshop erected in 1843-44 on the site of the 1799-1800 armory, Had water wheels and machinery. 122 by 42½ feet, 2 story brick.
4. Store House, also Master Armorer's Office. Old Smiths' shop erected in 1799-1800 but converted to use as a storehouse by 1821. No water wheels or machinery. 80 by 30 feet, 2 story brick.
5. Stocking House, erected in 1808-09, water wheels and machinery. 111 by 30 feet, 2 story, brick.
6. "Shop", Annealing Shop and Proof Shop, 1834. 125 by 45 feet, 1834.
7. Forging Shop., erected 1808-1809, 10 forges, 80 by 30 feet, 2 story brick.

8. Forging Shop, erected 1808-09, 16 forges, 120 by 30 feet, 2 story, brick.

9. Forging Shop, erected 1808-09, 16 forges, 130 by 30 feet, 2 story brick.

10. Warehouse, new, 1843-44, 93½ feet by 30 10/12 feet, 2 story, brick,for storing iron and steel,.



1844 MAP

[Copy]

MAP NO. 8

MAP OF HARPER"S FERRY, VA.,prepared in Compliance with Letter to Major(John) Symington, April 22,1848," Drawn by S. Howell Brown, Surveyor, in 1848. Scale 165 feet to the inch. Original linen map, only existing copy.

Harpers Ferry National Historical Park Map Collection, Map No. 77.

On this map of great historical value, Brown shows and names the U.S. Armory buildings in the Musket Factory, the U.S. Rifle Factory, and the U.S. Arsenal. Location of springs, pumps, stables, woodyards, firehouses, schools, and churches are also indicated. In 1851 Major John Symington revised and updated the section of the 1848 map relating to the Island of Virginius. These revisions were made in red ink on the linen map in 1851.

The dates of construction given after the names of buildings have been added by the writer. The number and name of each structure, however, was placed on the map by Brown in 1848.

SECTION OF THE MAP SHOWING THE U.S. MUSKET FACTORY BUILDINGS:

Structures marked "old" by Brown appear on Maps No 4 (1834), No. 5 and 6 (1837), and No. 7 (1844), and thus help to determine of the use of the unmarked buildings on the earlier maps.

In 1837-1839, the original width of the Musket Factory yard was increased by approximately 70 feet by building two great stone river walls north into the Potomac and then filling in behind them with earth and stone .

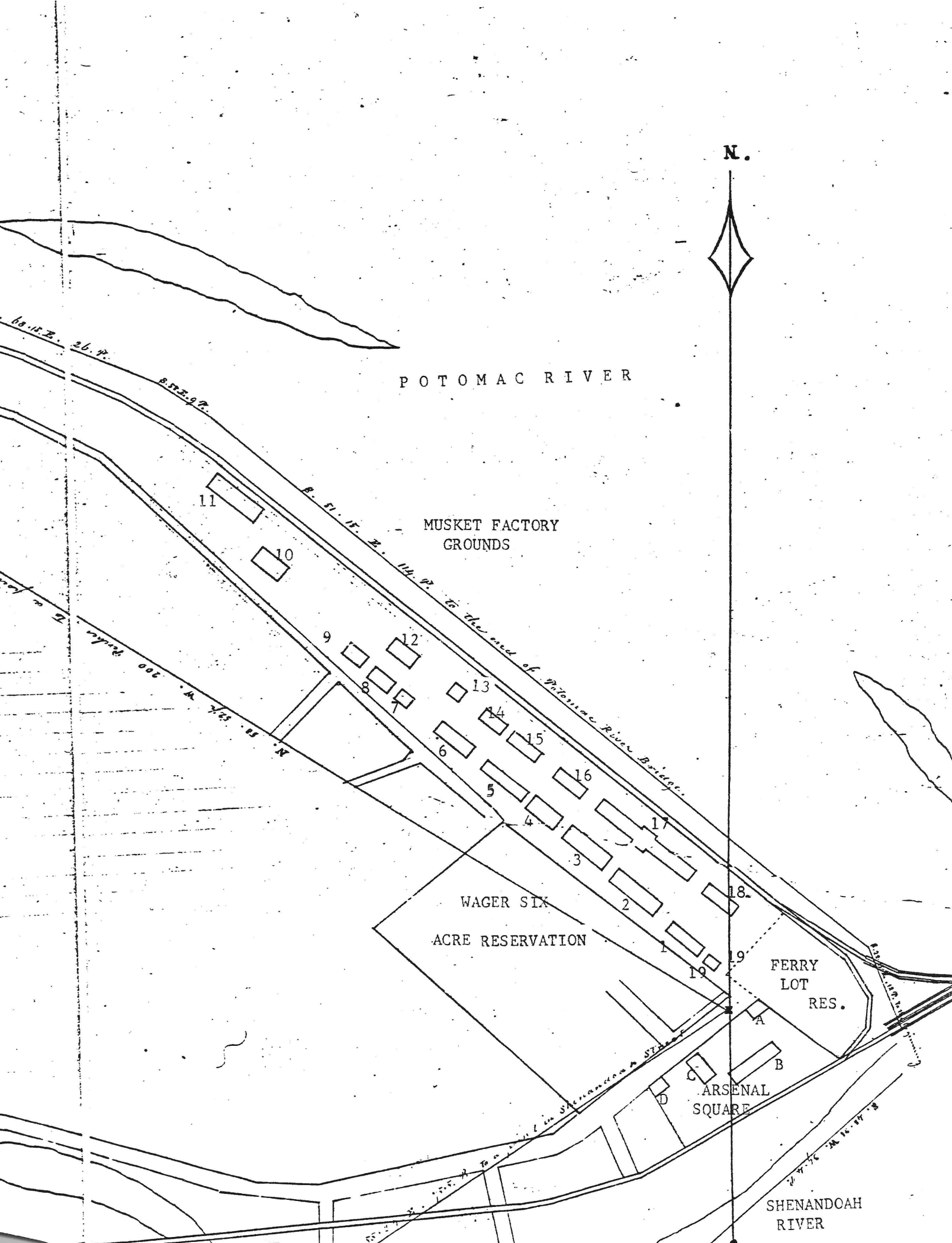
The line of old(1799-1810) of workshops situated along the north bank of the Armory canal and also the general level of the Musket Factory yard was very low and the grounds and floors frequently overflowed during river freshets. In the general rebuilding of the Factory that got underway in 1845, the new workshops had high stone foundations and the ground level was considerably elevated by much filling and grading.

LEGEND FOR S. HOWELL BROWN"S

MAP OF HARPER"S FERRY, 1848

U.S. MUSKET FACTORY BUILDINGS-1848:

1. Offices (1808-09,remodelled in 1847-48).
2. Bell or Finishing Shop (1809-10).
3. Boring Mill (1843-44).
4. Stocking Shop - New (1846-47).
5. Stocking Shop - Old (1808-09).
6. Stock Store House- New (1846-47).
7. Carpenters Shop - Old (1834).
8. Machine Shop - Old (1834).
9. Grinding Mill - Old (1831).
10. Coal Bin and Lumber House (1848-49).
11. Barrel Welding and Tilt Hammer Shop (1834-38).
12. Stock Store House-Old (1832).
13. Charcoal House - New (1845-46).
14. Proof House - New (1843-44).
15. Annealing Furnace - Old (1834).
16. Smiths Shop - Old (1808-09).
17. Smiths Shop - New (1845-48).
18. Warehouse -New (for iron and steel,1843-44).
19. Engine and Guard House- New (1847-48).


N.
POTOMAC RIVER
MUSKET FACTORY
GROUNDS
WAGER SIX
ACRE RESERVATION
FERRY
LOT
RES.
ARSENAL
SQUARE
SHENANDOAH
RIVER
1
2
3
4
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6
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14
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16
17
18
19
A
B
C
D

6. The River Wall for the Musket Factory, 1837-39:

The largest construction project at the Armory from 1836 to 1841 was the erection of a large river wall along the south bank of the Potomac at the Musket Factory.

In response to the request of the Ordnance Department, Congress appropriated on March 1, 1837, $ 40,628.00 for:

> Constructing new land on the north side of the north line of Musket Factory shops, 1,624 feet long and 50 feet wide, by building into the Potomac River 50 feet, erecting a great stone river wall and embanking or filling in with earth behind the river wall.....

The estimated cost of this large project were calculated as follows:

FOR THE NATIONAL ARMORY AT HARPER'S FERRY, VIRGINIA.

A.—For constructing a river wall in the range of the shops on the Potomac 1,624 feet long, 9 feet at base and 3 feet at top, extending from the upper corner of the tilt-hammer shop to a point on the river near Doring's brick house, containing 6,246 perches of stone wall, at $2 45 per perch.....	$15, 302 00
For making the embankment to the same, containing 37,832 cubic yards, at 50 cents per yard...	18, 916 00
For constructing 619 feet of stone arching over tail races, water-wheels, sluices, &c., containing 792 perches, at $5 per perch	3, 960 00
For constructing 1,238 feet of stone walling, for the support of arches, 3½ feet thick, 6 feet high, making 1,000 perches, at $2 45 per perch.....	2, 450 00

Col. George Bomford, Chief of Ordnance, explained the purpose of this project to Congress as follows:[1]

> A.—The construction of a river wall along the range of shops on the Potomac river is rendered highly desirable, in consequence of the confined state of the buildings;—hemmed in on one side by the river, and by high and precipitous ledges of rocks on the other. Besides, it will the means of reclaiming a space of fifty feet wide by sixteen hundred and twenty-four feet long, in the rear of the shops, and render it available for building purposes.

1. Special Estimate for additional appropriations for the Service of the Ordnance Department during the Year 1837, dated Jan. 21,1837-in Serial No. 303, Document No. 107, pp. 2-3. Appropriation in U.S. Statuesat Large, Vol. 5, p.149, "Doring's brick house" was the store and dwelling of Richard D. Doran, which was located on Wager Lot No.11 in the Wager Ferry Lot Reservation. See Map No. 7 (1844), page 183.

The contractor for this project was the mason John Littlejohn, who supervised the construction of the river wall from 1837 until his death, probably in June 1839. Littlejohn and his men went into action in the last half of June 1837. He was paid $ 13,972.26 for his work in 1837, $ 6,081.09 in 1838. and $ 1,710.26 for his construction in the second quarter of 1839.[2]

The Paymaster's vouchers indicated that Littlejohn accomplished the following construction prior to his death.

		River Wall		Embankment		Raceway Wall		
Year	Total Due	Perches	Cost	Cubic Yards	Cost	Perches	Cost	
1837	$13,972.26	3,400	$ 5,900.00	21,470	$ 6,450.00	500	$ 1,125.00	(3)
1838	6,081.09	1,821	3,186.75	2,000	600.00	Culverts 1,000	$ 3,000.00	(4)
1839	1,710.00	-	-	700	210.00	500	1,500.00	(5)
Total	$ 21,763.35	5,221	$ 9,086.75	24,170	$ 7,260.00	2,000	$5,625.00	

Comparing the perches of stone wall and cubic yards of embankment made by John Littlejohn and his men with the totals given for the project in the estimates(see page 186) suggests that 1,025 perches of stone river wall and 13,062 cubic yards of embankment yet remained to be constructed in June 1839. Littlejohn had completed perhaps two-thirds of the project.

2. Because Littlejohn's vouchers were suspended for some reason, his payments were delayed. Much of the work he did in 1837 was not paid for until 1838.

3. R.G. 217-file 1716- vouchers, 146D,147D, 148D, 149D for work in 3rd quarter of 1837-valued at $ 5,199.00; File No. 2364-vouchers 173 174, 175, 176, and 177, Abstract D, for work in 4th quarter of 1837. valued at $ 8,773.26, including a charge of $ 447.26 for use of 10 horses and seven carts on the project. Littlejohn's vouchers were suspended-not paid on time, but finally paid. Included in this work were making 1,320 perches of stone arches on the raceway; making 816 2/3 perches of stone wall to support the arches along the race way, making 3,500 cubic yards of embankment,apparently for these arches, and 1,208 perches 14 1/3 feet of river wall-see statement on Abstract D, File 2364 for $ 8,450.00 worth of work in 1837.

4. R.G. 217- 2729-Voucher 96C-August 31,1838 for $ 3,419.34-Abstract B.and File 3424-49E- Nov.30,1838, for $ 2661.75 to Littlejohn.

5. R.G. 217-3971-114-paid to Littlejohn's Administrator, filed June 24,1839.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

March 1,1837
Appropriated $ 40,628.00 in 1837.

POTOMAC RIVER WALL 1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 0	b 0	c 0	0 d	0	0
1837	e	f	g 8,783.64	h 1,125.00	9,908.64	
1838	i	j 7,325.00	k 3,419.34	l 2,661.75	13,406.09	
1839	m 3,652.50	n 383.25	o 1,710.00	p 10,089.78	15,835.53	1,477.74
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL					$ 39,150.26	

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716 Abstract D.
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878
s. 5252
t. 5624
u. 5785
v. 6195
w. 6465
x. 6718 -2nd series.

Contractor John Littlejohn submitted his bills for construction at the following annual rates:

$ 13,972.26 for construction completed in 1837.
6,081.09 " " " in 1838
1,710.00 " " " in 1839
$ 21,763.35 for work completed by Littlejohn.

He was paid at the above annual rate.

The Armory spent $ 17,386.91 for day labor and supplies to complete river wall in 1838-39.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

March 1,1837
Appropriated $ 47,284.00 in 1837

RIVER WALL AND COMPLETION OF THE TILT HAMMER SHOP 1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 0	b 0	c 4,916.74	d 0	4,916.74	2,198.26
1837	e 2,268.32	f 3,591.75	g 8,783.64	h 3,527.66	18,171.37	30,654.89
1838	i 228.27	j 8,738.64	k 3,419.00	l 2,661.75	15,047.66	15,835.53
1839	m 3,652.50	n 383.25	o 1,710.00	p 10,089.78	15,835.53	0
1840	q	r	s	t	0	0
1841	u	v	w	x	0	0
TOTAL					53,971.30	0

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092

i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878

Completion of Tilt Hammer shop- amount charged to materials during period June 30,1837 Dec.31,1837= $ 875.48.

$ 6,656.00 for Tilt Hammer Shop
$ 40,628.00 for River Wall

s. 5252
t. 5624
u. 5785
v. 6195
w. 6465
x. 6718

The Armory now decided to complete the remaining unbuilt third of the river wall and perhaps hired as day laborers, the master masons who had been working for the deceased Mr. Littlejohn. The Armory crew began work in October 1839 and completed the project by the 31st of December at a cost of $ 10,089.78.[6] Among the master masons employed on the Armory payroll at the rate of $ 2.00 per day, were Peter Litle(or Lytle), Edward Tearney, and Thomas Kirwan. Litle and Tearney were to form a partenership and become the chief stone masons during the reconstruction of the Armory in the 1840's and 50's. Kirwan and Tearney were to be active in Harper's Ferry after the Civil War.[7]

Total cost of constructing the river wall was probably about $ 40,000.00, as had been estimated.[8]

6 R.G. 217- File 4246-4th quarter of 1839. The cost of laboeer charged against the river wall account in October totalled $ 2,000.00. Thomas Mulligan was another master mason on this project.

7 Peter Litle and Edward Tearney were to erect one-half of Park Bldg. No. 44 in 1844. The remaining half of the structure,also built in 1844, was put up by Patrick H. Kelly, a carpenter employed on construction at the Armory.

8 The vouchers charged against this account by the Armory Paymaster,1837-1839, totalled $ 39,150.26, leaving a balance of $ 1,477.74 in the account. R.G. 217- 1716, 2092, 2364, 2729, 3434, 3703, 3695, 3917, and 4246.

7. The Baltimore and Ohio Railroad and the U.S. Musket Factory, 1838-41:

The Baltimore and Ohio Railroad completed its main line from Baltimore west to a point opposite to Harper's Ferry, on the Maryland shore of the Potomac River in December 1834. The company, however, found its way further westward along the north shore of the Potomac blocked by the C & O Canal Company. To proceed on to Cumberland, the railroad would have to cross the Potomac to the south or Virginia shore; in order to accomplish this the company had first to purchase from the Wager heirs the ferry rights to the Potomac; second, Virginia must pass a law which would permit them to enter and proceed westward through that State; third, they must construct a great railroad bridge over the river; and, fourth, they must obtain a right of way from the United States Government so that they could build their track through the U.S. Musket Factory yard to continue west up the south bank of the Potomac. All of this took time and about seven years passed before B & O RR line went beyond Harper's Ferry.

After the Armory's and Ordnance Department's experience with the operations of the Winchester and Potomac Railroad Company during the period 1836-38- as a constant fire hazard, the Chief of Ordnance and Superintendent of the Armory probably did not welcome the requests of the B & O for a right of way through the Musket Factory yard. Also the Armory had just spent $ 40,628.00 to erect a great stone river wall which gave them a new strip of land 1,624 feet long and 50 feet wide on the north side of the north line of factories. Now the railroad suggested that it would like to run its line (free of charge) over this new land. On November 5,1838, Secretary of War Joel R.

and Louis McLane, president of the B & O. RR, entered into an agreement that granted the railroad a right of way through the Musket Factory, but the Ordnance Department had incorporated provisions that were intended to protect the U.S. property and that required additional construction by the railroad company the probably came to at least $ 50,000.00.

This agreement stated in part;(See Railroad Maps No. 5 and 6,pp.181-82):

> The route (A and B) leaves the Railroad viaduct at or near second pier from the Virginia(south) shore and turns to the right up the Potomac until it acquires a direction parallel or nearly so to the new(Armory) river wall now being erected by the United States on the river side of the northern row of work shops belonging to the musket armory.
>
> The outside of this wall is about forty feet from the river front of said workshop and its top will when finished, be about fourteen or fifteen feet above low water in the river- the space between the wall and the shops being filled up and graded as a street. The route for the Railroad having reached the United States property at the lower or eastern end of the wall just mentioned passes up the river on the outside of that wall with a view to the construction of an additional wall in the river parallel to the United States wall and about twenty feet there from ; this additional wall to be built by the company of such a height as may be necessary to guard against danger from high water to the superstructure that may be placed upon that wall: the United States wall being also raised by the company to such a height as may be deemed necessary for the same purpose: the part so raised not extending inwards from the outer face of the wall at its top more than five feet: the space between the two walls to be left open throughout -- for the passage of the water of the river: the road to be so constructed opposite the(new) tilt hammer shop as to leave a clear space of twenty feet between the road and the river front of the shop. Should the construction of the road be found to make the tilt hammer shop inconveniently dark, the railroad company shall make such changes in the manner of lighting the building as the Secretary of War may require so as to put it into as good condition in this respect as it is in at present. The entrance of the water of the river into the space between the walls above mentioned and its excit(sic) therefrom to be provided for by proper openings in the outer wall. The route after passing the tilt hammer shop ascends the river along the outer bank of the United States canal by a solid embankment and wall: the embankment of the railroad to be supported on the river side by a new wall to be founded on the bed of the river, the said embankment covering the present bank of the canal so as to have the benefit of it; if desired, in diminishing the quantity of earth and other materials to be supplied for the formation of the road bed.

As actually constructed, the line was to follow Route B, which the agreement described thusly:

> Route B is identical with Route A to a point west of the tilt hammer shop, and east of the present cross wall (in the canal) where it diverges from route A into the river (north) for the purpose of obtaining a suitable curvature to cross the United States canal at or near the said cross wall as represented in the drawing (see "Map shewing the routes surveyed for the Balt. & Ohio Railroad along the public grounds on the Potomac at & above Harpers Ferry upon which the Company have applied to Government for permission to locate and construct their road," Scale 400 feet to one inch, Signed Benjamin Latrobe, Engineer of Location & Construction, B & O. RR. (1)) and then returning southwardly cross the route A and the (Armory) canal at or near the said cross wall to the hillside on the southern margin of the canal; the grade of the road being so elevated as to give a clear hight (sic) at lease twelve feet above the present of the water in the canal and over the county road as it shall be located along the inner margin of the canal. The railroad after so crossing the canal and country road pursues the hillside upwards to the head gates and thier (sic) falls into route A ....
>
> (Here -" The route passes along the two precipitous points of rocks immediately above the head gates and subsequently, pursues the Virginia shore of the Potomac towards Elk Branch without interference with the intended location of the county road.") [See Map No. 6, page 182).
>
> The superstructions for the support of the railway upon the parallel walls above described on route A to consist of wooden tressels (sic) or pillars of brick stone or iron, as the company may prefer: the posts or pillars to be placed at least fifteen feet apart from centre to centre lengthwise of the road, and to be not more than eighteen inches in diameter; the supports to stand in two parallel lines one upon the Government wall raised as above mentioned and the other upon the parallel wall built by the railroad Company....
>
> In the construction of the river wall below or east of the tilt hammer shop by said company, there shall be left sufficient openingsopposite each trail race from the water wheels of the armory to facilititate the discharge of the water therefrom and as auxiliary to the vent between the two parallel wall aforssaid.
>
> The water power privilege of the United States shall not be injured or obstructed, but passage shall be left for the water from the channel or the river near Striders warehouse above the public dam and at all other places and points specified and reserved between such warehouse and the falls immediately below the viaduct. .... 2 [See Map No.6,p.182).

(1) Original of Map in National Archives Record Group No. 121, Public Buildings Service Laminated map collection.
2. National Archives R.G. 121, Harpers Ferry Case No. 154.

Under this agreement, the B. &. O. Railroad Company constructed their great stone river wall at least twenty feet further(beyond the U.S. wall) into the river. Erected in 1840-42, the completion of this second wall increased the original width of the U.S. Musket Factory yard by some 60 feet to its present-day width. The locomotives of the B. and O. R.R. entered Harper's Ferry in June 1841. During the next year the wooden trestles were constructed on top of the two river walls and in June of 1842, the engines were able to run as far west at Hancock.

For a "newly identified" B. &. O. Railroad Company map showing conditions in the Harper's Ferry Musket Factory yard ca. 1837-40, see Map No. 9, p. 195. For the complete agreement text of the U.S. and Baltimore and Ohio Railroad Company of November 8, 1838, see Appendix No. 12.

MAP NO. 9

MAP AND PROFILE of a line surveyed for the
BALTIMORE AND OHIO RAILROAD Ascending the Potomac Along the
Tow Path of the Canal Belonging to the Government Works
HARPERS FERRY.

No scale and No date printed on map. Ca., 1837-40.

Signed in ink "Road Office B & O R.R. or W. N. Bolling,
Engineer, B. &. O. R.R.
Dated Oct. 24th 1840 or 1870 "

U.S. Department of Interior, National Park Service, Eastern Office of Design and Construction, Philadelphia, Pa. Map No. NM- HF- 9001.

This map is presented on page 260 of James P. Noffsinger's "Harpers Ferry, West Virginia, Contributions Towards a Physical History,"(November 1958), as showing conditions in Harpers Ferry on October 24, 1870(not 1840), "just after the flood of September 30,1870, which lasted two days and washed away the covered bridge belonging to the railroad." (The covered bridge belonging to the railroad had been blown up by the Confederates in June 1861).

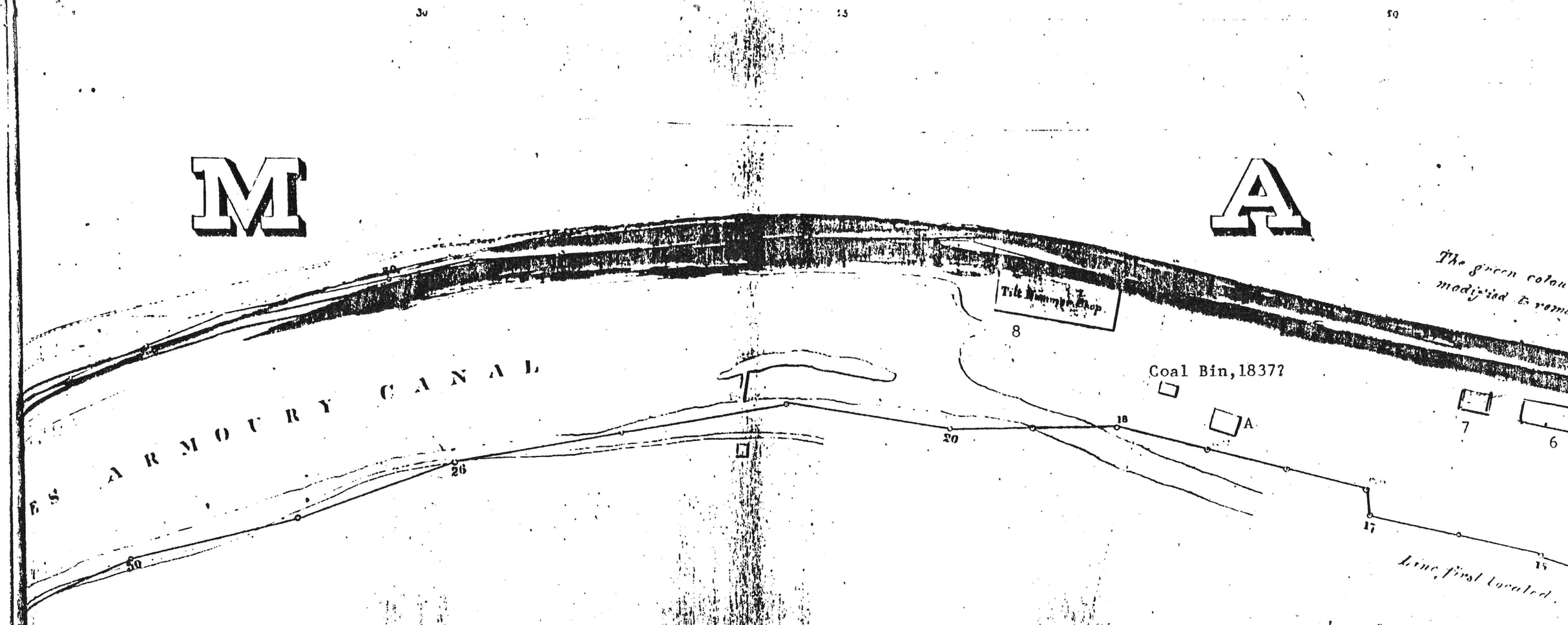
A comparison of Map No. 9 with Railroad Maps No. 5 and 6 (drawn in 1837-38) pages 181 and 182 ,reveals that Map 9 is a more detailed drawing showing the same problems relating to a right of way through the U.S. Musket Factory grounds.

The U.S. Musket Factory buildings, the Wager (covered) toll bridge, and the B.&. O. R.R. Potomac Bridge are identical on all three maps.

Assuming that October 24th 1840 is the correct date, then Map No. 9 would have been a detailed, accurate, and up to date map that would have been highly useful to the B.&.O. engineers who were constructing a stone river wall along the front of the Musket Factory to carried the main line west.

Assuming that October 24th, 1870 is the correct date, then Map No. 9 was useless and outdated, having no relation to existing conditions. Everyone of the U.S. Musket Factory buildings shown on Map No. 9 had been demolished by the Armory during the years 1842-1851 and these old shops had been replaced by new and much larger workshops. The new workshops were burned by the Confederates in June 1861, but the ruined brick and stone walls of most of these structures were still standing in 1870. None of these1842-51 buildings are shown on Map No. 9. There was also only one iron combination railroad- toll bridge over the Potomac in 1870 and this structure does not appear on Map No. 9.

For these reasons it is suggested that Map No. 9 was drawn ca. 1840 rather than 1870.



MAP AND PROFILE

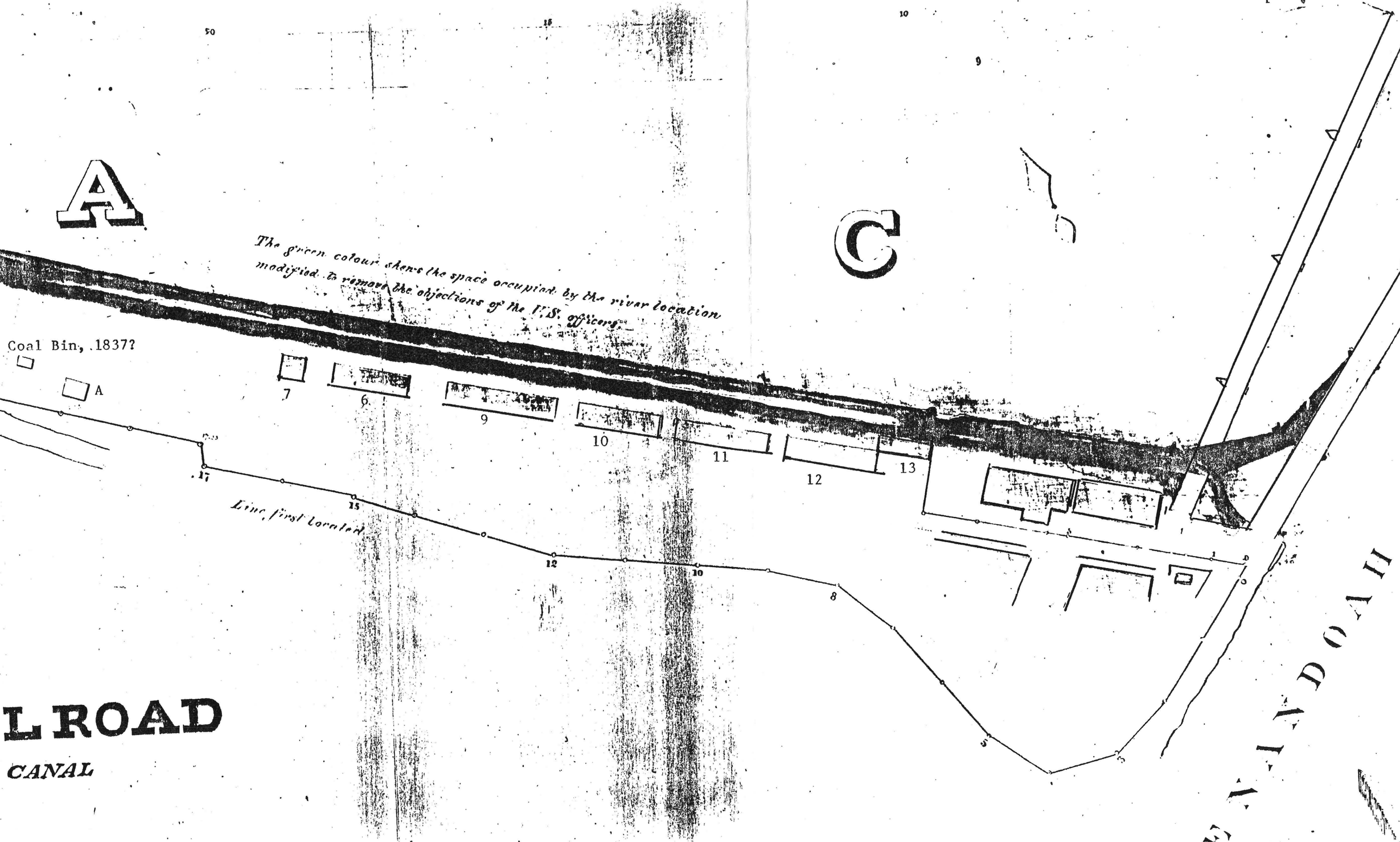
of a

line surveyed for the

BALTIMORE AND OHIO RAIL ROAD

ASCENDING THE POTOMAC ALONG THE TOW PATH OF THE CANAL

Belonging to the Government Works in


A
C
The green colour shews the space occupied by the river location modified to remove the objections of the U.S. officers
Coal Bin, 1837?
A
7
6
9
10
11
12
13
Line first located
L ROAD
CANAL

8. An Abortive Project-The Plan to Buy One Acre of Wager Family Lands, 1836:

At the request of the Ordnance Department, the Congress appropriated the sum of $ 5,000.00 on July 2,1836 " for the purchase of one acre of land adjoining the U.S. Musket Factory workshops and Armory Canal. (See Map No. 4(1834) p. 122 and Map No. 7(1844)p. 183).

Col. George Bomford, the Chief of Ordnance, advised Congress that the land was needed for the following reasons:

F. This item,—the purchase of Wager's lot; it is situated directly in the rear of the finishing and boring shops, master armorer's office, and store-room, upon the outer margin of the canal. The purchase of this lot is very important, as it respects the safety of the public armory, in consequence of slight wooden buildings being erected upon it, and occupied by persons regardless of the property of others: and these evils are constantly increasing.

The price asked for the ground appears to be high; but land at this place is very valuable, and possession of it is of much importance to the public works; and as it has been ascertained that it cannot be obtained for a less sum, the item is respectfully submitted.

1 /

Ironically, the money to make this acquisition, which the Armory and Ordnance Department had been attempting to buy for eight years, was received about six months too late; this delay proved fatal, and the property could not longer purchased for so low a sum.

In a letter dated April 13,1828, Superintendent James Stubblefield had first suggested the desirability of acquiring one-acre of Wager Six Acre Reservation land. He informed Bomford "The acre of land referred to, has been laid off and will stretch along the lower section of the Potomac Canal and immediately opposite the water(work) shops about 140 yards." 2 [See Map No. 7 1844)page 183 ,Wager Lots No. 16 to 3b.]

1. 1836 Estimates, Serial No. 288, Document No. 90, pp.7,8.

2 . Stubblefield to Bomford, April 13, 1828, Reel 22, V. 4, p.381-383.

Stubblefield argued that the land should be acquired for the following reasons: (1) It would permit the armory to tear down "several miserable tippling shops" erected on the northern line of the Wager Six Acre Resrvation very close to the workshops. These drinking shops operated detrimentally to both the morals and industrious habits of the Armory workmen. (2) The U.S.-Wager boundary line ran so close along the south side of the U.S. Potomac Canal that it was very difficult to make necessary repairs on the canal without tresspassing on Wager family property. (3) It was important that there should be an open area belonging to the armory on the south side of the canal to afford facilites for the operations of the Armory fire engine. (4). The frame tippling houses, were located within a few paces of the workshops and if these drinking places caught fire, they would greatly endanger the entire Musket Factory; (5) and finally, this acquisition would provide sufficient room to increase the width of the Potomal Canal and also to create a small turning basin and yard to remove lumber that had been moved down the canal.[3]

The Wager family were short of money at this time because they were still in the process of completing their toll bridge over the Potomac River. In a letter received at the Ordnance Department on April 21,1828, James B. Wager, acting on behalf of the Wager family, offered to sell one acre of land to Colonel Bomford for $ 5,000.[4] Bomford, however, informed Stubblefield that there was no possiblity of purchasing the land while "anything like the present price is asked for it.[5]

3.Reel 22,Vol. 4,pp. 381-383. Stubblefield to Bomford, April 13,1828.
4. Ibid.
5. Bomford to Stubblefield, May 7,1828-Reel 14, Vol. 6, pp.550-51.

Again on January 24, 1831, acting at the request of the Wagers, Captain John H. Hall wrote to Secretary of War John H. Eaton, urging the acquisition of this land for $ 5,000. Hall argued that the price asked was not exceptionally high in Harper's Ferry, and he pointed out that the value of the limited amount of privately owned land in town would increase even more in the future when the Baltimore and Ohio Railroad and the Chesapeake and Ohio Canal reached Harper's Ferry.[6]

As a result of this and other pressure, Col. Bomford reported to the Secretary of War on February 22, 1831, that as the Wagers had reduced their price from five to four thousand dollars, "... this Department therefore concurs in recommending the purchase, on the terms now proposed by the proprietors, in the full belief, that the land, which is very necessary to the advantageous operations of the armory, is fairly worth the price asked for it, and that it cannot at any future time be obtained on more reasonable terms."[7]

The special estimate for the Service of the Ordnance Department during the year 1829, submitted by Col. Bomford to Secretary Eaton on November 30,1829, thus requested the appropriation of $ 5,000.00 "for the purchase of one acre of ground adjoining the work-shop and canal." In his justification Bomford wrote:

> The additional ground proposed to be purchased at Harper's Ferry Armory.... A plat of it is annexed, an inspection of which will show its connexion with the works there, and the importance of its being possessed by the U. States. The price asked for this small tract is very high. But, as the possession of it is of much importance to the public works, and as it as been ascertained that it cannot be obtained a for less sum, the item is respectfully submitted.[8]

6. Hall to Eaton, Jan. 24,1831, Reel 22, Vol. 11,p.1021.

7. Bomford for Eaton Feb. 22, 1831, Reel 19, V. 13, pp. 1282=1283.
8. , Serial no. 195, Document no. 2, p. 129.

However, Congress in 1830 and again in 1831, refused to vote the money and there the question lay for another five years.

On February 13, 1835, Superintendent George Rust, Jr. wrote to Col. George Bomford and renewed the proposal that the Armory should purchase the same acre of land from the Wager heirs. Rust also justfied the plan with the same arguements that has been used by James Stubblefield in 1828.[9]

Lt. Col. George Talcott, Inspector of Armories and Arsenals, inspected the Harper's Ferry Armory during the summer of 1835 and on July 25, 1835, endorsed the land acquisition project, writing: "This is indispensible."[10] The item was thus included in the estimates for 1836 and Congress appropriated the money on July 2, 1836, but it was now a case of arriving too late.

James B. Wager had overextended his financial operations and, on July 7, 1834, he had been thrown into jail for debt, and was soon forced to declare bankruptcy. On April 2, 1835, the Circuit Court of Jefferson County, Virginia, appointed commissioners " to lay off and divide into three equal lots and parcels :"the Wager Six Acre Reservation and Ferry Lot among the three Wager family heirs, namely James B. Wager, Gerard B. Wager, and their sister, Sarah Ann Swayne, Fifty-six numbered lots were laid out and on October 10,1835. the Circuit Court offically divided these lots equally among the three heirs.[11] (See Map No.8,1844, p.183-for many of the lots). James B. Wager's lots were sold by order of the court at public auction in order to settle his large debts; thus after October 10, 1835, the Wager family, or three heirs, could no longer deliver the one acre of desired land to the Armory. Twelve small lots, with four buildings on them, were sold at public auction for the benefit of James B. Wager on June 18,1836 and brought in a total of $ 14,120.00. Four of his vacant lots, located on the north side of High Street, in the area which the Armory had planned to purchase, went at prices

ranging from $ 725.00 to $ 775.00 each! Unable to acquire the one acre of land for $ 5,000.00, this money should have reverted to the general surplus fund of the U.S. Treasury. The records of the Treasury Department, however, indicate that the Harper's Ferry Paymaster requisited this money and apparently spent it to make other permanent improvements at the Armory.[12]

Ironically, the Armory Superintendent John Symington was once again to revive this land acquisition project in 1844 and for the same reasons that had been advanced in 1828 and 1831. In this go-around, Symington was to be successful, but because the land had been subdivided and many houses and stores erected on these lots, the purchase in 1847-48 was to cost the the United States $ 38,932.33, or approximately eight time more than if the property had been acquired in 1828.

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9. Rust to Bomford, February 13,1835, Reel 12, V. 1, pp.98-99.

10. Summary Statement of Items in the Appropriation for Harper's Ferry Armory(for 1836) Recommended in the report of the Inspector of Armories and Arsenals, July 25,1835, HFNHP Photostat Collection, Vol. I, p. 47.

11. Deed Book 29, p.140, Jefferson County Courthouse, Charles Town, W.Va., with plat showing the 56 numbered lots, drawn by James M. Brown. James B. Wager owed more than $ 7,500 by 1833.

12. Serial No. 346, Document 104, p.3. This report shows that the $ 5,000.00 earmarked for the land purchase was withdrawn from the Treasury by the Paymaster in 1838 and no statement was made to indicate that it was ever return to the general surplus fund of the Treasury.

C. Repair and Improvements at the Musket Factory, 1840-41:

In the special estimates for 1838, the Ordinance Department requested $ 16,139.00 to make permanent improvements at the U.S. Armory and the rifle factory.[1] Congress refused to appropriate any money for this purpose but did provide, on July 7,1838, $ 20,000.00 to construct new machinery.[2]

The special estimate for the service of the Ordnance Department during the year 1839 requested the sum of $ 50,000.00 for permanent improvements at Harper's Ferry. Col. George Bomford explained the need for these funds writing:

> The strongest necessity exists for the improvement of the public buildings at Harper's Ferry Armory - they are at present exceedingly unsightly and unworthy of a National Establishment and many of them, being mere wooden sheds, are besides liable to accident from fire to which they are peculiary exposed by the passage of locomotive engines on a railroad through the public lands very near to the public buildings. The present estimate is proposed as the commence of a system of improvement which shall put the Armory on a footing suitable to its importance. Of the sum estimated for it is proposed to apply to the buildings & machinery of the
> musket armory $ 35,400
> of the rifle factory 14,600 $ 50,000.00.[3]

Congress again failed to appropriate funds for permanent improvements during the year 1839.

1. National Archives Record Group 156, Entry 129, Vol. I, p.211. $ 4,491 of the total was for work at the rifle factory: $ 991 to erect a new workshop and $ 500 to slate two roofs; the balance, $ 11,648 for work at the Armory
2. U.S. Statues at Large, V, p. 267.
3. National Archives, R.G. 156, entry 129, Vol. II, p.1, 6-7. HFNHP Reel 20, Vol. 6, pp. 622, 624-625.

From 1830 to December 31,1838, Congress had appropriated a grand total of $ 301,687.00 for making permanent improvements at the Harper's Ferry Armory. In the period 1837-39,the Armory Paymaster worked hard to expend all of these funds and to clear his books.During 1839 the last of these moneys was used up and only $ 2,962.08 reverted to the surplus fund of the U.S. Treasury [4]. No money would be available for repairs and improvements in 1840. (See Chart 36-page 204).

Accordingly Chief of Ordnance Bomford requested $ 50.000.00 in the special estimates for 1840 to make repairs and improvements at the National Armory at Harper's Ferry.

He imformed Congress: "No appropriation having been made on the estimate of last year for gradual imporvement of this establishment and the same necessity still existing it is proposed to apply to the construction of a forge, Grinding mill & other other structures at the musket factory: $ 35,400. At the rifle factory: 14,600.

$ 50,000" [5]

This time Congress acted on Bomford's request and, on July 20,1840, late in the construction season, appropriated $ 50,000.00 for repairs and improvements at the Harper's Ferry Armory. [6]

4. $ 137.06 in appropriations made in 1834 for completion of the machinery and $ 2,825.02 in apprppriation made in 1834 "for erecting storehouses" reverted to the Treasury Department in 1839. Serial No. 365,Document 107,p.3.

5. National Archives G.G. 156, Entry 1 29, Vol. II, p.9, 13-14; HFNHP Reel 20, Vol. 6, pp. 627,628-29.

6. U.S. Statues at Large, V, p.406.

APPROPRIATIONS FOR PERMANENT IMPROVEMENTS
AT HARPER'S FERRY ARMORY, VA., 1830-1835.

CASH FLOW FROM THE U.S. TREASURY DEPARTMENT TO THE ARMORY PAYMASTER AT HARPER'S FERRY, 1830-35

Year	Appropriated During the Year	Amount withdrawn by requestion from U.S. Treasury by Paymaster during year.	Balance in Treasury on Dec. 31.	
1830:	$ 29,000.00	$ 11,800.00	$ 17,200.00	(1)
1831	7,500.00	22,000.00	7,500.00	(2)
1832	0	7,500.00	0	(3)
1833	54,895.00	34,474.55	20,420.45	(4)
1834	50,083.00	44,698.72	25,804.73	(5)
1835	0	23,004.73	$ 2,800.00	(6)
Total:	$ 141,478.00	$ 143,478.00	-	

(1) Serial No. 209, Document 136, p.2.

(2) Serial No. 219, Document 134, p. 2.

(3) Serial No. 235, Document 128, p. 5.

(4) Serial No. 258, Document 390, pp.7-8.

(5) Serial No. 273, Document 112, p.5.

(6) Serial No. 288, Document 83, p.4.

CHART NO. 36B

CASH FLOW FOR PERMANENT IMPROVEMENTS FROM US. TREASURY DEPARTMENT TO THE PAYMASTER AT THE HARPER'S FERRY ARMORY, VA.

1836- 41

Year	Appropriated During Year	Amount withdrawn by requisition from U.S treasury during year.	December 31- Balance in Treasury	Remarks
1836	$ 77,897.00	$ 25,838.00	$ 52,059.00	** (1)
1837		47,059.00	5,000.00	(1836 funds) (2)
1837	8,569.00	8,569.00	0	Rifle Factory.
1837	53,743.00	53,243.00	500.00	River Wall, Trip Hammer Shop.
1837	62,312.00	$ 108,871.00	5,500.00	Total 1837
1838		5,000.00	0	(1836 funds (3)
1838		500.00	0	River wall, Trip Hammer Shop.
1838	20,000.00	20,000.00	20,000.00	New machinery-none used in 1838
1838	20,000.00	25,500.00	0	Total 1838
1839	+	19,774.25	225.75	New Machinery (4)
1840		225.74	0	New Machinery (5)
1840	50,000.00	8,000.00	42,000.00	Repairs & Improvemen
1840	50,000.00	8,225.74	42,000.00	Total 1840
1841		42,000.00	0	1840- R. & I. funds
1841	38,000.00	20,000.00	18,000.00	Repair & Improvement
1841	38,000.00	62,000.00	18,000.00	Total 1841(6)
Total	$ 248,209	$ 250,208.00		

1. Serial No. 303, Doc.119, p.3.
2. Serial No. 325. Doc. 92, p.3.
3. Serial No. 346, Doc. 104, p.3.
4. Serial No. 365, Doc. 107, p.3.
5. Serial No. 383, Doc. 74, p.3.
6. Serial No. 402, Doc. 62, p.3.

Form "Statements of the appropriations for the Serice of the War Department for the years 1836 to 1841, made pursuant to the provisions of the second section of the act of Congress of 1st May 1820, entitled "An Act in addition to the several acts for the establishment and regulation of the Treasury, War, and Navy Departments'" Extracts for the National Armory at Harper's Ferry, Va.,

+ $ 137.06 in funds for completion of new machinery, voted May 14, 1834, was turned into the U.S Treasury surplus fund in 1839.

** Balance in Treasury on Dec. 31, 1835 of earlier appropriations was $ 2,800.00.

In the Special estimate for 1841, Chief of Ordnance Bomford asked for $ 38,000.00 for repairs and improvements and new machinery at the Harper's Ferry Armory. "The public buildings," he explained," require extensive repairs" and "much new machinery for the improved method of fabricating arms of the model(musket) recently adopted" was also needed. [7]

Congress again consented and on March 3,1841 appropriated the requested $ 38,000.00 for repairs, improvements, and new machinery. [8]

During during the period July 20,1840 to December 31,1 841, a total of $ 88,000.00 in new funds thus became available to make repairs at the Harper's Ferry Armory; Chart 36B, page 204 indicates that the Armory Paymaster withdrew $ 70,000.00 from the Treasury in 1840-41, leaving only a balance of $18,000 available at the Treasury for use in 1842 . A question arises of how this money was utilized.

The Armory was now(1840) in serious fiscal difficulty; Congress had cut back on appropriations for the manufacture of arms during the late 1830's. Despite orders from the Ordnance Department to reduce his work force and cut costs, Armory Superintendent Edward Lucas,Jr. had failed to do so, but had continued to keep his large work force on the pay roll. On December 20,1838, the Ordnance Department had reminded Lucas that his "national armory fund was largely indebted (more than $ 46,000) to other appropriations, which had been used for the manufacture of arms, whilst there remained in the Treasury but $ 43,000 to meet this debt and all the expenses of the fourth quarter. He was told that it was absolutely necessary to make a gradual reduction in the operations of the armory and the number of people employed there." [9]

7. National Archives Record Group 156, Entry 129, Vol. 11,18, 23; nFNnP Reel 20, vol. 6, p. 631,633.

8. U.S. Statues at Large, Vol. V, p.434.

9. "Memorandum relative to operations at the National Armories, May 29,1841, by A. Mordcai, Captin of Ordnance, Ord. dept., in Serial No. 302, Document No. 1, p.52.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

IMPROVEMENTS & REPAIRS

Appropriated: $ 50,000.00 in 1840 and 38,000.00 in 1841.

1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a	b	c	d		
1837	e	f	g	h		
1838	i	j	k	l		
1839	m	n	o	p		
1840	q 0	r 0	s 0	t 8,000.00	8,000.00	42,000.00
1841	u 9,842.88	v 32,334.21	w 3,791.56	x 7,661.71	53,630.36	(1) $ 18,000.00
TOTAL					61,630.36	

2nd Series of 2nd Auditor's Accounts

$ 70,000 in hands of Paymaster, 1840-41.

t. 5624
u. 5785 Abstract C
v. 6195
w. 6465
x. 6718.

q.4429
r.4878
s.5252

(1) Balance in U,S. Treasury,Dec.31,1841.

	For Repair & Improvement Proper	OLD DEBTS- Actual Charges for Manufacturing Arms etc.	Total
4th Qr,1840	$ 300.00	$ 7,700.00	$ 8,000.00
1st Qr.1841	2,651.66	7,191.22	9,842.88
2nd Qr. 1841	6,348.99	25,985.22	32,334.21
3rd Qr. 1841	3,791.56	0	3,791.56
4th Qr. 1841	7,661.71	?	7,661.71
TOTALS:	$ 20,753.92	$ 40,876.44	$ 61,630.36

Lucas, however, did not move quickly enough to correct the situation and by February 13,1840"The outstanding debts of the armory, which there were no funds to meet, amounted to $ 30,351.77, besides the December and January rolls remaining unpaid, say $ 15,000 more."[10] On April 1,1841, it was reported that "After exhausting the appropriation of 1840, there remained due at the end of the the first quarter of 1841, $28,000, in addition to $ 33,000 required for paying the first quarter's rolls."[11]

In 1841 Edward Lucas,Jr (and also the civilian superintendent of the Springfield Armory in Massachusetts) were removed from office and replaced by Ordnance Officers of the U.S. Army.[12] Thus during the first three quarters of 1841 the sum of $ 48,887.17 was spent to pay for"Work performed prior to 30th September ,1840, payment for which was deferred till 1841."[13]

According to the Ordnance Departments annual reports to Congress $ 18,089.78 was expended at Harper's Ferry for repairs and improvements during the year October 1,1839 to Sept. 30, 1840 and $ 74,000.87 for similar purposes during the year ending Sept. 30,1841.[14] The records of the Harper's Ferry Paymaster for the fiscal year October 1,1839 to September 30,1840 indicate that the $ 18,000 was spent chiefly on repairs.[15] His vouchers for the year October 1. 1840 to September 30. 1841.

10. Ibid. In November 1838, the number of persons employed(exclusive of carpenters and laborers,employed chiefly on buildings and improvements), was 318. In 1839 the average number was 275, and in 1840 251,the reduction being made chiefly in the last quarter of that year.

11. Ibid.,

12. Annual Report of the Chief of Ordnance to the Secretary of War for year ending Sept. 30,1841, in Serial No. 395, Document 1, p. 103. See M.R. Smith, Harper's Ferry Armory,pp.259 -268 for further details on Lucas in1841.

13. Report of the Secretary of War to Congress for the year ending 30th Sept. , 1841, Serial No. 403, Document 157, p.2.
Springfield Armory's like debt was only $ 17,594.41

14. Serial No.378, Document 175,p. 2; Serial No.403, Document 157,p.2;

15. R.G. 217- Files 4246, 4429, 4878, and 5252.

however, reveals a considerably different picture of the use of funds than that presented in the 1840-41 report to Congress. Thus of the $ 9,842.88 said to be spent for repair and improvement in the 1st quarter of 1841, an examination of the abstracts reveals that $ 7,191.20 went to pay off old debts for the manufacture of arms and only $ 2,651.66 went to pay for services or material really related to repairs and improvements.[16] In the 4th quarter of 1840, $ 8,000.00 "for labor" in August and September had been charged against the repair and improvement account.[17] A note on the voucher for the 1st quarter of 1841 states that the Ordnance Department letter of March 22, 1841, granted the Paymaster the authority to charge these old debts to the R & I fund.[18]

Of the $ 32,334.21 on Abstract A, charged against R. and I in the 2nd quarter of 1841, approximately $ 6,348.99 was for proper R & I items and $ 25,985.22 for the production of arms old debts . Abstract D for the same quarter included $ 10,335.90 for "Repair and Improvement prior to March 4, 1841 , which also included large sums for the purchase of coal and cast iron.[19] The vouchers for the 3rd quarter of 1841, indicated the $ 3,791.56 spent, went for proper R.and I. projects.[20]

(See Chart No. 37, page 206).

In short, then, the cost overruns by Superintendent Lucas appear to have been considerably greater than the reported $ 48,887.17 and that

16. R.G. 217- File 5785, Abstract C, 1st quarter of 1841.
17. R.G. 2170 File 5624- Abstract B-. Only about $ 300.00 was apparently spent on proper R & I objects in this quarter.
18. R.G. 217- 5785-Abstract C.
19. R.G. 217- 6195
20. R.G. 217- 6465.

of the $74,000.87 said to be spent for Repair and Improvement in 1840-41 , perhaps as little as $ 12,792.21 went for such the projects, and the balance, $ 61,208.66 to pay off cost overuns on the manufacture of arms. Thus the debts left by Superintendent Edward Lucas, Jr. may have actually been closer to $ 110,000 than the offically reported $ 48,887.17.

In like vein the actual R. & I. project expenditures at the armory during 1841 and 1841 appears to have been about $ 31,000, a considerably more modest sum than the offically reported $ 92,000.

Work at the U.S. Musket Factory during the period 1840-41 was thus limited, with one exception, to repair of the structures. The one exception was the start that was made on the foundations of the first of a whole new generation of architecturally impressive shops that were to be constructed of brick and cut stone in the 1840's and 50"s. The first of these structure, a warehouse, was designed the new superintendent Major Henry K. Craig. Construction on the building got underway in the 4th quarter of 1841 and the mason George Mattingly was paid $ 1,833.82 on November 22,1841 for erecting the foundations.[21] (This is Bldg. No.10 on Map No. 7 ,page 183 and Bldg. No. 18 on Map No. 8 ,p. 184.

Repairs made at the U.S. Musket Factory in 1840-41 included the following projects:

1. To the mason John Lambaugh, Sept. 16, 1841, $ 42.00, for building brick wall front and back with 2,040 brick and laying 130 feet of brick

21. R.G. 217- file 6718-Voucher 84.
2nd Series.

cornice at the Superintendent's Quarters(Bldg. No. 1 on Map No. 5).[22] p.181.)

2. 3rd quarter,1841, the slater William Bayley received $ 317.20 for slating the roofs of the Superintendent's residence and of the musket factory buffing or polishing shop.[23]

3. The tinsmith Benjamin Snook was paid $ 63.99 for putting"spounting" on the Superintendent's quarters and workshops during the 4th quarter of 1841.[24]

4. In the 3rd and 4th quarters of 1839 , the forebay of the Bell Shop (Bldg. No. 2 on Maps 4,5,6,7,8.), had been rebuilt,apparently of stone and brick,by the masons Johnson Garrett and Peter Litle at a cost of $ 514.39.[25]

Total of repair, about $ 937.58.

William Bayley had also slated the roof of the Musket Factory Annealing Shop, 2,380 square feet of slate, for $ 238.00 in November 1838.[26]

22. R.G. 217-6465-V.59.
23. R.G. 217-6465-V. 79.
24. R.G. 217-6718-V.3.
25.R.G. 217- 3971- 5,7, 56, 66; File 4246-V. 11 and 15.
26.R.G. 217- 3424-V. 46B, dated Nov. 30,1838.

Summary, Musket Factory Buildings erected 1836 -41:

Buildings	Year	Cost	Remarks and Location
1. Shop for tempering Springs.	1836?		Funded in 1834, probably erected in 1836. Location in yard unknown. (1) Probably brick.
2. Shop for polishing barrels	1836?		Funded in 1834, probably erected in 1836. Location in yard unknown. (2) Probably brick.
3. Fire engine house	1836?		Funded in 1834, probably erected in 1836. Location in yard unknown. Probably frame structure.
4. Fire engine house	1836?		Funded in 1834. probably erected in 1836. Location in yard unknown. Probably frame structure.
Addition to Stocking Shop(Bldg. 5, Map. 4)	1836?	$ 1,821.45	Funded in 1834, probably erected in 1836. Stocking Shop is Bldg. No. 5 on Map No. 4(1834),p.122.
5.Tilt Hammer Shop for Barrel Welding	1834-1837	$ 9,250.46	Total cost, 1834-37: $ 22,750.46- Stone, one-story. Bldg 8 on Map 6(1837),p. 182; Bldg. 11,Map. 8(1848) p. 185. Bldg. No.
6 Coal House for Tilt Hammer Shop.	1837	650.00	Probably stone, 10 feet(one-story) high, 30 by 20 feet, located adjacent to new tilt hammer shop.
7.Store house for condemned parts of arms, scraps.	1837-38	3,400.00	Two stories, stone, 80 by 30 feet, slate roof. Perhaps Bldg. No. 11 on Map 5(1837)p. 181,
8. Forge for Scrap Iron	1838-1839?	5,000.00	Built of brick or stone with slate roof Location unknown. May perhaps be Bldg. No. 10 on Map No. 5, p.181; also see Map 9, p. 195.
Foundations of new Warehouse	1841	1,892.82	Foundation walls and embankments for a new brick and cut stone warehouse that was not to be completed until 1844. Bldg. No.10 on Map. No. 7 (1844)p. 183; Bldg. No. 18 on Map. 8(1848),p. 184.
Approximate Subtotal for Bldgs., 1836-41	8 Bldg	22,013.91	Construction of 8 buildings
Repair of Musket Factory Buildings:		7,299.62	For slating roofs, repairing walls, 3 new water wheels in Bell, Boring, and Stocking shops.Machinery
TOTAL Bldgs:		29,313.53	
New Well at Grinding Mill	1837	1,000.00	(Recorded cost-$ 731.41)located adjacent to Bldg. No. 9 on Map No. 8, p.185.

(1) R.G. 217,3rd Series, File 4403, Voucher 35, the mason William Collins was paid $ 70.93, for 12,230 brick in :"forge and furance tempering shop; File 9805. Voucher 23, August 31,1849, $ 2.75 to William Collins for repairing g furnance at tempering shop. 1 day work of mason at $ 2.00 and 3/4 day work of tender at $ 1.00. This suggests the shop was built of brick.

2.R.G. 217, 2nd Series File 6465, Voucher 79, 3rd quarter of 1841, to William Bayley, $ 317.20 for slating the roofs of Supt.'s quarters and of the buffing(or polishing) shop."

SUMMARY SHEET(Continued), Musket Factory, 1836- 41:

Construction Project	Year	Cost	Remarks
Stone River Wall	1837-1839	$ 40,628.00	Stone masonry wall 1,624 feet long, 14 to 15 feet high; 9 feet thick at base and 3 feet thick at top. With 37,832 cubic yards of earth embankment behind wall to create a new piece of land about 50 feet wide and 1,624 feet long. Recorded cost: $ 39,150.26
For new machinery at Musket Factory	1837-1839	$ 43,725.00	
GRAND TOTAL: 1836-41:	About	$ 114,666.53	About 8 new buildings completed.

No money was spent for the acquisition of land during the years 1836 to 1841.

The approximate rate of annual expenditures for construction from the funds appropriated during the period 1836 to 1841 are shown on Chart No. 38, which follows.

CHART NO. 38

National Archives Record Group No. 217- Records of the United States General Accounting Office, Washington, D.C. Records of Second Auditor: Reccords and Accounts from the Paymaster of the U.S. Armory at Harper's Ferry, Virginia, relating to expenditures for Permanent Improvements:

MUSKET FACTORY IMPROVEMENTS 1836- 1841

EXPENDITURES FROM NEW FUNDS APPROPRIATED 1836-1839:

YEAR	Repair of Potomac Canal	Store House for condemed Parts	Store House for Coal	Forge for scrap iron	New Machinery	Sinking Well at Grinding Mill	Purchase Wager Acre	River Wall Tilt Hamme Shop. (1)	Repair & Improvements	GRAND TOTAL 1836-39
1836	0	0	0	0	0	0	0	4,916.74	-	$ 4,916.74
1837	11,218.49		304.05	56.96	2,585.92	723.12	0	18,171.37	-	33,059.91
1838	404.69			382.03	5,086.56		0	15,047.66	-	20,920.94
1839				226.26	36,052.52		0	15,835.53	-	52,114.31
1840							0	0	8,000.00	
1841							0	0	53,630.36	
TOTAL:	11,623.18		304.05	665.25	43,725.00	723.12	0	53,971.30	61,630.36	$ 111,011.90
BALANCE LEFT:							(2) 5,000.00	0		
APPROP-RIATION	11,719.00	3,400.00	650.00	5,000.00	43,725.00	1,000.00	5,000.00	47,284.00	88,000.00	117,778.00

(1) Includes $ 1,844.59 in tilt hammer funds carried over from 1835; 6,656.00 appropriated for tilt hammer in 1837, and $ 40,628 provided for the river wall in 1837.

(2) $ 5,000.00 reverted to Treasury surplus fund.

CHART NO. 38

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YEAR	Repair of Potomac Canal	Store House for condemed Parts	Store House for Coal	Forge for scrap iron	New Machinery	Sinking Well at Grinding Mill	Purchase Wager Acre	River Wall Tilt Hamme Shop. (1)	Repair & Improvements	GRAND TOTAL 1836-39
1836	0	0	0	0	0	0	0	4,916.74	-	$ 4,916.74
1837	11,218.49		304.05	56.96	2,585.92	723.12	0	18,171.37	-	33,059.91
1838	404.69			382.03	5,086.56		0	15,047.66	-	20,920.94
1839				226.26	36,052.52		0	15,835.53	-	52,114.31
1840							0	0	8,000.00	
1841							0	0	53,630.36	
TOTAL:	11,623.18		304.05	665.25	43,725.00	723.12	0	53,971.30	61,630.36	$ 111,011.90
BALANCE LEFT:							(2) 5,000.00	0		
APPROP-RIATION	11,719.00	3,400.00	650.00	5,000.00	43,725.00	1,000.00	5,000.00	47,284.00	88,000.00	117.778.00

(1) Includes $ 1,844.59 in tilt hammer funds carried over from 1835; 6,656.00 appropriated for tilt hammer in 1837, and $ 40,628 provided for the river wall in 1837.

(2) $ 5,000.00 reverted to Treasury surplus fund.

CHART NO 39

STATEMENT OF THE ACCOUNT OF EACH APPROPRIATION APPLICABLE TO THE SERVICE
OF THE ORDNANCE DEPARTMENT DURING THE YEARS ENDING SEPTEMBER 30th, 1838 TO Sept.30,1840
OCTOBER 1, 1837 to SEPTEMBER 30, 1840
Submitted by Col. George Bomford and Lt. Col. George Talcott.

the Secretary of War.	1837	1838				1839				TOTAL
PROPRIATIOM	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	
Special Armory Account	10,634.84	1,016.51	2.234.78	4,819.01	6,808.94	2,033.55	351.02	525.81	0	$28,424.43
Rifle Factory	2,313.61	483.22	432.91	118.84	0	0.	0	0	0 (Bal	3,348.58
River Walls, Tilt Shop.	(4) 12,244.66	288.27	8,450.00	4,125.00	2,661.75	3,652.50	2,093.25	0	10,089.78	43,605.26
Completion of Machinery	1,318.19	134.73	9.74	1,223.15	838.59	0	0	0	0	3,524.39
New Machinery	0	0	0	0	3,917.48	4,379.75	7,387.99	12,386.26	11,898.52	39,970.00
Erecting Storehouses	0	0	0	0	1,750.00	0	0	0	0	1,750.00
Repairs & Improvements	-	-	-	-	-	-	-	-	-	
TOTALS:	26,511.27	1,922.73	11,127.43	10,286.00	15,976.76	10,065.80	9,832.26	12,912.07	21,988.30	$ 120,622.66
Annual Total	26,511.27	$ 39,312.92				$ 54,802.43				

Grand Total: $ 120,622,62 .

Sources:

1. Serial No. 344, Document 2, pp.392-395, 4th qr. 1837 to 3rd qr., 1838.
2. Serial No. 363, Document 2, pp. 90-93, 4th qr,.1838 to 3rd quarter, 1839.
3. Serial No. 375, Document No. 1, pp.74-75, 4th qr. 1839-4th quarter,1840.

(4)-R.G. 217- 2nd series, 2092-4th quarter-1837- $ 12,244.66 for

Constructing River wall	$ 3,984.97
Making embankments	3,351.00
Constructing stone arches	1,125.00
Constructingstone walls	56.96
Complete tilt shop	2,024.20
Making Canal Water tight	1,702.53
Total	$ 12,244.66.

CHART NO 40

Statement of Disbursements by the Harper's Ferry Paymaster for Permanent Improvements at the National Armory, 1836-39

Special Approp.	1836	1st-3rdQrs 1837	4th Q 1837	1838	1839	TOTAL
Completion of Machinery in 3 shops	4,563.29		1,318.19	2,206.21	0	8,087.69
For new improved machinery	575.49		0	3,917.48	36,056.52	40,549.49
Tilt Hammer Shop	2,453.49		0	0	0	2,453.49
Rifle Factory drill shop	854.03		0	0	0	854.03
Purchase of private dwell-in houses	3,298.00	0	0	0		3,298.00
River walls, trip hammer shop	0		12,244.66	15,525.02	15,835.53	43,605.21
Special Armory Account	6,736.25		10,634.81	14,879.24	2,910.38	35,160.68
Special Rifle Factory Account	0		2,313.61	1,034.97	0	3,348.58
For 3 new water wheels	301.52					301.52
Erecting Storehouses	0		0	1,750.00	0	1,750.00
TOTAL $	18,782.07		26,511.27	39,312.92	54,802.43	139,408.69

SOURCES:

(1) Serial No. 304, Document 186, p.3- for 1836

(2) Serial No. 344, Document No. ,pp.392-395, 4th quarte 1837 to 3rd qr., 1838.

(3) Serial No. 363, Document No. 2, 90-93, 4th qr. 1838 to 3rd qr.1839.

(4) Serial No. 375, Document No. 1, pp.74-75, 4th qr,1839-3rd qr.1840.

From Annual Reports of the Chief of Ordnance to the Secretary of War and to Congress for 1836 to 1840.

D. Potomac Canal, 1836-41:

Lt. Col. George Talcott, Inspector of Armories and Arsenals, inspected Harper's Ferry Armory in July 1835 and on the 25th of that month offered the following comments on Superintendent Rust's proposed program to improve the U.S. Potomac Canal: "The embankment of the new raceway or canal, constructed at great expense, appears to be failing and no time should be lost in taking measures for its preservation.....

The entrance to the Canal is very much choaked with timber brought down to market and passed through the lock into the Canal. The rocks also appear throughout the channel and prevent the free passage of the water to the headgates, With all these impediments the supply was so abundant on the 25th July, that the gates were kept nearly closed, although the water was low in the river. When the tilt-hammer works are in full operation more water will be required , but if the entrance to the Canal should be cleared out in advance of the gates no fear is entertained of any deficiency of water." [1]

Talcott upped Superintendent Rust's orginal estimate of $ 3,460.40 [2] to accomplish this work to $ 5,260.00.

Colonel George Bomford, Chief of Ordnance, accordingly requested and Congress appropriated the following item on July 2,1836: [3]

1. For repairs of canal or raceway, and altering it..... $ 5,260.00

The Chief of Ordnance explained to Congress that this money would be used:

B. For repairs to canal, raising embankments, flagging the pathway on it, cleaning out and walling the lower end, and cleaning obstructions above the head gates, all of which are indispensable. [3]

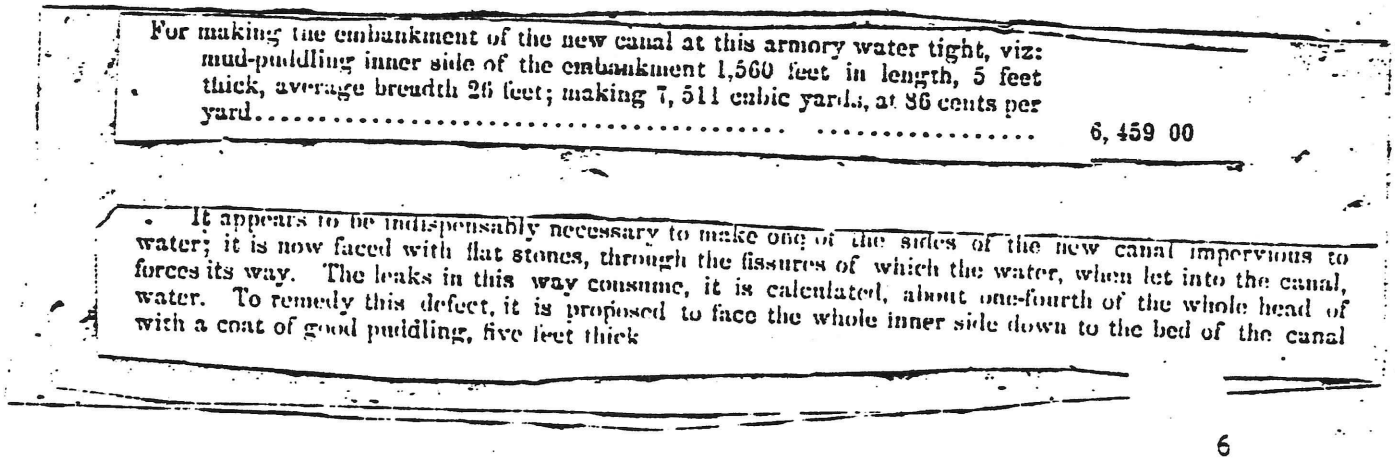
1. Remarks upon the Items in the Estimates for Harper's Ferry Armory for the Year 1836, as prepared by the Inspector General and the Superintendent, July 25,1835, National Archives R.G. 156, Special Five box 28, dFNHP Photostat Collection, Vol. L. p. 46. p.50-Inspection Report,17th-July,1835.

2. Ibid., p. 48, 49. Rust calculated $ 944 to raise the embankment to the Canal; $ 591 for raising embankment and flagging pathway of canal; $ 1,263 to erect a stone wall along part of canal, and $ 666.40 to clear out the lower end of the canal.

3. Special Estimate for additional appropriations for the service of the Ordnance Department for the Year 1836, January 11,1836, in Serial No. 283, Document No. 90,pp.7-8.

Because over half of the building season had passed before money became available, little or no work was done on the canal project in 1836. George W. Rogers was employed as an engineer on the Armory Canal project in 1836.[4] Perhaps because of Rogers' calcuations, the Ordnance Department requested and Congress provided on March 1,1837 the additional sum of $ 6,459.00 "for constructing embankments of the new canal," thus making a grand total of $ 11,719.00 available to repair the canal in 1837-38.[5]

The 1837 estimates explained to Congress in detail how the money would be used and also why this work had to be done as follows:



For making the embankment of the new canal at this armory water tight, viz: mud-puddling inner side of the embankment 1,560 feet in length, 5 feet thick, average breadth 26 feet; making 7, 511 cubic yards, at 86 cents per yard..... 6, 459 00

It appears to be indispensably necessary to make one of the sides of the new canal impervious to water; it is now faced with flat stones, through the fissures of which the water, when let into the canal, forces its way. The leaks in this way consume, it is calculated, about one-fourth of the whole head of water. To remedy this defect, it is proposed to face the whole inner side down to the bed of the canal with a coat of good puddling, five feet thick

[6]

The records of the Armory Paymaster reveal that work on the canal repair project got underway in the second quarter of 1837 and was substantially completed by December 31,1837 and completed during the first quarter of 1838. The total cost was $ 11,623.18; of this sum

4. R.G. 217- 2nd series, 20761- 1st Quarter 1836-paid $ 200.00 for his services as engineer on the Armory Canal.
5. Special estimate for additional appropriations for the service of the Ordnance Department for the year 1837, dated Jan. 21,1837; Serial No. 303, Document No. 107, pp. 2, 304. Appropriation in U.S. Statues at Large,V.,p.149.
6. Serial No. 303, Doc. 107, p. 2, 3-4.

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

REPAIR OF POTOMAC CANAL

Appropriated 1836- 5,260.00
appropriated 1837- 6,459.00
11,719.00

1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a	b	c	d		
1837	e	f 5,993.98i	g 170.98	h 5,053.53	11,218.49	
1838	i 404.69	j	k	l	404.69	
1839	m	n	o	p		
1840	q	r	s	t		
1841	u	v	w	x		
TOTAL					11,623.18	

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434

Amount of account charged to materials from June 30 to Dec. 31,1837= $ 869.17.

$ 11,218.49 was expended in 1837 and $ 404.69 in 1838.[7]

Of the total, $ 4,044.76 went to make the canal water tight, $ 7,002.75 for making new embankments, and $ 575.67 for other costs.[8] In December 1837 $ 44.50 was spent to purchase 44½ gallons of whiskey "for use of the hands while at work in the water during the fall while puddling in the new canal."[9]

In July 1839 the site of the old saw mill, which Superintendent James Stubblefield had constructed along the Potomac Canal in the fall of 1819 at a cost of $ 472.75, was "filled up" at a cost of $ 11.00.[10]

In December 1840 John McCartney excavated and removed 10,000 cubic yards of earth and rock from the middle of the armory canal for $ 100.00. A note on his voucher explained that "This was the bank of the old canal, removed while the water was out of the canal, it being the old canal embankment."[11]

Finally, in August 1841, George Mattlingly received $ 365.20 "for erecting 265 perches 15 feet of stone dry wall. This was a superstructure of stone on the river wall opposite the public dam on the Potomac, extending about 460 feet, but with a view to the better preservation of the dam

7, R.G. 217- 1423, 1716, 2092, and 2364. Also 2094.
8. Ibid. About $ 869.17 was charged for materials.
9. R.G. 217- 2094- 120A, dated Dec. 14,1837. David Lowny, on November 4,1837, was paid $ 126.00 for quarrying and delivering 180 perches of stone for the repair of the canal(2094-Voucher 4th quarter 1837). With this $ 170.50 included, the appropriations for work on the canal would have just about been exhausted.
10. R.G. 217- 3971-6- To Edward Morgan, July 17,1839, $ 11.00 for 11 days work filling up site of old saw mill.
11. R.G. 217- 6465. The voucher dated Dec.30,1840, was not paid to Sept. 4, 1841. The total bill was $ 100.00 but deduction charged against McCartney of $ 32.75 reduced the actual payment to $ 67.25.

" and canal, and to facilitate the entrance of boats with public property into the inlet [of the Armory Canal]."[12]

Total expenditures for the repair and improvement of the U.S. Armory Canal on the Potomac from 1836 to 1841 appear to have amounted to approximately $ 12,099.38.

Expenditures for Repairs and Improvements on U.S. Armory Canal 1836 to 1841:

Year	Potomac Canal
1836	0
1837	$ 11,218.49
1838	404.69
1839	11.00
1840	100.00
1841	365.20
Total:	$ 12,099.38

With the $ 38,982.59 spent building walls and embankments and widening the Potomac Canal from 1828 to 1835 included, the grand total cost of rebuilding the Armory Canal from 1828 to 1838 came to $ 51,081.97. The total amount of money spent on the U.S. Musket Factory Canal from 1817 to 1841 exceeded $ 55, 024.82.

12. R.G. 217-6465-Voucher 108, dated Aug. 30,1841

E. Repairs to the U.S. Potomac Dam, 1836-41:

During the period 1836-41, a total of approximately $ 793.66 was spent in making minor repairs to the U.S. Armory Dam on the Potomac. These were funds that had been carried foreward from the 1833 appropriations. The money was spent as follows: $ 88.00 during the first quarter of 1837[1] and $ 705.66 during the 3rd quarter of 1838. The latter amount was paid to John Littlejohn, the contractor who was also building the great Armory river wall along the Potomac, on August 31,1838.[2]

For Maps showing how the U.S. Potomac Dam and Canal appeared in 1837-38, see Map No. 6 page 182.

Expenditures for Repairs and Improvements on U.S. Armory Dam

1836 to 1841:

Year	Potomac Dam
1836	0
1837	$ 88.00
1838	705.66
1839	0
1840	0
1841	0
Total:	$ 793.66

Expenditures on the Potomac Dam from 1817 to 1841 totalled approximately $ 20,162.92.

1. National Archives Record Group 217, Records of 2nd Auditor, 2nd Series, File 951, Abstract G.

2. R.G. 217, 2nd Series, File 2729, Voucher No. 96C.

CHART NO. 42

National Archives
Record Group No. 217, Records of the United States General Accounting Office, Washington, D.C. Records of the Second Aduitor:
from Paymaster of the U.S. Armory at Harper's Ferry, Virginia, Expenditures for Permanent Improvements

REPAIR OF THE POTOMAC DAM — Money carried foreward from 1833.

1836- 1841

Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL	Dec.31 Balance:
1836	a 0	b 0	c 0	d 0	0	793.66
1837	e 88.00	f 0	g 0	h 0	88.00	705.66
1838	i 0	j 0	k 705.66	l 0	705.66	0
1839	m	n	o	p	0	0
1840	q	r	s	t	0	0
1841	u	v	w	x	0	0
TOTAL					793.66	0

a. 20761 - 1st series
b. 20654 " "
c. 677 2nd Series
d. 761 " "
e. 951 -Abstract G.
f. 1423
g. 1716
h. 2092
i. 2364
j. 2364
k. 2729
l. 3434
m. 3703
n. 3695
o. 3917
p. 4246
q. 4429
r. 4878
s. 5252
t. 5624
u. 5785
v. 6195
w. 6465
x. 6718

EXPENDITURES AT THE U.S. MUSKET FACTORY, BUILDINGS, CANAL, AND DAMS, 1836 - 1841

YEAR	MACHINERY, BUILDINGS	CANAL	DAM	APPROXIMATE GRAND TOTAL	TOTAL FOR ARMORY
1836	8,924.62			8,924.62	28,678.42
1837	35,958.60	11,218.49	88.00	47,265.09	81,679.27
1838	24,979.98	404.69	705.66	26,090.33	55,541.11
1839	52,864.23	11.00		52,875.23	10,925.72
1840	300.00*	100.00		400.00	18,089.78
1841	20,453.92*	365.20		20,819.12	74,002.87
TOTAL:	143,481.35	$ 12,099.38	$ 793.66	$ 156,474.39	$ 268,917.17

* Estimated. 1840-41-includes Rifle Factory, Arsenal, dwellings, as well as Musket Factory.

Musket Factory Funds Available, 1836-41

Total of Old Funds carried forward from 1835..... $ 19,169.00

Amount of above reverting to Treasury Surplus fund in 1839..... 2,962.08

Balance of Old Funds expended, 1836-39..... 16,206.92

Total of new funds appropriated 1836-39 ..... 117,778.00

$ 134,994.92

Amount of above(land fund) reverting to Treasury 5,000.00

Balance probably spent 1836-39..... $ 129,994.92

Estimated amount spent 1840- 41..... 5,000.00

Estimated total expenditures,Musket Factory buildings, canal, and dam, 1836 - 1841..... $ 134,994.92.

CHAPTER IX

SUMMARY AND CONCLUSIONS, THE MUSKET FACTORY, 1798 - 1841

The U.S. Armory at Harper's Ferry, Virginia, spent a grand total of approximately $ 830,393.31 from 1798 to December 31,1841 for the construction and repair of buildings, canals, dams, bridges, roads, and streets. An additional expenditure had been made during the same years to purchase 1,890 acres of land; with land included, the total amount spent on the Armory's physical plant stood at $ 875,870.59 on December 31, 1841. (See Chart No.43, p. 225).

From 1798 to 1841 the Armory constructed a grand total of about 266 buildings, which included workshops, store houses, powder magazines, offices, stables, and dwelling houses, for Armory use. These structures were erected at the following sites:

	No. of buildings	
1. U.S. Musket Factory, along the Potomac:	about	53
2. U.S. Arsenal Square, Shenandoah Street	"	9
3. U.S. or Hall Rifle Factory, Lower Hall Island in the Shenandoah River	"	28
4. Armory stables, powder magazines	"	7
5. Armory dwelling houses	"	169
Grand Total built, 1798 - 1841, about:		266

U.S. MUSKET FACTORY:

The U.S. Musket Factory at Harper's Ferry, located on the south bank of the Potomac River, was the chief arms producing plant of the Harper's Ferry Armory from 1798 to 1861. After spenting a total of $ 44,938.56 from 1798 to December 31,1801, to construct the U.S. Musket Factory shops, its canal, and dam, the plant began the production of arms during the summer of 1801.

CHART NO. 43

Expenditures, by periods, for Land, New Construction, and Repairs of Buildings, Canals, and Dams at the U.S. Armory at Harper's Ferry, Virginia, 1796 - 1841:

Periods:	For Land	New Construction	Repairs	Construction & Repair Total	Total Land, Repair, Construction	No. of Buildings
1796- 1801	$ 17,016.66	$ 43,704.06	$ 1,234.50	$ 44,938.56	$ 61,955.22	ca. 30
1802- 1807	-	37,332.15	11,410.68	48,742.83	48,742.83	
1808-1813	20,860.62	122,797.85	16,346.92	139,144.77	169,005.39	36
1814-1821	5,000.00	52,675.35	37,763.12	90,438.47	95,438.47	113
1822-1829*	-	75,109.36	10,130.67	85,240.03	85,240.67	180
Expenditures: 1830-1831:	-	$ 32,549.01	$ 120.25	$ 32,669.26	$ 32,669.26	
Sub Total- 1796-1831:	$ 42,877.28	$ 364,167.78	$ 77,006.14	$ 441,173.92	$ 484,051.20	
1830-1835:	2,600.00			152,971.48	155,571.48	ca. 208
1836-1841:	-			$ 268,917.17	$ 268,917.17	ca. 215
TOTAL- 1796-1841:	$ 45,477.28			$ 830,393.31	$ 875,870.59	

1.886 acres of land. 1818-1841.

427 acres acquired in 1796-97
1,395 5/8 acres acquired in 1813, with timber cutting rights.
68 acres and ferry lot acquired in 1818, also ferry rights on Shenandoah.

About 258 buildings erected 1798-1841.

1,890 acres acquired, 1796-1841.
-4 acres for Harpers Cemetery, 1803.
1886 acres, 1841. 1833 also acquired water-power rights on Shenandoah.

The original(1801) Musket Factory plant was comprised of five buildings: three brick workshops and two store houses, the later built of wood or stone. The brick shops included "the Armory or Factory", 2½ stories, with four wooden water wheels that turned the machinery used for boring, grinding and polishing arms. The second floor held the work benches of the filers and stockers, while the third floor was used to store lumber, tools, and stocks. The second brick water shop, the "Forge or Mill," was probably one-story, and it held one-eight foot breast type wooden water wheel that worked the tilt hammer for heavy forging. The third brick shop, two-stories,had no water-powered machinery. Known as "the Smiths" or Forging Shop, this structure held 10 forges for the use of the smiths on the first floor and second floor served as a workshop for filers. The other two buildings consisted of a store house for coal and a proof house. The latter structure was used for the testing of muskets.

Because of wars in Europe and the threat of wars with Great Britain and France, the United States Government spent a total of $ 139,144.77 from 1808 to 1813 enlarging the physical plant of the U.S. Armory at Harper's Ferry in an effort to double the production of arms. The number of brick workshops was increased from three in 1801 to 10 by 1810 and the number shops with water-powered machinery from two in 1801 to six by 1810.

In 1810, eight of the 10 brick shops and four of the six water shops stood in the U.S. Musket Factory yard along the Potomac.[1] The number of large brick Smiths or Forging Shops was similarly increased from one in 1801 to four by 1810 and the number of available forges in these structure from 10 in 1801 to 46 by 1810. In 1810, then, a total of 11 structures stood in the Musket Factory yard consisting of four brick smiths shops, four brick water shops, one wooden carpenter shop, one wooden lumber room, and the Superintendent's

1.Two of the new brick structurees, which also contained water wheels, were built on the Lower Hall Island in the Shenandoah River in 1808-10.

two-story brick residence, the dwelling house having been erected in 1808-09. The original (1798-1801) plant had been designed and constructed by Paymaster John Mackey. The 1808-10 additions were designed by Superintendent James Stubblefield and erected by Paymaster Samuel Annin.

The basic ground plan of the yard, which the Musket Factory was to retain until the destruction of its plant in 1861, was established during the enlargement of the arms plant in 1808-10. During the expansion program, the original(1800) single line of workshops that stood on the north bank of the Musket Factory or Potomac Canal was extended both to the east and west by erecting new buildings at the lower(eastern) and upper(western) ends of the first plant. In addition, a second line of large brick workshops was erected on the south bank of the Potomac River, paralleling the original southern line of factories that stood on the bank of the canal. The new northern line of 1808-10 buildings did not contain water wheels or water-powered machinery. Within the north and south rows, the large new brick structures were arranged symmetically, so that workshops of about equal length in each line stood approximately opposite to each other. The two line of brick shops were separated by a central street, known as "Potomac Street," which was about 70 feet wide and ran from the Wager Ferry lot Reservation at the lower(eastern) end of the yard to the upper(or western) end of the Musket Factory grounds.

Between 1801 and December 31, 1813, the National Armory at Harper's Ferry manufactured a grand total of 61,257 small arms. Between 1812 and 1814, as a part of the war effort, Harpers Ferry shipped out 29,500 weapons to the army. These included 27,500 flintlock muskets, 1,000 flintlock rifles, 500 carbines, and 500 flint lock pistols.

Following the War of 1812, the number of forges at the Musket Factory was reduced from 46 to 36 when the first Smiths Shop, erected in 1799, was converted into a store house and office for the Master Armorer

On December 31, 1821, the U.S. Musket Factory was comprised of a total of 15 structures(not including the Superintendent's 1808-09) house) that were valued at $ 70,150. Seven large brick two-story brick workshops, valued at $ 67,000, stood in two lines: four structures in the southern line on the north bank of the canal and three factories in the northern line, on south bank of the Potomac. Two of the large brick shops dated from 1799-1800 ("the Factory and Smiths Shop", and the other five had been erected in 1808-10. The remaining eight smaller structures were valued at $ 3,150 and were comprised of a draw grinding shop, a proof house, store house for stone coal, tempering shop, store house for iron, store house for charcoal, an office for the superintendent, and fire engine house. Six were built of wood and two of wood and stone; all were one-story, except for the two story office and two-story engine house.

TOTAL V. Do Not Film PLANT IN 1821 AND 1831.:

Value of Plant in 1821	ARMORY		RIFLE FACTORY	
ARMORY		1831	1821	1831
Number of buildings		180	2	15
Value of Buildings		$ 217,920.74	$ 4,130.14	$ 31,215.30
Value of Canals,dams	$ 105,000.00	$ 145,117.68	0	$ 4,599.50
Value of Plant:	$ 255,650.00	$ 363,038.42	$ 4,130.14	$ 35,814.80
Value of Machinery	$ 72,247.44	$ $ 77,554.43	$ 11,917.03	$ 149,410.89
Value of Land,1.890 acres	$ 42,877.28	$ 42,877.28	0	0
TOTAL:	$ 370,774.72	$ 405,915.70	$ 16,047.17	$ 185,225.69

Following the War of 1812, the number of forges at the Musket Factory was reduced from 46 to 36 when the first Smiths Shop, erected in 1799, was converted into a store house and office for the Master Armorer

On December 31, 1821, the U.S. Musket Factory was comprised of a total of 15 structures(not including the Superintendent's 1808-09) house) that were valued at $ 70,150. Eight large brick two-story brick workshops, valued at $ 67,000, stood in two lines: four structures in the southern line on the north bank of the canal and three factories in the northern line, on south bank of the Potomac. Two of the large brick shops dated from 1799-1800 ("the Factory and Smiths Shop", and the other five had been erected in 1808-10. The remaining eight smaller structures were valued at $ 3,150 and were comprised of a draw grinding shop, a proof house, store house for stone coal, tempering shop, store house for iron, store house for charcoal, an office for the superintendent, and fire engine house. Six were built of wood and two of wood and stone; all were one-story, except for the two story office and two-story engine house.

TOTAL VALUE OF THE ARMORY PLANT IN 1821 AND 1831 :

Value of Plant in 1821 and 1831	ARMORY		RIFLE FACTORY	
ARMORY	1821	1831	1821	1831
Number of buildings	113	180	2	15
Value of Buildings	$ 150.650.00	$ 217,920.74	$ 4,130.14	$ 31,215.30
Value of Canals, dams	$ 105,000.00	$ 145,117.68	0	$ 4,599.50
Value of Plant:	$ 255,650.00	$ 363,038.42	$ 4,130.14	$ 35,814.80
Value of Machinery	$ 72,247.44	$ $ 77,554.43	$ 11,917.03	$ 149,410.89
Value of Land, 1.890 acres	$ 42,877.28	$ 42,877.28	0	0
TOTAL:	$ 370,774.72	$ 405,915.70	$ 16,047.17	$ 185,225.69

The Superintendent's residence, valued at $ 3,000.00. stood at the head of the eastern or lower end of the southern row of four large brick workshops. The Armory sawmill, valued at $ 1,000, was located somewhere along the bank of the Musket Factory Canal. In addition, there were also two other structures standing in the Musket Factory yard that were not included in the 1821 inventory of buildings. These were a brick puddling furnace that had been constructed in 1818 at a cost of $ 130.00 and a brick annealing furnace erected on the bank of the Potomac River prior to 1819 at an estimated cost of $ 130.00. The total number of structures standing in the Musket Factory yard in 1821 was thus 18 (not 15) workshops, storehouses, and furnaces, valued at approximately $ 71,410.00. With the Superintendent's residence included, the grand total of edifices in the yard was 19 and the value about $ 74,410.00

Originally all of the roofs of the Armory buildings were covered with wood shingles, but starting in April 1825, a program of recovering the roofs of the arsenals and chief workshops with slate was instituted. About $ 1,989.00 was expended on this program between 1825 and 1829 and $ 3,013.42 from 1830 to 1835 for work on Musket Factory buildings. After 1830 the new shops erected had slate roofs as a matter of course to reduce the danger from fire.

The Musket Factory suffered major damage from fire at 2 a.m. on May 8, 1824, when a fire swept the finishing shop, the largest Armory shop(131 by 45 feet) and destroyed the roof, woodwork and machinery. The brick walls only, were left standing. The structure was reconstructed at a cost of $ 10,000.00 in 1824-25; this included $ 5,000 for work on the structure and $ 5,000.00 for building new machinery. Its roof was slated and in March 1825 a cupola or belfry was added to the roof. The shop was henceforth known as 'the Bell Shop."

Development of Musket Factory, 1822 - 1841

From 1822 through 1841, the National Armory at Harper's Ferry, Virginia, spent a grand total of $ 509,729.32 for the construction and repair of buildings, river walls, wells, canals, and dams at the U.S. Musket Factory, U.S. Rifle Factory, U. S. Arsenal, on Armory dwelling houses, and for the purchase of land.(See Chart 43, p. 225). Of this sum approximately $ 275,085.97 was expended at the U.S. Musket Factory as follows: For Musket Factory buildings, river walls, wells, roads or streets about $ 209, 457.61; on the enlargement, improvement and repair of the Musket Factory canal, approximately $ 54,522.96; and for the extension and repair of the U.S. Potomac dam, 1822-41, $ 11,105.40.[1] (See Chart No. 44, p. 231).

Of the approximate $ 209,457.61 expended on the Musket Factory buildings and grounds from 1822 to 1841, about $ 58, 401.17 went to erect 26 new structures, $ 56,613. 14 for repair of buildings(including $ 5,002.42 for slating roofs), $ 40,772.30 for the construction of a great stone river wall 1,624 feet long and about 15 feet high, and some $ 53,671.00 for making and purchasing new machinery. (See Chart No. 45, page 232).

The nine new Musket Factory buildings erected 1822- 1829 at a cost of approximately $ 8,541.23 were comprised of the following structures:

1. Shop for Turning and Tempering Locks, built in 1822 of stone at a cost of approximately $ 150.00.
2. Shop for Annealing Gun Barrels, built of stone in 1823, cost about $ 200.00.
3. Shop for Draw Grinding, built in 1826 of stone, cost about $ 481.42, A two-story buildingm 18 by 27 feet in size.

1. The total spent on the Potomac Dam from 1820 to 1841 was $ 23,305.40, as the dam was rebuilt in 1820-21 at a cost of $ 11,200.00.

APPROXIMATE TOTAL OF EXPENDITURES ON U.S. MUSKET FACTORY BUILDINGS AND GROUNDS, CANAL, AND DAM, 1822 - 1841:

Bldgs. in 1821: 19 Estimated Value: $ 74,410.

Estimated Value of canal and dam, 1821: 105,000

Total Estimated Value, Musket Factory Plant in 1821..... $ 179,410.

PERIOD	Bldgs, River Walls, Wells	Armory Canal	Armory Dam	Total- Musket Factory
1817-21		1,345.20	11,200.00	
1822-29	26,309.73	8,454.08	6,105.01	$ 40,868.82
1830-35	63,046.00	33,969.50	4,206.73	101.222.23
1836-41	120,101.88	12,099.38	793.66	132.994.92
Total- 1822-41 $	209,457.61	54,522.96	11,105.40	$ 275,085.97

CHART NO. 45

SUMMARY CHART: APPROXIMATE TOTAL OF EXPENDITURES AT U.S. MUSKET FACTORY, 1822 -1841, For Construction and Repair of Buildings, for Construction of new Machinery, River Walls, and Wells.

Period	For New Buildings	Repair of Buildings	For Slating	for River Walls	For New Machinery	Total Expenditures	No. of Bldgs Erected
1822-29	8,541.23	5,689.20	1,989.00	144.30	9,946.00	$ 26,309.73	9
1830-35	27,846.03	32,186.55	3,013.42			63,046.00	10
1836-41	22,013.91	13,734.97		40,628.00	43,725.00	120,101.88	7
Total:	$ 58,401.17	51,610.72	5,002.42	40,772.30	53,671.00	$ 209,457.61	26

Workshops, Store Houses, Offices and Furnaces at Musket Factory, December 31,1821 = 18. Estimated Value: $ 70,583.
Superintendent's House..... 1 " " 3,000
Total, 1821, in Musket Factory Yard: 19 buildings $ 73,583.

	1801	1810	1821	1831	1841
No. of workshops, storehouses,	5	10	18	28	24
Superintendent's Residence	1	1	1	1	1
Total:	6	11	19	29	25

4. Store House for Coal, erected in 1826 at cost of $ 202.35, Built of stone.

5. Shop for Annealing, Case Hardening and Tempering Ramrods, built in 1826 at a cost of $ 111.00. Constructed of stone.

6. Shop for the Half Stocking Machinery, erected in 1827 at a total cost of $ 2,800. $ 1,200.00 for the structure and $ 1,600.00 for making the new machinery. A two-story brick shop, 20 by 30 feet.

7. Watch House of stone, erected in 1828 at a cost of $ 200.00. Probably used by night watch men.

8. Store House for Charcoal, constructed of wood in 1828 at a cost of $ 750.00. Must have been a large building.

9. Proof and Engine House, Brass Foundry, built of stone in 1829 at an approximate cost of $ 1,500.00.

Also built in 1822 at a total cost of $ 250.00 were four small wooden sheds, three over three principal water wheels so that stoves could be kept to keep the wheels from freezing, and the fourth shed over an annealing furnace.

As has been mentioned, the large workshop, or Bell Shop, damaged by fire in 1824, was reconstructed in 1824-25 at a cost of $ 10,000.00: $ 5,000 for the structure and $ 5,000 for making new machinery.

Tilt Hammer Shop Site, 1828-1832: From 1828 to 1832 a grand total of about $ 5,513.60 was spent constructing stone foundation walls and embankments on the north bank of the Musket Factory canal for a proposed new tilt hammer shop. In 1834 it was decided to erect the shop at a new site and the old location was abandoned.[2]

Bldgs. No. 3, 4, 8, and 9 appear to be replacement structures for four like buildings that were standing in 1821. The total number of buildings standing in the Musket Factory yard in 1829, including the Superintendent's residence, was thus probably about 24 at the most.

2. Spent on tilt hammer shop site: $ 3,496.46 from 1828 to 1829; perhaps $ 2,017.14 from 1830 to 1832.

From 1830 to 1835 the Armory spent about $ 27,846.03 constructing 10 new workshops and store houses at the Musket Factory. These consisted of the following structures:

1. A small building attached to the finishing or Bell Shop, erected in 1830 at a cost of $ 152.00. Apparently intended to house grindstones and their machinery.
2. A small house to store scrap iron, built in 1830 at a cost of $ 43.32.
3. Hardening Furnace, constructed in 1831 at a cost of $ 57.51.
4. Grinding Mill, built in 1831 at a cost of $ 2,438.45. Stone foundations and walls, slate roof. Cast iron water wheel and machinery installed (apparently) in 1834 at cost of $ 2,980.00. Total cost of building and machinery, 1831-34, about $ 5,480.00. The Grinding Mill is Bldg. No. 9 on Map No. 8 (1848), page 185.
5. Store House for Stocks, erected in 1832-33 at an approximate cost of $ 800.00. Probably built of stone, 65 by 30 feet, the new stock house replaced "a decayed" "house in in which the Musket Stocks are now deposited." This is Bldg. No. 12 on Map No. 8(1848),p. 185.
6. Tilt Hammer Shop for Barrel Welding(Forging Shop, Trip Hammer).

Construction started 1834-35 at a new or second site, $ 13,500.00½ expended on construction during this period. Large stone shop, stone foundations and walls, one story, with slate roof, one wooden water wheel 20 feet in diameter, and five cast iron reacting water wheels. Structure perhaps 2/3rds complete by 1835. This is Bldg. No. 11 on Map No. 8(1848), p.185. Also see Maps No. 6(1837), p. 182, and No. 9, p. 195). Tilt shop was not to be completed until the end of 1837. Final total cost, 1834-37, of building and machinery about $ 22,750.46. This was the one large factory building to be erected at the Musket Factory between 1810 and 1841.

7. Store House for Iron, Steel and Bin for Coal, erected in 1834 at an approximate cost of $ 1,710.15. Stone foundations, brick walls, probably two story. This may be either Bldg. No. 10 or 11 on Map No. 4(1834),p. 122 or Bldg. No. 11 or AA on Map No. 5 (1837), p. 181. This building did not replace a similar Musket Factory store house(but one that had been utilized by the Musket Factory on the Lower Hall Island).

8. Carpenters Shop, built 1834-35, stone one-story building with slate roof. Bldg. No. 7 on Map No. 8(1848), p. 185.

9. Machine Shop, built 1834-35, one-story stone building with slate roof. Bldg. No. 8 on Map No. 8 (1848), page 185.

The Carpenter and Machine Shops were constructed at a total approximate cost of $ 4,230.69 in 1834-35. They replaced one old "Carpenters and Machine Shop."

10. Annealing Shop and Proof House, built in 1834-35 at an approximate cost of $ 1,872.36. Stone building with slate roof, probably one story. The new building replaced an old "annealing shop and proof house"

The new shop is Bldg. No. 6 on Map No. 4 (1834), page 122, and Bldg. No. 15 on Map No. 8 (1848), p. 185.

On September 15,1832, the whod shingle roof of one of the three old Smiths or Forging shops at the Musket Factory caught fire. The roof and interior woodwork were destroyed but the brick walls and tools were saved. This shop was reconstructed in 1832-33. In 1832-33 $ 849.95 was spent to repair the brick walls of four old Musket Factory shops and 3,013.42 to slate their roofs. From 1833 to 1838 a total of $ 34,440.47 was expended to construct three new water wheels and new machinery for the old turning(Bell) shop, boring mill, and stocking shop at the Musket Factory(See Bldgs. No.2, 3, and 5 on Map No. 4(1834) page 122, also Map 6(1837), page 182), and Map. 7(1844)p. 183. The turning and stocking shops dated from 1808-10 and the boring mill from 1799-1800. The rebuilt Smiths shop had been erected in 1808-10.

During the years 1836 to 1841 the Armory spent a total of about $ 22,013.91 to erect and complete seven new structures, finish up work on the 1834 tilt hammer shop, and start the foundations of a new warehouse,. Built were the following workshops and store houses:

1. Shop for tempering springs, probably built in 1836 and perhaps constructed of brick.
2. Shop for Polishing Barrels, probably erected in 1836 and perhaps built of brick
3. Fire Engine House, perhaps constructed in 1836. Probably a frame structure.
4. Fire Engine House, perhaps erected in 1836 and probably built of wood.

Addition to Stocking Shop, Bldg. No. 5 on Map. No. 4, p.122.

Total probable cost of Bldgs. No. 1 to 4 and addition- $ 1,821.45. The money for these five above projects was provided in 1834 but the work was not carried out until 1836.

Completion of the Tilt Hammer Shop for Barrel Welding. Construction on this one-story large water shop with slate roof had gotten underway in 1834-35. An additional $ 9,250.46 was spent in 1836-37 to complete the building and make its machinery. Total cost of construction, 1834-37, was about $ 22,750.46. The tilt shop is Bldg. No. 11 on Map No. 8(1848),page 185. Also see Map No. 6 (1837), page 182 and Map. No. 9(1837), p. 195.

5. Coal Store House for Tilt Hammer Shop , built in 1837 at a cost of $ 650.00. one-story(10 feet) high, 30 by 20 feet, probably built of stone. Coal House located adjacent to Tilt Hammer Shop, Bldg. No. 11 on Map No. 8 (1848),p. 185.
6. Store House for Condemned Part of Arms, Scraps, &c. Erected 1837-38 at a cost of approximately $ 3,400.00. A two-story stone building with slate roof, 80 by 30 feet. Perhaps Bldg. No. 11 on Map No. 5(1837), p. 181.

7. Forge for Scrap Iron , perhaps built in 1838-39, probable cost if built $ 5,000.00. To be built of brick or stone, with a slate roof. This may perhaps be Bldg. No. 10 on Map No. 5(1837), page 181.

Under construction last quarter of 1841, stone foundations and embankments for a new Warehouse . Cost of construction was $ 1,892.82 in 1841. Building was not to be completed until 1844. The warehouse is Bldg. No. 10 on Map No. 7 (1844), page 183, and Bldg. No. 18 on Map No. 8(1848), page 184.

In 1841 the maxinium number of workshops and store houses standing in the Musket Factory year, including the Superintendent's House, would have been about 25.

In his Special estimates to Congress for the year 1839, Col. George Bomford, Chief of Ordnance , wrote of the "public buildings at Harper's Ferry Armory", "they are at present exceedingly unslightly and unworthy of a National Establishment, and many of them, being mere wooden sheds, are besides liable to accident from fire..."

During the period 1836 to 1841 about $ 7,299.62 was also spent to repair and slate the roofs of the old Musket Factory buildings. In 1837 a well had been sunk adjacent to the grinding mill at a cost of $ 1,000.00 to provide drinking water for the workmen. The grinding mill, erected in 1831, is Bldg. No. 9, on Map No. 8, page 185. During this same era, $ 43,725.00 was also expended to construct or purchase new machinery for use in the Musket Factory workshops.

The major construction project of the 1836-41 years was the erection of a large stone river wall from a point opposite to Wager Ferry Lot No. 11 westward up the south bank of the Potomac River for 1,624 feet (See Map No. 7(1844), p.183, for location of Lot No. 11), at a cost of about $ 40,628.00 in 1837-39. The wall was constructed in the river about 50 feet north of the northern line of Musket Factory shops. The space behind(south) of the new wall was to be filled in with 37,832 cubic yards of earth to form a new piece of land 50 feet wide and 1,624 feet long on the north side of the northern line of workshops.

The stone mortar masonry wall itself, containing 6,246 perches of stone wall, was to be 1,624 feet long, 14 to 15 feet high, nine feet thick at the base and three feet thick at the top. The wall also contained stone arches and walling over the various tail races, water wheels, and sluices that led from the Musket Factory canal into the Potomac River. This great wall was completed in 1839.

On November 5, 1838, the United States Government granted the Baltimore and Ohio Railroad Company a right of way up(west) the Potomac River by passing outside or north of the Armory 1837-39 river wall. The railroad company was required to construct a stone river wall that paralleled the Armory wall at a distance of about 20 feet. The space between the two walls was left open for the free passage of river water and the railroad wall was to contain suffice openings opposite each Musket Factory tail race of the water wheels to facilitate the discharge of that water into the river. When the right of way reached a point opposite to the 1834-37 tilt hammer shop for welding barrels the railroad agreed to leave a clear space of twenty feet between the road and the river front of that shop.

The agreement further specified that the railroad track was to be carried westward across the north side of the Musket Factory on trestles that could be built of wood, brick, stone , or iron. The legs of the trestle were to be at least 15 feet apart from east to west and the legs to be no more than 18 inches in diameter. One set of legs of the trestle were to rest on top of the Armory's new stone river wall and the other set on the paralleling stone river wall that the railroad company was to built.

In 1837-38, the Baltimore and Ohio Railroad company had succeeded in getting a bridge, of sorts, across the Potomac River at Harpers Ferry. In 1839

Virginia passed a law authorizing the B. &. O. railroad to cross into that State at Harpers Ferry and also requiring the line to run westward through Virginia to Cumberland, Maryland. On November 5, 1839, the railroad company secured rights of way along the river front from the owners of Wager Lots 9 and 7 (which stood below-east of Wager Lot 11-see Map No. 7(1844),p. 183).

In December 1839, the B.&. O. Railroad purchased the bridge and ferry rights across the Potomac River at Harper's Ferry from the Wager family heirs for $ 15,000.00. In April 1840 the company also purchased the bridge or abutment lot from the Wager family for an additional $ 1,800.

In December 1839 the Baltimore and Ohio Railroad company let contracts for work on the "1st section, 1st Residency, 1st Division, Baltimore and Ohio Rail Road, west of Harpers Ferry." This section was slightly more than a mile and one-half in length and extended from the railroad viaduct at Harpers Ferry, upwards along the Virginia shore of the Potomac to a point a little above the U.S. Musket Factory dam on the Potomac. The contracts called for :"bridge masonry and wooden superstructure trestle work, dry walling, excavation, and embankment."[1]

The railroad company constructed its paralleling stone wall and wood trestle across the face of the Musket Factory in 1840 -1841. In June 1842 the main line was opened from Harpers Ferry to Hancock and in November 1842, the line reached Cumberland, Md.[2]

The wooden trestles of the railroad were replaced by iron trestles in 1855. With the completion of the railroad wall, the U.S. Musket Factory reached its present width in 1841.

1. Virginia Free Press, November 28, 1839, p. 2, c.2.
2. Snell, Charles, W., "Historic Building Site Survey Report for Wager Lot No.1 & the Bridge Lot, The Baltimore & Ohio Railroad Company's Bridge and Buildings at Harpers Ferry,1835-1862, Harpers Ferry National Monument,West Virginia ." (N.P.S. typescript, Harpers Ferry NM, W. Va., September 22,1958) pp. 11-24.

Fate of the Buildings of the 1798-1841 Musket Factory:

Of the approximate 53 buildings erected in the U.S. Musket Factory yard between 1798 and 1841, about 25 were standing in 1841. Of the 25 1841-edifices, only two, the Superintendent's Quarters, built in 1808-09, and the Finishing, Turning, or Bell Shop, constructed in 1809-10, were still standing in 1861. All other pre-1841 workshops and storehouses at the Musket Factory were to be demolished by the Armory during the years 1843 1851 in order to clear their sites for the construction of a new generation of large, well-built and architecturally impressive replacement structures comprised of brick and cut-stone. The" rebirth" ofthe physical plant of the U.S. Musket Factory, 1842-81, is the subject of Volume II of this study.

Summary: U.S. MUSKET FACTORY CANAL, 1799 -1841:

The plan for the U.S. Musket Factory canal along the south bank of the Potomac River was prepared by the English engineer James Brindley, who marked out the site and line of the canal, April 28-May 6, 1799. Paymaster John Mackey entered into a contract with Col. Abraham Shepherd to construct to new canal, which was to be about one and one-quarter miles long. Due to the inexperience of the contractor and the extreme shortage of labor, progress on construction was very slow. By the end of 1799 the canal was apparently less that half complete. In May 1800 the new Paymaster, Samuel Annin,personally took charge of canal construction but again the shortage of labor prevented rapid progress. Finally, in May 1801, water was let into the canal and the manufacture of arms got underway at Harper's Ferry, perhaps one year behind schedule.

The location and nature of the first Musket Factory canal is shown on Maps No. 2 and 3, drawn in 1803, on pages 20A and 21 of this report.

In 1820-21 the U.S. Musket Factory dam on the Potomac was rebuilt to provide an additional supply for water for the water wheels of the U.S. Musket Factory shops. The dam accomplished its objective but the canal then proved to be too small to carry the increased flow of water. During 1822 the Armory spent a total of $ 2,434.75 erecting a stone wall for the support of the north or outer bank of the canal averaging about 10 feet in height and about 1½ miles long. About 835 perches of dry walls and 6,785 square yards of stone masonry mortar wall were built during 1822.

In 1828 the Armory launched a project to deepen and widen the Musket Factory canal by raising the height of the inner or southern bank and constructing a stone wall along the inner side of the canal.. The inner wall, with foundations about two feet square and the upper wall five feet high and 18 inches thick, was intended to prevent the canal from overflowing the road along the inner bank and also increase the flow of water in the canal. Work on this project got underway in late 1828 and continued into early 1832. About $ 19,951.72 was spent and 11,205 perches of stone wall and 25,317½ cubic yards of earth embankments were built.[1]

In 1833-34 the Armory enlarged the canal by building a new section "from the termination of the present canal at the cross wall," about 1,980 feet, " to a point opposite the conner of the stone house occupied by Michael Crowl." The walls and embankments of this section were constructed under contract by Johnson Garrett. Cost of construction was $ 18,449.83. Vouchers detailing this construction are not complete, but the extant records indicate that Garrett erected more than 2,660 perches of stone wall and more than 38,280 cubic yards of embankment in 1833-34.

From 1828 to 1834 a grand total of $ 38,982.59 was spent enlarging and

1. An additional $ 5,513.60 was also spent 1828-32 on the stone foundations and embankments of a new tilt hammer shop that was to be erected on the north bank of the canal. In 1834 it was decided to constructed the tilt shop in a new location and the old site served only as a part of the walls of the canal.

REPAIR AND IMPROVEMENT OF THE U.S. MUSKET FACTORY CANAL, 1821 - 1841:

Year	Stone Mortar Wall,	Perches Dry Wall	Cost	Embankment, cubic yds.	6 Acre Res. Canal Wall	Puddling canal	Potomac Co. Lock, Md. side	
1822	square yds 6,785	835	$ 2,434.75	Stone wall, north bank canal, 1¼ miles long, averaging 10 feet in height				
1825	repair		130.00					
1826			151.74				wall- 172 perch	
1827			100.00				improvements- $ 100.00	
1828	perches		200.00				new gates- $ 200.00	
1828	200		782.36	South stone wall Foundation 2 by 2 ft. Top wall 5 feet high, 18 inch thick				
1829	2,293½		3,752.35	6,320½	391.50			
1830	2,440		9,043.00	9,800				
1831	2,589		4,803.37	4,350				
1832			1,673.30					
1833	Enlargement of the canal for 1,980 feet from the cross wall to Michael Crowel's house. Widen canal 460		7,833.08	27,880				
1834	2,200+		10,616.75	10,400 +				
1837-38	Making Canal water-tight		4,044.76	for mud-puudling inner side of embankment 1,960 feet long, 3 feet thick, average breath 26 feet, making 7,511 cubic yards. Inner face of embankments				
1837-38	making more new embankments		7,002.75	faced with flat stones; this to be faced with coat of puddling 5 fet thick				
1837-38	Other costs		575.67					
1840	cleaning canal		100.00	for removing 10,000 cubic yards of earth and rock from middle of canal.				
1841		265	$ 365.20	superstructure of stone on top of river wall opposite to dam, about 460 feet long, to facilitate entrance of boats into inlet of canal.				

rebuilding the U.S. Musket Factory Canal. The plan of the rebuilt canal of 1834 is shown on Map No. 6, drawn ca. 1837-38, page 182 of this study. Photo No. 1, p. 76, painted 1826, shows the Armory canal and bridge at that date.

In 1837-38 the Armory spent a $ 11,623.18 on the canal. Of this sum, $ 4,044.76 went to make embankments of the new canal water tight by mud-puddling the inner side of the embankment 1,560 feet in length, five feet thick, with an average breath of 26 feet, making about 7,511 cubic yards of puddling in all. An additional $ 7,002.75 was expended for building new embankments and $ 575.67 went for repairs and cleaning out the canal.

Total Expenditures on the U.S. Potomac Canal, by period, were about as follows:

Period	Canal Expenditures
1817 - 21	$ 1,345.00
1822-29	8,454.08
1830-35	33,969.50
1836-41	12,099.38
TOTAL:	$ 55,867.96

SUMMARY, U.S. MUSKET FACTORY DAM ON THE POTOMAC, 1799 - 1841:

James Brindley, the English engineer who prepared the plan for the U.S. Musket Factory canal, also prepared the plan for the U.S. Potomac dam. From August 9 to October 22,1799,using a small crew of workmen for 64 working days, Brindley supervised the construction of this partial masonry dam at Harper's Ferry. The engineer then left the town. At the end of December 1799, Armory Paymaster John Mackey reported that the dam was only about one-third complete. The new Paymaster, Samuel Annin, who reported for duty at Harpers Ferry in May 1800 completed the construction of first dam in 1800-01; Water being turned into the Musket Factory canal for the first time in May 1801.

The plan of the first Musket Factory dam, as completed in 1801, can be seen on Map No. 2,drawn in 1803, page 20a. The first dam may not have extended all the way across the river.

The first dam failed and gave way in part in 1808. Paymaster Samuel Annin constructed the second dam in 1808-09 and probably built the new dam about six to eight feet below(east of) the original dam. The second dam may have been secured to the first structure by " bolts and ties of locust." By 1820 the second dam was "much decayed" and it was decided to construct a new dam to replace the old structure and to increase the supply of water for the Musket Factory Canal.

The contract for constructing the third dam went to the mason John Lowstetter and the total cost of construction came to about $ 11,200.00. The third dam, built 1820-21, was to be constructed of stones six to eight feet long, quarried and laid by Lowstetter. The dam was to be 300 feet long(width of the river was estimated at 1,100 feet), eight feet thick at the base, six feet thick at the top, and " to be of the proper height to answer for turning a sufficiency of water into the Canal." The Paymaster's vouchers indicate that John Lowstetter built about 2,940 perches of stone wall in the dam. Also constructed in 1820 was a stone lock with wooden lock gates at the head of the canal and adjacent to the dam for admitting boats into the Armory canal.

The third dam increased the supply of water so much that the Musket Factory Canal proved to be too small and had to be rebuilt in 1822 at a cost of $ 2,434.75 to handle the increased flow.

The total estimated value of "mill-dams, canals, bridges, and other permanent improvements" of the Harper's Ferry Armory on December 31,1821 was placed at $ 105,000.00. Nearly all of this was for improvements of canal and dam on the Potomac River.

In 1828 Superintendent James Stubblefield prepared a plan for a 4th dam. The new dam was to be located just below the 1820-21 structure and space between the two dams was to be filled in with gravel. The purpose was to increase the supply of water for the Musket Factory Canal. The contract, which was let to Lewis Wernwag, specified that the new dam was "to commence at the second angle of the old dam from the head of the Armory Canal and extended thence along the course of immediately below the old Dam 60 rods." The new dam was to be "10 feet wide and filled in with stone in such a manner as to render it tight and permanent." The dam was also apparently to have a timber superstructure. Cost of construction of the fourth dam was about $ 5,917.14, of which $ 3,511.63 went to contractor Wernwag and $ 1,945.00 for timber. Vouchers covering Wernwag's work are not complete, but extant documents indicate that he erected at least 854 perches of stone wall and made 1,200 cubic yards of embankment.

In 1833 the Potomac Dam was repaired and extended for a fifth time. at a cost of about $ 3,474.55. The plan was prepared by engineer Alfred Cruger, who also supervised the construction. The contract for the work was awarded to Lewis Wernwag who received $ 3,174.55 for making 41 perches of dry masonry wall, 93 perches of mortar masonry wall secured by bolts and clamps; 265 cubic yards of embankment and 33 7/100 running rods of dam. The purpose of this rebuilding, completed in 1833, was to repair the old structure and to increase the supply of water for the canal.

In 1834-35 and additional $ 831.79 was expended to make repairs to the Potomac Dam. During the period 1836 to 1841, a total of $ 793.66 was spent for repair of the dam. $ 705.66 of this amount was spent during the third quarter of 1838.

Total expenditures on the U.S. Potomac Dam from 1817 to 1841 were approximately $ 22,305.40. These were spent by period as is shown on the following chart:

CONSTRUCTION AND REPAIR ON U.S. MUSKET FACTORY DAM ON THE POTOMAC, 1820 - 1841:

Year	Expenditure	Perches Stone Wall	Length of Dam built	Cubic yards embankment, dam	Building lock for canal	cost of lock work	For timber used	Contractor
1820-21	$ 11,200.	2,940	300 feet	500	wall 1,075½ perch	$ 1,13.12		John Lowstetter
1827	187.87	repair						
1828-29	5,917.14	854 +	60 rods, or 990 ft, from 2nd angle.	1,200 +			$ 1,945.01.	Lewis Wernwag
1832	1,280.33	repair						
1833	3,474.55	134	33 7/100 rods	265	17 1/3 perch mortar wall	7 perch dry wall		Lewis Wernwag
1834	489.04	repair						
1835	342.75	repair						
1837	88.00	repair						
1838	705.66	repair						
1820-41	$							

(Total length of dam when extended fully across Potomac about 1,470 feet).

U.S. MUSKET FACTORY, 1817 - 1841

Period	Dam Expenditures	Canal Expenditures	Canal & Dam Expenditures
1817 - 21	$ 11,200.00	$ 1,345.00	$ 12,545.00
1822 - 29	6,105.01	8,454.08	14,559.09
1830 - 35	4,206.73	33,969.50	38,176.23
1836 -41	793.66	12,099.38	12,893.04
Total	$ 22,305.40	$ 55,867.96	$ 78,173.36

Estimated value of canal, dams, bridges,etc:

1821: $ 105,000.00

1831: 145,177.68.

The Plan of the U.S. Musket Factory dam on the Potomac, together with that of the head gates and lock to the Musket Factory Canal, can be seen on Map No. 6, drawn ca. 1837-38, on page 182 of this report.

Extracts from a report prepared by Col. George Talcott, Chief of Ordnance, Ordnance Department, Washington, D.C. June 10,1848 To accompany the Report of the Secretary of War of June 10, 1848; in answer to a resolution of the Senate of April 28, 1848.

Extracts for period 1794 to 1841

From Congressional Serial Number 509, Document No. 54, pages, 10, 12, 14, and 16.

"Statement of expenditures at the U.S. armory at Harper's Ferry, Virginia, and of the arms and appendages made therein," from its establishment to 30th of September, 1841.

B.

Statement of expenditures at the United States armory at Harper's Ferry, Virginia, and of the arms and appendages made therein, from its establishment to the 31st of March, 1818.

[To accompany report to the Secretary of War of June 10, 1848, in answer to a resolution of the Senate of April 28, 1848.]

YEARS.	For land, including mill sites and the houses on the land when purchased.	Buildings, milldams, canals or races, and other permanent improvements, including machinery.	Repairs of buildings, dams, &c.	Total for lands, buildings, and improvements.
From its establishment in 1796 to the 31st of December, 1821*	$12,877 28	$256,509 41	$66,793 32	$366,180 01
December 31, 1822		5,134 75	350 00	5,484 75
Do 1823		11,037 80		11,037 80
Do 1824		16,271 96		16,271 96
Do 1825		4,101 50	2,171 50	6,273 00
Do 1826		9,847 66	431 97	10,279 63
Do 1827		7,550 87	(3)	7,550 87
Do 1828		6,533 00	5,500 00	12,033 00
Do 1829		(1) 1,461 82	157 33	(2) 1,619 15
Do 1830		14,431 93		14,431 93
Do 1831		18,237 33		18,237 33
Do 1832		18,408 68		18,408 68
Do 1833	2,600 00	33,422 91		36,022 91
Do 1834		45,038 16		45,038 16
Do 1835		23,432 47		23,432 47
Do 1836		28,678 42		28,678 42
Do 1837		81,579 27		81,579 27
Do 1838		55,541 11		55,541 11
September 30, 1839		26,752 49		26,752 49
Do 1840		18,315 53		18,315 53
Do 1841		57,578 88	16,423 99	74,002 87
Totals:, as given:	$ 45,477.28	728,955.10	91,828.11	$ 866,260.28
Totals should be:	45,477.28	742,125.10	93,347.98	880,950.36

(1) 1829 should read $ 14,631.82.

(2) 1829 should read $ 14,789.15.

(3) 1827 $ 1,519.87 in repairs ommitted.

ORDNANCE OFFICE, *Washington, June 10, 1848.*

G. TALCOTT, *Colonel Ordnance.*

* This line gives the totals of the report in detail made 30th November, 1822. [See State Papers, vol. 2—military affairs, page 481.]

B—Continued.

YEARS.	For the manufacture and repair of arms, including materials, wages, salaries, stationery, postage, forage, horses, &c.	Miscellaneous expenses, not included in the foregoing.	Total, exclusive of lands and improvements.	ARTICLES MANUFACTURED.	
				Flint lock muskets.	Percussion muskets.
From its establishment in 1796 to the 31st of December, 1821*	$2,171,490 85	$63,438 49	$2,234,929 34	119,911	.....
December 31, 1822	148,615 84	1,086 00	149,701 84	10,000	.....
Do 1823	173,021 14	492 00	173,513 14	12,200	.....
Do 1824	179,325 98	592 00	179,917 98	10,559	.....
Do 1825	181,856 91	2,660 13	184,517 04	14,000	.....
Do 1826	155,358 92	1,675 81	157,034 73	8,720	.....
Do 1827	191,370 82	2,099 00	196,469 82	12,020	.....
Do 1828	184,114 80	1,457 82	185,572 62	10,000	.....
Do 1829	170,444 96	3,612 37	174,057 33	8,895	.....
Do 1830	149,790 80	1,344 69	151,135 49	10,130	.....
Do 1831	168,664 95	608 85	169,273 80	11,160	.....
Do 1832	204,211 05	674 26	204,885 31	12,000	.....
Do 1833	171,785 40	1,192 08	172,977 48	12,000	.....
Do 1834	173,822 04	1,550 28	175,372 32	12,000	.....
Do 1835	138,560 34	7,696 83	146,257 17	10,000	.....
Do 1836	149,487 27	2,292 88	151,780 15	9,150	.....
Do 1837	149,544 33	2,839 42	152,383 75	8,200	.....
Do 1838	178,231 70	6,711 18	184,942 88	12,000	.....
September 30, 1839	150,677 01	4,958 01	155,635 02	5,850	.....
Do 1840	150,381 80	5,956 23	156,338 03	8,304	.....
Do 1841	180,318 66	814 50	181,133 16	8,650	.....
TOTAL (as given)	$ 5,521,075.57	113,752.83	$ 5,637,828.40		

Muskets: 313,749

* This line gives the totals of the report in detail made 30th November, 1822. [See State Papers, vol. 2—military affairs, page 481.]

B—Continued.

YEARS.	ARTICLES MANUFACTURED. Rifles.	Pistols.	Hall's patent rifles.	Carbines.	Ball-screws.	Wipers.
From its establishment in 1796 to the 31st of December, 1721*.....	19,718	4,088	.....	.....	19,718	19,718
December 31, 1822.....	.....	.....	.....	.....	.....	.....
Do 1823.....	.....	.....	.....	.....	.....	.....
Do 1824.....	.....	.....	1,000	.....	.....	8,173
Do 1825.....	.....	.....	.....	.....	5,000	11,000
Do 1826.....	.....	.....	.....	.....	5,327	31,827
Do 1827.....	.....	.....	1,000	.....	.....	34,998
Do 1828.....	.....	.....	.....	.....	.....	25,000
Do 1829.....	.....	.....	.....	.....	.....	.....
Do 1830.....	.....	.....	.....	.....	.....	.....
Do 1831.....	.....	.....	.....	.....	.....	.....
Do 1832.....	.....	.....	4,360	.....	.....	4,360
Do 1833.....	.....	.....	3,670	.....	.....	19,100
Do 1834.....	.....	.....	970	.....	6,896	22,360
Do 1835.....	.....	.....	1,714	.....	.....	1,714
Do 1836.....	.....	.....	1,809	.....	.....	1,770
Do 1837.....	.....	.....	1,200	1,017	614	17,135
Do 1838.....	.....	.....	2,934	.....	1,136	41,019
September 30, 1839.....	.....	.....	.....	.....	.....	22,914
Do 1840.....	.....	.....	1,023	1,003	.....	10,946
Do 1841.....	.....	.....	190	.....	1,663	4,423
Totals:	19,718	4,088	19,870	2,020	40,354	276,756

B—Continued.

YEARS	ARTICLES MANUFACTURED. Screw drivers.	Bullet moulds.	Spring vices.	Flint cups.	Rifle chargers.	Arm chests.
From its establishment in 1796 to the 31st of December, 1821*.....	37,750	19,718	6,034	.....	19,718	.....
December 31, 1822.....	5,594	.....	.....	.....	.....	500
Do 1823.....	10,343	.....	.....	.....	.....	921
Do 1824.....	6,922	1,000	.....	.....	1,000	212
Do 1825.....	26,926	.....	.....	.....	.....	848
Do 1826.....	53,112	.....	.....	.....	.....	888
Do 1827.....	8,475	.....	10,100	.....	.....	772
Do 1828.....	35,679	1,000	.....	.....	1,000	1,164
Do 1829.....	3,653	.....	.....	.....	.....	837
Do 1830.....	.....	.....	.....	51,575	.....	564
Do 1831.....	.....	.....	.....	7,464	.....	274
Do 1832.....	4,360	436	436	6,632	20	137
Do 1833.....	3,682	367	367	17,084	20	102
Do 1834.....	25,941	47	47	6,000	4,734	74
Do 1835.....	1,714	171	171	2,000	.....	226
Do 1836.....	1,770	177	177	10,000	8,000	447
Do 1837.....	22,809	301	200	70,000	881	626
Do 1838.....	25,424	395	1,334	3,000	.....	1,563
September 30, 1839.....	29,000	.....	4,041	.....	.....	669
Do 1840.....	5,202	55	3,418	10,080	.....	2
Do 1841.....	4,199	25	49	14,817	.....	133
Totals	305,633	23,692	27,274	198,642	30,373	10,958

* This line gives the totals of the report in detail made November 30, 1822. [See State Papers, vol. 2—military affairs, p. 481.]

CHAPTER X

DESCRIPTIVE CATALOG OF U.S. MUSKET FACTORY BUILDINGS ERECTED IN THE PERIOD 1798 to 1841:

1. Temporary Armory- Superintendent's First House, 1798-1809:

Location: At the eastern or lower end of the Musket Factory Yard, adjacent to and on the north side of the main entrance to the yard from Wager Ferry Lot reservation.

Map References: Bldg. No. 11 on Map 3 (1803), p. 21.

History: A one-story frame warehouse about 90 feet long and 23 feet wide had been erected by John Wager, Sr., between 1782 and 1796 to shelter goods waiting to be ferried across the Potomac River. Wager sold the warehouse to the United States for $ 350.00 in 1796.

Paymaster John Mackey remodelled the warehouse in October 1798 for use as a temporary :"Armory" or factory where arms could be repaired until the permament brick workshops intended for this purpose could be constructed. The structure served as a temporary armory from 1798 to 1801.

In October 1801, the frame Armory underwent a second transformation and was converted at an approximate cost of $ 400 into a residence for John Perkin, the first superintendent of the Harper's Ferry Armory, who resided in this dwelling house until his death in December 1806. (1)

James Stubblefield, the next superintendent, who arrived at the Armory in April 1807, declined the opportunity to live in Perkin's former house. The structure was then leased from June 1807 to September 1809 to Theodore Beall, who used the remodelled building as his residence and store. By 1809 the wooden structure was considered to be a fire hazard to the new brick workshops that had been erected adjacent to the building during the years 1808-09. In September 1809 the frame warehouse-factory-dwelling was dismantled and removed from the Musket Factory yard, Undergoing a third remodelling, its timber were erected in 1809-10 as two two-story brick and frame dwelling houses each measuring 20 by 40 feet in size. In 1811 one was being used as a two-family residence and the other as a one-family dwelling. The relocated houses probably stood on Shenandoah Street.

These two dwellings(listed as wooden houses in the 1821 inventory), were apparently still standing in 1821 and each residence was valued at $ 1,250.00. The history of the two quarters after 1821 is not known.

(1) Roof was covered with wood shingles.

2. The Armory or Factory; Boring Mill, 1799- 1844:

Location: Near the eastern(lower) end of the Musket Factory yard and on the north bank of the armory canal. After 1810 it stood in the southern line of workshops, third from eastern end of that row.

Map References: Bldg. No. 1 on Map 3 (1803), p. 21; Bldg. No. 3 on Map No. 4(1834), p. 122; Bldg. 3 on Map No. 6, p. 182(1837). The site of the 1799 building is occupied by Bldg. No. 3- the new"Boring Mill" on both Maps No. 7 (1844), p. 183, and Map No. m 8(1848), p. 184.

History: A large brick workshop designed and erected by Paymaster John Mackey in 1799, this was the first permanent "Armory" or factory of the U.S. Musket Factory. The first floor then held four wooden water wheels and the machinery for grinding, boring, and polishing arms. The second floor contained the workshops for the filers and stockers. The third floor attic or garret was used to store gunstocks, lumber, tools, and other stores.

The two and one-half story brick shop had a gable roof that was covered with wood shingles and that was also crowned with three chimneys.(1) The 1799 dimensions were given as " 26 feet by 120 feet clear of the walls." The 1811 exterior dimensions were reported to be 123 by 29 feet, where it was listed as Bldg. No. 3. On the 1821 inventory, the exterior dimensions are given as 120 by 30 feet; its height at two stories, and its value at $ 10,000.

The roof of the Boring Mill, as it was then known, was covered with slate in 1832 in order to reduce the danger from fire.

In 1833 Congress appropriated $ 8,400 to rebuild three wooden water wheels, their forebays, to construct new machinery and to sink flumes for three of the principal old water shops at the Musket Factory. This modernization work included the Boring Mill. Its forebay was rebuilt of stone and its raceway widened and deepened so that a large water wheel could be installed. The cost of this rebuilding for the three shops far exceeded the original appropriation and Congress provided the additional sum of $ 26,040.47 to complete this modernization in May 1834. The work on the three old shops was finished in 1839 and it is estimated that about $ 11,446, or one-third of the total of $ 34,440 appropriated was spent at the Boring Mill.

The rebuilding of the Boring Mill wheel and machinery, however, did not approve to be effective. By 1842 the Ordnance Department decided to demolish the old mill and to erect a new Boring Mill on its site. The Chief of Ordnance explained the need for a new building to Congress in the estimates for the January 1, 1843 - June 30,1844 fiscal year as follows:

"The present [1799] boring mill is too low between the floor and the ceiling, and too narrow, in consequence of which the shop is dark and badly ventilated, and the machinery too cramped..." (2)

(1)See Photo No. 1,p.76, ca. 1826. However, the cupola shown on the roof of the Boring Mill, the second workshop from the head of the east end of the line of shops in this painting,actually was located on the roof of the first workshop.

(2) Estimates for 1843-44, Harpers Ferry NHP Reel 20, Vol. 6, p.37-38.$ 6,500.00 was requested to erect the new boring mill.

On August 15, 1844, the mason Peter Litle was paid $ 141.83 for "taking down the old Boring Mill" and for salvaging 137,836 bricks from that structure.(3) The slate George W. Tacey (or Tracey) received $ 39.00 on August 19, 1844 "for taking off old slate roof of Old Boring Mill."(4). The salvaged slate was to be reused on the roofs of the shops at the U.S. Rifle Factory.

Construction on the new Boring Mill got underway in August 1844.

3. The Smiths Shop- Store House and Master Armorer's Office, 1799 - 1847:

Location: Situated immediately to the west of the 1799 "Armory or Factory (see Item 2 above). After 1810 it stood in the southern line of workshops, on the north bank of the canal, and fourth in that line from the lower or eastern head.

Map References: Bldg. No. 2 on Map No.3 (1803), page 21; Bldg. No. 4 on Map No. 4(1834), page 122; Bldg. No. 4 on Map. No. 6(1837),page 182; Bldg No. 4 on Map No. 7(1844), page 183; and the former site of the Store House on Map No. 8 (1848), page 184, is occupied by the "new Stocking Shop," which had been erected in 1846-47.

History: This large brick workshop was designed and constructed by Paymaster John Mackey in 1799. The two-story brick structure had a gable roof that was covered with wood shingles. The 1799 dimensions were given as 26 by 80 feet" clear of the walls." Listed as Bldg. No. 6 on the 1811 inventory of building, its dimensions were reported to be 83 by 30 feet. The 1821 inventory gave the dimensions as 80 by 30 feet and estimated the building's value to be $ 6,000.

In 1799 the first floor held 10 forges, each with its own chimney, arranged in two rows. Thus 10 chimneys, five on each side, pierced the gable roof of the smith's shop (See Photo No. 1, p. 76, ca. 1826 painting). The second floor in 1799 contained the workshops of the filers. The Smiths shop had neither water wheels or machinery.

At some undetermined date after the War of 1812 but prior to 1821 the smiths and filers ceased their operations in this structure and the building was henceforth utilized as a stor house and as the office of the Master Armorer. The roof was slated at cost of $ 150.00 during the third quarter of 1831 in order to reduce the danger from fire. (5)

3. National Archives R. G. 217, Records of 2nd Auditor, 3rd Series, File 16983, Voucher No. 14.
4. R.G. 217, 3rd Series, File 16983, Voucher 17.
5. R.G. 217, 1st Series, File 15936.

On July 2,1847, the master Peter Litle was paid $ 80.00 "for taking off roof, pulling down and removing old shop(Master Armorer's Office) to clear site for new stocking and machine shop." (1)

4. Forge or Mill for Heavy Forging, 1799 - 1808(?):

Location: Situated on the north bank of the Armory canal, immediately west of the 1799 Smiths Shop, item 3 above.

Map References: Bldg. No. 3 on Map No. 3(1803), p. 21.

History: Probably a one-story brick building with wood shingle roof, this shop was designed and erected by Paymaster John Mackey in 1799-1800. Its approximate dimensions, judging by Map No. 3, were 26 by 30 feet. The Forge or Mill contained one eight-foot breast-type water wheel, the largest wheel at the Armory. The wheel supplied power for the tilt hammer for heavy forging, which was used for working iron and preparing barrel skelps for hand welders.

The Armory had a total of five water wheels in the Musket Factory plant in 1801 and their average breath was 4.2 feet.

This shop may have been incorporated into the large Tilt Hammer Shop that was erected in 1808-09 about on the site of the 1799 Mill. In any event, the Forge or Mill for Heavy Forging was not standing in 1821.

5. Store House for Coal, 1800- 1809?

Location: On the north bank of the Armory Canal, the fourth building from the eastern or lower line of workshops in 1803.

Map Reference: Bldg. No. 4 on Map No. 3(1803), page 21.

History. Built in 1801 and designed by Paymaster Samuel Annin, this was probably a one-story frame building about 20 by 15 feet in size. The Coal House was used to store coal that was used by the smiths. The coal house is not included in the 1810 inventory of Armory buildings.

6. Proving or Proof House, 1800 - 1809(/?):

Location: On the north bank of the Armory canal, the fifth building from the eastern or lower line of workshops in 1803.

Map Reference: Bldg. No. 5, the "Proving House," on Map No. 3 (1803), page 21.

History: Built in 1800 by Paymaster Samuel Annin, the Proof House was a small, probably frame and stone, structure. The edifice was used to test musket barrels.

The Proving or Proof House is not included on the 1810 inventory of Armory buildings.

(1). R.G. 217, 3rd Series, File 5623, Voucher 48.

Also standing in February 1803, were three small, probably frame structures in the Musket Factory yard, whose use is unknown. They may have been offices, a workshop for the carpenters, and perhaps latrines. These are Bldgs. No. 8, 9, and 10 on Map No. 3 (1803), page 21.

B. Buildings Constructed during 1808-11 Enlargement of Plant:

7. Superintendent's Residence, 1808- 1885:

Location: This building stood at the eastern or lower head of the line of Musket Factory shops on the north bank of the Armory canal. The canal, however, did not extend as far east as the residence

Map References: Bldg. No. 1 on Map No. 4(1834), page 122; Bldg. No. 1 on Map No. 6 (1837),page 182; Bldg. No. 1 on Map. No. 7(1844), p. 183; and Bldg. No.1 on Map No. 8 (1848), p. 184.

History: The brick residence was designed and erected by Superintendent James Stubblefield and Paymaster Samuel Annin in 1808 - 09. The 1811 inventory of buildings, which lists this structure as Bldg. No. 1, describes the edifice as a two-story brick dwelling house with a cellar kitchen; dimensions are given as 36 by 29 feet. In the 1821 inventory of buildings, the residence is described as a two-story brick house with cellar, the dimensions as 36 by 30 feet, and its value was estimated at $ 3,000.00.

In 1828-29, a large brick addition was made to the east end of the dwelling and the interior of the original house was extensively remodelled at a total cost of $ 2,429.75. The brick addition, one-story in height, apparently contained a kitchen and perhaps servants' quarters. The roof of the main house and wing were also slated. The dimensions of the residence after the 1828-29 work appear to have been about 100 by 30 feet: the main house measuring 36 by 30 feet and the long wing perhaps 64 feet by about 20 feet.

The fine brick house served as the residence of Superintendent James Stubblefield from ca. 1808 until his retirement in 1829. The following Armory superintendents then resided in the dwelling: Thomas B. Dunn, 1829-30; George Rust, Jr., 1830-37; Edward Lucas, Jr., 1837-41; and Major Henry K. Craig from 1841 to 1844.

The residence was repaired in 1844 and from November 1844 until 1847 it next served as the residence of Armory Paymaster Richard Parker.

In 1847-48, at a cost of approximately $ 850.00, the old residence was remodelled and converted for use as the central office building of the Armory, thus containing the offices of the Superintendent, Paymaster, and Master Armorer from 1848 to 1861. During 1847-48, the main house was reduced to one-story in height and its roof slated. The former kitchen on the east end was converted into a money vault with heavy masnory wall from 3 to 3½ feet thick, and its roof "covered with flag stones of very great size and weight" . The vault, of course, was for the use of the Paymaster.

The Armory Central Office building survived the Civil War and was still standing as late as 1885(See HF NHP Negatives No. HF-27B and HF - 492). The structure, however, was demolished at some undetermined date after 1887 and prior to 1892.

8. Finishing/ Turning, or Bell Shop, 1809 - 1865:

Location: This shop in the southern line of Musket Factory workshops, standing on the north bank of the Armory Canal, was located at the eastern or lower end of that row, immediately west of the Superintendent's 1808 house(Item 7) and directly east of the 1799 Factory or Boring Mill (Item No. 2).

Map References: Bldg. No. 2 on Map No. 4(1834), page 122; Bldg. No. 2 on Map No. 5 (1837), p. 181; Bldg. No. 2 on Map No. 7(1844),p. 183, and Bldg. No. 2 on Map No. 8 (1848), page 184.

History: This, the largest workshop at the Musket Factory until the 1840's, was designed by Superintendent James Stubblefield and constructed by Paymaster Samuel Annin in 1809-10. The two-story brick factory had a wood shingled gable roof that was pierced by three chimneys (See Photo No. 1, a ca. 1826 painting, p. 76). The shop was Building No. 8 on the 1811 inventory of buildings, which give that structure's dimensions as 131 by 45 feet. The 1821 inventory of buildings also gave the dimensions as 131 by 45 feet, described it as a two-story brick shop and estimated its value at $ 15,000.00.

Known as the finishing or turning shop, the forebay and water wheels of this building were constructed of wood. In 1811, the first floor held the water-powered machinery of the finishing shop and also a room that was used for storing musket stocks. In 1811 the second floor contained the office of the Armory Superintendent, a storage room, a filing shop, and a room that was used as "a meeting room" for religious services on Sunday. The meeting room apparently served this purpose on Sundays from 1811 to about 1825, when the first church was constructed in Harpers Ferry.

On May 8, 1824, a serious fire swept through this shop : destroyed the roof, interior woodwork, water wheels, machinery, and tools, but left the brick walls standing. The shop was reconstructed in 1824-25 at a cost of $ 10,000, with $ 5,000 going for the structural work and $ 5,000 for rebuilding the machinery and water wheels. During this work the new roof was slated and a lath and plaster ceiling installed. In March 1825 a cupola or belfry was constructed on the roof of the Finishing or Turning Shop and the structure was henceforth commonly called "the Bell Shop." The bell was used to call the men to work in the morning and to signal lunch and the end of the day.

In 1831 a small building, attached to the finishing shop, was constructed at a cost of $ 152.00. This addition contained grindstones and machinery for the same.

At some unknown date after 1825, but prior to 1839, " a large chimney stock of masonry" was apparently added to the roof of the Bell Shop " to accommodate a forge fire on each floor." (See Photo No. 2,p.129).

In 1833 Congress appropriated the sum of $ 8,400 to rebuild three wooden water wheels, their forebays, to construct new machinery, and to sink flumes for three of the principal old water shops at the Musket Factory. The Bell Shop, referred to in the act as the "Turning Shop", was included in this project. Its forebay was rebuilt of stone and its raceway widened and deepened so that a larger water wheel could be installed. The cost of modernization work on the three shops far exceeded the original appropriation

and in May 1834, Congress provided the additional sum of $ 26,040.47 to complete this project. The work on the three old shops was finished in 1839. It is estimated that about $ 11,446, or one-third of the total of $ 34,440 appropriated was spent at the Turning or Bell Shop.

During the 3rd and 4th quarters of 1839, the masons received a total of $ 514.39 for rebuilding the forebay of this shop of stone.

Because of its great size, 131 by 45 feet, the Old Bell Shop apparently proved useful and adaptable to the changes and improvements that were made at the Musket Factory from 1842 to 1861. The Finishing/ Turning or Bell Shop was thus the only pre-1841 workshop to escape demolition and hence was still standing in 1861.

Confederate troops seized the Armory on April 19, 1861 and removed much of the machinery. On June 14, 1861, they set fire to the Musket Factory workshops and store houses and on the following day retreated from Harpers Ferry. The roof and interior woodwork of the Old Bell Shop were destroyed but the strong brick walls were again left standing

In 1862 and again in 1864-65, the Union Army covered the Bell Shop walls with a temporary roof. During the latter period the structure served as warehouse holding supplies that were sent for the support of Sheridan's operations in the Shenandoah Valley. (See HF NHP Negative No. HF-27B, taken 1864 or 1865, for the use of the Bell Shop as a warehouse).

The brick walls of the Finishing/Turning or Bell Shop thus survived the Civil War, but were demolished after 1865 and prior to 1873.

9. Tilt-Hammer/ Stocking Shop, 1808- 1849:

Location: Located in the southern line of workshops that stood on the north bank of the armory canal, and was situated immediately west(above) the 1799 Smiths Shop/Store House and Master Armorer's Office(Item No.3 above).

Map References: Bldg. No. 5 on Map No. 4(1834), page 122; Bldg. No. 5 on Map No. 6(1837), p. 182; Map No. 7(1844), page 183- Bldg. 5, and also Bldg. 5 on Map No. 8 (1848), page 184, where it is called "Old Stocking Shop."

History: This two-story brick workshop was designed and erected by Superintendent James Stubblefield and Paymaster Samuel Annin in 1808 - 09. It may have incorporated within its wall the Forge or Mill for heavy forging that had been erected in 1799(See item No. 4 above). In any event, the 1808 structure occupied the site of the 1799 mill(Compare Map No. 3(1803) page 21 with Map No. 4(1834), page 122). The gable roof of the 1808 shop was covered with wood shingles and there were three chimneys.(See Photo No. 1, ca. 1826 painting, page 76).

Bldg. No. 7 on the 1811 inventory of buildings, its dimensions were given as 101 by 30 feet. The 1821 inventory of buildings lists the dimensions as 111 by 30 feet and sets the estimated value at $ 8,000.

In 1811 the first floor contained the tilt shop with water wheel and machinery for tilting and also a room to store iron. Due to the great shortage of housing in Harpers Ferry, the second floor of this factory, which was intended for use as shops, was then being used to provide lodging rooms for the armorers.

At some undetermined date, but probably after 1815 and prior to 1827, the tilt hammer operations ceased at the shop and the building was altered for use as a stocking shop. The edifice was used as a stocking shop from ca. 1827 to 1849.

The roof of the Stocking Shop was slated in 1832 in order to reduce the danger from fire. In 1834 Congress appropriated $ 8,400 for constructing new water wheels and machinery in the turning shop(item 8 above), the boring shop(item 2 above), and the stocking shop. It was reported that their wooden water wheels and machinery generally "are so much worn and decayed as to require very frequent repair", and that during these period of repairs, operations had to cease at the shops. The wooden forebay of the Stocking Shop was rebuilt of stone and its raceway widened and deepened. The cost of rebuilding the three shops, however, far exceeded the original appropriation and on May 14, 1834, Congress voted an additional $ 26,040.47 to complete the job. The work on the three shops was completed in 1839 and it is estimated that $ 11,446, or about one-third of the total of $ 34,440 appropriated was spent at the Stocking Shop.

The plaster in the stocking shop was repaired in 1842 and again in 1844. (1)

In the estimates for 1846-47, the Ordnance Department requested funds to construct a new stocking shop and a machine shop as well. It was explained to Congress that:

> The building now used for stocking and machine shops were built upwards of 30 years ago (when machinery was not in use), slightly, like a common house, and of bad material. These are now in a ruinous state, and require to be propped up and stayed to prevent their falling. Besides they are so low on the ground that the driving machinery and lower floors, in high freshets, are several feet under water, interrupting the operations and ruining the machinery. (2)

On May 19,1849, the mason Edward Tearney received $ 70.00 "for taking down & removing the slate roof, timbers, brick and materials of the old stocking shop." (3) A new machine shop was to be erected on its former site.

(Also see Item 33, page 267 for Shop for Half Stocking Machinery, erected in 1827-28 at a cost of $ 2,800 and perhaps added to the western or upper end of the Stocking Shop.)

1. R.G. 217- 2nd series, file 7045-1st quarter of 1842:To Hiram McKemzie, March 29,1842,$ 13.37 for plastering stocking shop; 3rd series-file 1165-Voucher No. 18- to James Bowen,May 3,1844, $ 19.96 for plastering 109 6/7 yards in stocking shop.
2. Serial No. 481. Document 9, p. 111. Estimates for 1846-47 year.
3. R.G. 217, 3rd Series, File 9307, Voucher 23, part of bill of $ 1,024.65 paid to Tearney for services rendered.

10. Smiths or Forging Shop, 1808 - 1847:

Location: In the northern line of workshops that stood on the bank of the Potomac River, near the eastern or lower end and directly opposite to(or north of) the Finishing or Turning or Bell Shop, or Item No. 8, in the southern line of shops.

Map References: Bldg. No. 9 on Map No. 4(1834) page 122; Bldg. No. 9 on Map No. 5 (1837), p. 181; Bldg. No. 12 on Map No. 6 (1837) p. 182; Bldg. No. 9 on Map No. 7 (1844), p. 183. Its former site is occupied by Bldg. No. 17,"the new Smiths Shop, on Map No. 8 (1848), p.184.

History: The large two-story brick workshop was designed and erected by Superintendent James Stubblefield and Paymaster Samuel Annin in 1808-09. Bldg. No. 4 on the 1811 inventory of buildings, its dimensions were given as 131 by 30 feet. The 1821 inventory of buildings reported the dimensions as 130 by 30 feet and the estimated value as $ 12,000.

In 1811 the first floor was occupied by 16 smiths forges, each with its own chimney. As a result the north and south slopes of the wood-shingled gable roof were pierced a row of eight chimneys. (See Photo No. 1, ca.1826 painting, page 76). The second floor was used in 1811 as the stocking shop. The shop had no water wheels or machinery.

The wooden shingle roof of the Smiths Shop was covered with slate ca. 1832 in order to reduce the danger from fire.

The Smiths or Forging Shop was used for its intended purpose from 1808 to 1847. The stocking shop activities were moved to a stocking shop with water-powered machinery, at some date between 1815 and 1827(See Item No. 9 above).

On July 2,1847, the mason Peter Litle was paid $ 110.00 " for labor taking off roof and removing old Smiths Shop."(1) The east (or south) wing of the huge new Smiths Shop was about to be erected on the former site of the old forge.(See Bldg. No. 17 on Map No. 8(1848) for the new shop, p. 184).

11. Smiths or Forging Shop, 1808 - 1845:

Location: In the northern line of workshops that stood on the bank of Potomac River, near the eastern or lower end, directly west of Item No. 10- the 1808 Smiths Shop, and opposite to(and north of) of the 1799 Armory-Boring Mill (Item No. 2) in the southern line of work shops.

Map References: Bldg. No. 8 on Map No. 4(1834), page 122; Bldg. 8 on Map No.5 (1837), page 181; Bldg. No. 11 on Map No. 6 (1837), page 182; Bldg. No. 8 on Map No. 7(1844), page 183; and the former site of this old shop is occupied by Bldg. No. 17, "the new Smiths Shop", on Map No. 8 (1848), p. 184.

History: The large two-story brick workshop with wood-shingled gable roof was designed and constructed by Superintendent James Stubblefield and Paymaster Samuel Annin in 1808-09. Bldg. No. 5 on the 1811 inventory of buildings, its dimensions were given as 123 by 30 feet. The 1821 inventory of buildings reported the dimensions as 120 by 30 feet and set the estimated value at

(1) R.G. 217, 3rd Series, Voucher 48 in File 5623. Part of a bill totalling $ 1,079.87 paid for Litle's services.

$ 10,000. The Smiths Shop did not have water wheels or machinery.

In 1811 the first floor held the forges of 16 blacksmiths. Each forge had its own chimney, with the result that the north and south slopes of the gable roof were each pierced by a row of eight chimneys. (See Photo No. 1, ca. 1826 painting, page 76). Because of the extreme shortage of housing in Harpers Ferry, the second floor of the shop, intended for use as a shop by the filers, was being utilized in 1811 as lodging rooms for the armorers.

The wood shingle roof of the Smiths or Forging Shop was recovered with slate ca. 1832 in order to reduce the danger from fire.

The shop was used as Smiths or Forging Shop from 1808 to 1845, when the old brick structure was demolished in order to clear the site for the construction of the west (or north) wing of the huge new smiths shop that was about to be erected on that site.(See Bldg. No.17 on Map No. 8(1848), page. 184 for the large new shop). The 1808 workshop was apparently demolished during July 1845 by the mason Peter Litle, as construction of the foundations for the new Smiths Shop was underway shortly thereafter. (1)

12. Smiths or Forging Shop, 1810 - 1851:

Location: In the northern line of workshops that stood on the bank of the Potomac River, near the eastern or lower end, directly west of the 1808 Smiths Shop (Item 11 above), and opposite to(and north of) 1799 Smiths Shop/ Store House and Master Armorer's Office(Item No. 3 above).

Map References: Bldg. No. 7 on Map No. 4 (1834),page 122, Bldg. No.7 on Map No.5 (1837) page 183; Bldg. No. 10 on Map No. 6, page 182; Bldg. No. 7 on Map No. 7(1844), page 183; and Bldg. No. 16-"the Old Smiths Shop" on Map No. 8(1848), page 184.

History: This large two-story brick workshop with wood shingle gable roof was designed and constructed by Superintendent James Stubblefield and Paymaster Samuel Annin in 1810 - 12. Bldg. No. 27 on the 1811 inventory of buildings, it dimensions were given as 83 by 29 feet. The 1821 inventory of buildings reported the dimensions as 80 by 30 feet and its value was estimated to be $ 6,000.

In 1811 the first floor held 10 smiths forges. Each forge had its own chimney so that the north and south slopes of the gable roof of this shop were each piereced by a row of five chimneys. (See Photo No. 1, ca. 1826 painting,

(1). R.G. 217, 3rd Series, File 2841 for the 3rd quarter of 1845. The vouchers for this quarter are missing, so that details on the demolition of the Old Smiths Shop cannot be established in detail. Peter Litle, who was constructing the stone foundations of the new shop, probably demolished the old one. On November 7,1845, Litle was paid $ 3,526.13 for building the foundations of the new shop, see File 3122, Voucher No. 17, 3rd Series.

page 76. The second floor of this shop, designed for use as a filing shop, was still under construction in October 1811.

The roof of the Smiths Shop was slated ca. 1832 in order to lessen the danger from fire.

The Smiths or Forging Shop was used for its intended purpose from 1811 to about May 1850. In his annual report for the year ending June 30, 1850, Superintendent John Symington reported: "A double annealing furnace and stack of brick work, with cast iron front, has been erected in one of the old Smiths Shops; also for the same shop, a new charring furnace (probably for leather) with cast iron cylinder..." As all the other old smith shops had been demolished by May 1849, the temporary double annealing furnace must have been installed in this 1810-12 shop. (1) The cost of these alterations was approximately $ 129.77 and were executed by the mason William Collins. (2)

This was a temporary measure until funds could be appropriated to erect a fine modern annealing shop and brass foundry on the site of the old Smiths Shop. The old Forging Shop was apparently demolished in May 1851 by the stone mason Edward Tearney, who was [illegible] to construct the foundations of the new shop. On June 30,1851, Major John Symington reported of this project: " The stone foundation for the annealing... shop is completed and ready for the brick masonry..." (3)

Fire in a Smiths Shop in 1832:

On September 15,1832, the wood shingle roof of one of the three smiths shops (Items No... 10, 11, or 12) in the northern line of workshops caught fire. The roof and interior woodwork were destroyed. The tools and brick walls, however, were saved. The structure was rebuilt in 1832-33 and the new roof covered with slate. The identity of which of the three smiths shops actually burned is not known.

13. Foundry Shop, 1808-09 to ?

Location: Unknown, but perhaps at the west(upper) end of the northern line of workshops, on the bank of the Potomac River.

Map Reference : None.

History: Probably designed and constructed by Superintendent James Stubblefield and Paymaster Samuel Annin in 1808-09 as a one and one-half story brick shop with a wood-shingle roof. Bldg. No. 13 on the 1811 inventory of buildings, the Foundry is described as a 1½ story brick shop with dimensions of 25 by 25 feet. The foundry occupied the first floor of the structure in 1811 and the second story was then being used

1. Serial No. 587, Document No. 1, p. 476.
2. R.G. 217-3rd series, file 11,000- To William Collins, $ 19.25 for labor and mortar used on new annealing furnace, May 15,1850; [illegible] voucher 24; and file 11000-voucher 52- June 26,1850- $ 110.52 to William Collins for laying 20,249 bricks, labor scaffolding & mortar= $ 101.24, and $ 9.28 for laying 2,320 brick in furnace for charring leather-". Annealing Furnace project.
3. Serial No. 611, Document No. 1, p.459. [illegible] Edward Tearney did the stone foundation work of this structure, receiving $ 2,695.77 for his efforts on September 8, 1851- R.G. 217-file 12680- Voucher 54, 3rd series.

as lodging rooms by the armorers.

No shop of this description or dimensions is carried on the 1821 inventory of buildings, so that the 1808-09 foundry appears to have been demolished prior to 1821.

14. Carpenter Shop, 1808 to ?

Location: Unknown.

Map Reference: None.

History: Probably built by Paymaster Samuel Annin about 1808, the Carpenter Shop is listed as Bldg. No. 25 on the 1810 inventory of buildings. This was described as a one-story frame structure 26 by 19 feet in size. The "Lumber Room"(item No. 15 below) stood adjacent to the Carpenter Shop in 1810-11.

The Carpenter Shop is not listed on the 1821 inventory of buildings and thus was apparently demolished prior to 1821.

15. Lumber Room, 1808 to ?

Location: Unknown.

Map References: None.

History: Probably constructed by Paymaster Samuel Annin about 1808, the Lumber Room is listed as Bldg. No. 26 on the 1810 inventory of buildings. The store house stood adjacent to the Carpenter Shop, Item No. 14 above. "The Lumber Room for Carpenter Work" in 1810 was a "low" one story frame structure 44 by 19 feet in size. The lumber room is not included in the 1821 inventory of public buildings and hence appaears to have been demolished prior to 1821.

C. Buildings Erected at the Musket Factory from 1812 to 1821:

16. Tempering Shop for Musket Barrels, 1817 -

Location: Unknown.

Map Reference: None.

History: A small tempering shop for musket barrels was erected at the Musket Factory 1817. The 1821 inventory of buildings describes the "tempering shop" as a one-story frame building, 26 by 16 feet, and set its estimated value at $ 200.00.

17. Puddling Furnace, 1818 -

Location: Unknown.

Map Reference: None.

History: A "Puddling Furnace for welding the boring and scrap iron of the Armory," built of stone, was erected at a cost of $ 130.00 in 1818. The furnace, for some reasons is not included on the 1821 inventory of buildings.

18. Annealing Furnace, 1819

Location: Unknown. but probably on the bank of the Potomac River.

Map Reference; None.

History: A brick annealing furnace constructed prior to 1819. This structure is not included on the 1821 inventory of buildings.

19. Saw Mill, 1819 - ca. 1824:

Location: On the bank of the U.S. Musket Factory Canal, exact site unknown.

Map Reference: None.

History: In 1819 the old Armory saw mill, located on the Lower Hall Island in the Shenandoah River, was turned over to Captain John H. Hall for use as a machine shop to manufacture the Hall Patent Rifle. A new saw mill for the Musket Factory was constructed on the banks of the Potomac Canal during the fall of 1819 at an approximate cost of $ 472.75. The 1821 inventory of buildings indicates that the saw mill was built of wood and stone, valued at $ 1,000, but gives no dimensions for the structure.

The new saw mill was utilized for armory purposes from 1819 to about 1824. In 1824 Superintendent James Stubblefield sold part of Virginius Island, which included a saw mill, to Lewis Wernwag for $ 8000. According to charges made by Armorer Charles Staley in 1826, Stubblefield ceased sawing lumber at the Musket Factory saw mill in 1824 and gave all of the Armory sawing business to Wernwag's mill, allegedly to help Wernwag pay off the debt on the Virginius property that he owed the Superintendent.

In July 1839, the stone foundations of the former 1819 Armory saw mill on the Potomac canal were " filled up."

20. Charcoal House, ca. 1812 - 1819:

Location : Unknown.

Map References: None.

History: At some unknown date after October 1811, Superintendent James Stubblefield had a storehouse for charcoal, probably a frame building, erected at the Musket Factory. In 1819 he reported that this decayed structure had fallen down.

21. Charcoal House, 1819 - 1828:

Location: Unknown. Because of its large size, however, this structure may have stood on the bank of the Potomac River in the northern line of workshops and about opposite to (or north of) the Stocking Shop (Item No. 9 above), which also measured 111 feet in length. (Also Photo No. 1, ca. 1826 painting, page 76).

History: Superintendent James Stubblefield erected this Charcoal House in 1819 to replace the old one (Item 21), which had fallen down. The 1821 inventory of buildings describes the store house for charcoal as a one-story wooden structure, 111 by 30 feet in size and estimated its value at $ 400. The 1819 store house was replaced, in turn, by a large new one in 1828.

22. Store House for Stone Coal, 1819 - 1826:

Location: Unknown.

Map References: None.

History: A store house for coal was erected at the Musket Factory in 1819. The 1821 inventory of buildings describes the "Stone Coal House" as a one-story wooden structure, 30 by 30 feet in size, and its value was estimated to be $ 400.00. The 1819 building was replaced by a new coal house in 1826.

23. Draw-Grinding Shop, Pre-1821 - 1826:

Location: Unknown. If it contained water-powered machinery, however, the shop would have been located on the north bank of the Musket Factory canal.

Map References: None.

History: This small shop was constructed after 1812 and prior to 1821. The 1821 inventory of buildings describes the "draw grinding shop" as a one-story wooden building and estimated its value to be $ 150.00. This shop was replaced by a new one of the same type in 1826.

24. Store House for Iron, 1821 - 1824:

Location: Unknown.

Map References: None.

History: Constructed after 1811 and prior to 1821, the 1821 inventory of buildings described the "Iron Store House" as a one-story wood and stone structure measuring 120 by 16 feet in size. The estimated value was set at $ 1,000. The old iron house was replaced by a new one in 1824 that was erected on the Lower Hall Islan

25. Proof House, ca. 1821 - 1829:

Location: Unknown.

Map References: None.

History: Apparently constructed after 1811 and prior to 1821, the 1821 inventory of buildings described the "Proof House" as a one-story building constructed of wood and stone, 14 by 12 feet in size. The value was estimated to be $ 200.00.

26, Fire Engine House, ca. 1821 -1834 :

Location: Unknown.

Map References: None.

History: A fire engine house was constructed after 1811 but prior to 1821. The 1821 inventory of buildings described the fire engine house as a two-story wooden structure, 16 and 12 feet in size. Its value was estimated to be $ 300.00. The first story housed the fire engine and the second served as lodging rooms for the armorers.

The armory purchased a new fire engine for $ 650.00 on May 29, 1822.(1) There were two fire engines and two fire engine companies in 1827. Company No. 1, with some 24 men, was stationed at the U.S. Musket Factory. Company No. 2, with some 18 men, was stationed at the U.S. Rifle Factory on the Lower Hall Island. In 1827-28 the men of the two fire companies were paid at the rate of 25 cents per month for serving in these units (2)

The first fire engine was probably sent to the Armory in 1810/.(3)

1. Record Group 217, 1st Series, File 6274, Voucher C41.
2. R.G. 217, 1st Series, File 11622, Voucher 217C for number of men and compensation of men in Company 2 in 1827; File 12579, Voucher 70B for number of men and compensation in Company No. 1, Nov. 27, 1828.
3. Paymaster Samuel Annin to Secretary of War Henry Dearborn, October 10, 1810, asking for a new fire engine. HF NHP Reel 18, Vol. 6, p. 530.

27. The Superintendent's Office, ca. 1815 - 1837:

Location: In the center of "Potomac Street" (the Musket Factory's main or central street) near the east or lower end and about opposite to (or north of) the Superintendent's 1808-09 brick residence (See Item No. 7, above).

Map References: Bldg. No. 12 (Probably) on Map No. 5 (1837), page 181; Perhaps Bldg. No. 14 on Map No. 6 (1837), page 182. The building is not shown on Map No. 4 (1834), page 122 or Map No. 7 (1844), page 183.

History The Superintendent's Office was constructed after 1811 and prior to 1817. The 1821 inventory of public buildings describes the "Superintendent's Office" as a two-story wooden building, 18 by 18 feet in size, and set the estimated value at $ 500.00.

The frame Office served as the Armory Superintendent's Office from ca. 1815 to 1832 or 1833. In 1832-33 a one-story brick dwelling house, perhaps dating from 1826 and standing on the northeast corner of Arsenal Square, fronting on Shenandoah Street, was remodelled for use as the Superintendent's new office building. Superintendent George Rust, Jr. moved to the new location, probably in 1833.

From ca. 1833 to 1837, the Superintendent's old office was utilized by Captain John H. Hall as browning shop for his Patent rifles. This required the transportation of his rifles to Musket Factory shop for browning and then their return to the Rifle Factory on the Lower Hall Island , a distance of about a mile each way.

In 1837 a new browning shop for the use of Hall was constructed at the U.S. Rifle factory on the Shenandoah in order to eliminate this travel to the Musket Factory. In 1837 the Old Office/ Browning Shop, because of its dilapidated condition, was dismantled and removed from the Musket Factory yard.

In seems probable that the old frame office was then re-erected on what later became known as Lot No. 6, Block D, Shenandoah Street, and where "Old Office", designated as "X" appears on S. Howell Brown's 1848 Map of Harper's Ferry.

D. Musket Factory Buildings erected 1822 - 1829:

28. Shop for Turning and Tempering Lock Springs, 1822:

Location: Unknown. If it had water powered machinery, then it was located on the north bank of the Musket Factory Canal.

Map References: None.

History: In 1822 a small shop for turning and tempering lock springs was built at a cost of $ 150.00. The building, one story, was probably constructed of stone.

Also erected in 1822 at a cost of $ 150.00 were three wooden sheds over the three principal water wheels of the Turning, Boring, and Stocking Shops for the purpose of "keeping stoves to prevent freezing."

An additional $ 100 was expended in 1822 for erecting a shed over the annealing furnace.

29. House for Annealing Gun Barrels, 1823-24:

Location: Unknown.

Map References: None.

History: A small "House for annealing Gun Barrels," probably built of stone, was erected in 1823 at a cost of $ 200.00. A furnace for annealing musket barrels was erected in November 1824 at a cost of $ 105.25. (1)

30. Shop for Draw Grinding, 1826:

Location: Unknown. However, if it had water-powered machinery, the shop was then located somewhere on the north bank of the musket factory canal.

Map References: None.

History: A new shop for draw grinding was constructed in 1826 at and approximate cost of $ 481.42. The two-story stone shop was 27 by 18 feet in size; it had a cellar and its walls contained about 155 perches of stone mortar wall. (See Item 23, page 263,wooden shop).

31. Store House for Coal, 1826:

Location: Unknown.

Map References: None.

History: A store house for stone coal was constructed in 1826 at a cost of $ 202.35. Probably one-story, its wall contained 295½ perches of stone. The building probably replaced the wooden stone coal house that had been erected in 1819.(See Item No. 22, page 263).

(1) R.G. 217, 1st Series, Voucher 22A, File 8693, to mason Jonah Tompkins, November 24, 1824.

32. House for Annealing and Tempering Ramrods, 1826:

Location: Unknown. But perhaps located on the bank of the Potomac.

Map References: None.

History: In 1824 $ 100.00 had been spent to construct a furnace for hardening and tempering ramrods. (1). In 1826 $ 113.00 was expended on erecting a stone building for "annealing, case-hardening, and tempering ramrods." Probably one -story, the walls of the 1826 structure contained 148 perches of stone.

33. Shop for Half-Stocking Machinery, 1827-28:

Location: On the north bank of the Musket Factory Canal for the water power necessary to drive its machinery. The shop may have been attached to the western(upper) end of the Stocking Shop (Item No. 9, page 256). (See Photo No. 1, ca. 1826 painting, page 76).

Map References : If attached to Stocking Shop, then see Bldg. No. 5 on Map No. 4(1834), p.122; Bldg. No. 5 on Map No. 6(1837) page 182; Bldg. No. 5 on Map 7(1844),page 183. If not attached to Bldg. 5, then its location is unknown.

History: The two-story brick shop for the half-stocking machinery was erected in 1827-28 at a cost of $ 2,800.00, which included $ 1,200 for the structure and $ 1,600 for the machinery. The shop had stone foundations, brick walls with some 22,667 bricks, and measured 20 by 30 feet in size. The forebay and tail race were built of stone and the shop had a water wheel to drive the machinery.

34. Watch House. 1828

Location: Unknown.

Map References: None.

History A small stone house was constructed in 1828 at a cost of $ 200.00. This "watch house" was apparently utilized by the night watchmen of the Musket Factory.

35. Store House for Charcoal, 1828 - 1845:

Location: Unknown, but perhaps on the north bank of the Potomac at the western end of the northern line of shops.

Map References: None: However, the Charcoal House(brick) erected in 1845-46

(1) R.G. 217, 1st Series, File 8693, Voucher 22A, paid to mason Jonah Tompkins on September 13, 1824. Philip Coons did the 1826 construction.

may have been built at or near the site of the 1828 store house. If this was the case, then the 1828 charcoal house would have been located as described above. See Map No. 8(1848), page 184, Blding. No. 13 "New Charcoal House,1845-46." for possible location of 1828 Charcoal House. Perhaps Bldg. No. 7 on Map No. 6(1837), page 182.

History: A large frame store house for charcoal was constructed in 1829 at a cost of $ 750.00. This building apparently stood until replaced by a brick charcoal house in 1845-46. (1)

36. Proof House, Brass Foundry, and Engine House, 1829:- 1836 Ca.)

Location: Unknown, but perhaps situated on the bank of the Potomac River.

Map References: None.

History: In 1829 a total of $ 1,500.00 was spent to construct a one-story stone structure that contained a proof house, brass foundry, and engine house, the last being used to house two fire engines. The exterior walls, 109 square yards, four feet and five inches were "trowel dashed", while the interior walls were rough coated. The walls were reported to contain 166½ perches of stone mortar wall.

This building apparently replaced the 1821 Proof House(item No. 25, page 264) and the 1821 Fire Engine House(Item No. 26, also page 264.

E.\ Check List of Shops at the Lower Hall Island Plant, 1808- 1834, that used by the Musket Factory for the Production of Muskets:

1. Mill for Heavy Grinding, with machinery for heavy grinding and three trip hammers. One story, brick, 85 by 40 feet. Erected 1809-10. Valued at $ 6,000 in 1821. Used by the Musket Factory from 1808 to November 1827, then turned over to Captain John H. Hall for making Hall rifles. Enlarged in 1827.

2. Tilt Hammer Shop(Furnace and Forges), one-story brick, 45 by 45 feet, valued at $ 4,000 in 1821. Erected in 1808-10, had two tilt hammers in 1811 and also a forging hammer in 1831. Used by the Musket Factory from 1808 to June 1831, when building turned over to Captain John H. Hall for making Hall rifles.

3. Armory Saw Mill, 1796 to 1819. Turned over to Captain Hall in 1819 for use as Hall's Machine Shop.

4. Store House for Coal, erected in 1822 at cost of $ 200.00. Turned over to Captain Hall in 1834. Probably a stone building.

5. Store House for Bar Iron, a one and one-half story stone building constructed in 1824 at a cost of $ 500.00. Building turned over to Captain Hall in 1834.

(1) Serial No. 493, Document No. 1, p. 164. Superintendent's annual report for year ending June 30, 1846. The 1829 Charcoal House apparently replaced the 1819 Charcoal House, see Item 21, p. 263.

F. Musket Factory Buildings erected 1830 - 1835:

37. Small Building Attached to Finishing Shop, 1830:

Location: For location of Finishing Shop, see Item 8, p. 255. It is not known just where the new building adjoined the shop.

Map References: Finishing Shop is Bldg. No. 2 on Map No. 4 (1834), page 122; Bldg. No. 2 on Map No.5 (1837) page 181; Bldg. No. 2 on Map No. 7 (1844), p. 183.

History: In 1830 one small building was erected and attached to the finishing or turning or Bell Shop at a cost of $ 152.00. The addition held grindstones and their machinery.

38 Scrap Iron Store House, 1830 .

Location: Unknown.

Map References: None.

History: In 1830 a small store house for scrap iron was erected at a cost of $ 43.32.

39. Hardening Furnace, 1831.

Location: Unknown.

Map Reference: None.

History: A new "Hardening Furnace" was constructed in 1831 at a cost of $ 57.41.

40. Grinding Mill, 1831 - 1850:

Location: On the north bank of the Armory Canal at the western(upper) end of the southern line of workshops.

Map References: Bldg. No. 9, "the Old Grinding Mill" on Map No. 8(1848), page 184.

History: The shop (Grinding Mill) which did the heavy grinding for the Musket Factory was located on the Lower Hall Island in the Shenandoah River from 1809 to 1827. In November of the latter year, this shop was turned over to Captain John H. Hall for use in the production of his rifles.

In 1830 Congress appropriated $ 2,500 to erect "a New Workshop", which turned out to be a grinding mill , at the Musket Factory. The grinding mill was constructed in 1831 at a cost of $ 2,438.43, exclusive of water wheel and machinery. The stone shop had stone foundations, the stone walls contained 233 perches of

stone mortar masonry, and its roof was covered with 2,970 square feet of slate. The forebay was constructed of wood and the tailrace of stone. (1).

In August 1834 a five foot reacting cast iron water wheel was installed, probably in the grinding mill, at a cost of $ 2,980.00. Total cost of the new grinding mill, 1831-34, including the structure , water wheel, and machinery was thus approximately $ 5,480.00.

The grinding mill had been constructed under the supervision of Superintendent George Rust, Jr. In 1837 the sum of $ 731.31 was expended for sinking a well and putting in a pump opposite the grinding mill. The well was was required, because of the isolated location of the shop, to furnish drinking water for the workmen in this factory.

In his estimates for the 1846-47 fiscal year Superintendent John Symington requested and Congress appropriated on August 8,1846 the sum of $ 2,500.00 to replace the decaying, wooden forebay of the Grinding Mill with a new one of stone and also the old wooden water wheel with a new one.(5)

In his annual report for the year ending June 30, 1848, Superintendent John Symington noted that "Extensive repairs have been made to the barrel welding shop (erected 1834-37) and the wheel and forebay of the grinding mill. The forebays and penstocks of these shops have been repaired - almost renewed, and the wheels repaired..." He warned that "The heavy repairs so frequently recurring to this old and worn out machinery will add considerably to the cost of the musket." (2)

In his estimates for the 1849-50 fiscal year, Major Symington requested that $ 9,730 be appropriated to replace the old Grinding Mill and several other old shops with a new "Grinding Mill, Sawmill, and Machine Shop." The justification in the estimate informed Congress that the 1831 Grinding Mill was " a makeshift structure"that could only be used "with great inconvenience and loss", and that "its floor (is below) the surface of the ground and is covered (with water) during freshets to a depth of sometimes five feet." (3)

The Old 1831 Grinding Mill was demolished during 1850, probably during the summer of that year, as construction was in full swing during the fall of 1850 on the replacement structure(the new Grinding Mill, Sawmill, and Machine Shop), which was being erected on the same site that had been occupied by the 1831 shop. (4)

1. The 1831 forebay of the Grinding Mill had been constructed of wood. An estimate dated November 30,1844, requested the sum of $ 780.50 to replace the old wooden forebay with one of hammered stonework laid in cement, see Serial No. 464, Document 43, p. 16 for this estimate.

2. Serial No. 547, Document No. 1, page 347.

3. Serial No. 538, Document No. 2, pp. 177, 118. Estimates for year July 1, 1849 to June 30, 1850.

4. R.G. 217, 3rd Serie, File 12169, Voucher No. 20, dated November 30,1850 to mason William Collins. This indicates that the stone foundations of the new shop had been finished and that brick walls were then being raised. Also see Serial No. 611, Document No.1, p.458, the annual report for the year ending June 30,1851, in which Major Symington reported the new shop as having been completed.

5. Estimate for 1846-47 in Serial No. 481, Document No. 9, pp.111,112, Item No. 11; appropriation in U.S. Statues at Large, IX, p. 69.

41. Store House for Musket Stocks, 1832 - 1849:

Location: On the bank of the Potomac River, near the western or upper end of the northern line of workshops.

Map References: Probably Bldg. No. 6 on Map No. 6, (1837), page 182; Bldg. No. 12,"Old Stock Store House", on Map No. 8(1848), page 184.

History: A new Store House for Musket Stocks was erected by Superintendent George Rust, Jr in 1832-33 at an approximate cost of $ 800.00, replacing a "decayed" structure that had been used for this same purpose. The new Stock House, probably built of stone, was about 65 by 30 feet in size. The roof was covered with slate.

A new Store House for Stocks was erected in 1846-47 and the Old (1832) Stock House was apparently demolished in 1849. (1)

42. Tilt Hammer Shop for Barrel Welding, 1834-37 - 1852:

Location: On the bank of the Potomac River, at the extreme upper or western end of the northern line of workshops.

Map References: Bldg. No. 8 on Map No. 6 (1837), p. 182; "Tilt Hammer Shop" on Map No. 9(1837), page 195; and Bldg. No. 11,"Barrel Welding and Tilt Hammer Shop," on Map No. 8 (1848), page 184.

History: From 1828 to 1832, a total of approximately $ 5,513.60 was spent constructing the stone foundations and earth embankments for a proposed new tilt hammer shop. In 1834 it was decided to erect the shop at an entirely new site(as given on maps above) and the first building site was abandoned.

The new tilt hammer shop for barrel welding was built under supervision of Superintendent George Rust, Jr. in 1834 - 1837 at an approximate cost of $ 22,750.46. Of this sum, about $ 13,500 went for construction of the structure in 1834-35 and the balance of $ 9,250 for the water wheels and machinery. This was the largest and most expensive workshop to be constructed at the Harper's Ferry Armory prior to 1841.

The Tilt Hammer Shop for Welding Barrels, perhaps 160 feet long and 40 feet wide, was a one-story building with a slate roof. The foundations and walls, of stone, contained 1,502 perches of stone mortar wall. The forebay was built of wood and the tailrace of stone. There were eight water wheels : two of wood and six of cast

(1). George W. Tacey (or Tracey) was paid $ 13.11 on August 9,1849 "for labor taking slate off roof of old stock shop, 2,622 feet.

The Old Store House for Musket Stocks, which served the Musket Factory from 1822 to ca. 1834, had been erected by Superintendent James Stubblefield on Arsenal Square in 1822 at a cost of $ 1,000.00. The wood and stone stock house stood on the east boundary line and just north of the main gate to Arsenal Square. See Map No. 4(1834), page 122 for location of 1822 Stock House.

iron. (1) One of the wooden wheels was 20 feet in diameter and the six cast iron wheels were supposed to ran at 150 revolutions per minute with eight feet of backwater.

During the years 1846 to 1848, Superintendent John Symington requested and received a total of $ 13,950.00 to rebuilt the forebays, water wheels, and machinery, and to make additions to the structure as follows:

In estimates for the 1846-47 fiscal year Major Symington asked for $ 10, 400 for work at the tilt hammer shop. $ 2,600 of this was to be used to replace its rotting wooden forebay with a new one made of cast iron and to also replace the two old wooden water wheels with new ones.(2) The balance of $ 7,800 was to be used to reconstruct the wooden hammer frames of six tilt hammers for barrel welding with stone frames. "Six wooden wheels"and their shattered flumes were to be replaced. (3) . $ 10,400 desired for these projects was appropriated on August 8, 1846. (4).

On October 10,1846, a cast-iron forebay and penstock for the tilt hammer shop was purchased from Ross Winans for $ 3,009.88. (5)

In his estimates for the 1847-48 fiscal year, Symington next asked for $ 2,700.00 "for raising the floor of the barrel-welding shop, and for replacing the tub-wheels now used for barrel-welding, by turbine wheels." He explained this work was needed because the floor "is now, in ordinary freshets, under water," thus stopping all work, and that the turbine wheels, unlike tub wheels, were "not materially affected by back water." (6). Congress appropriated the desired $ 2,700.00 on March 2, 1847. (7)

Finally, in his estimates for the 1848-49 fiscal year, Superintendent Symington requested and received on August 14, 1848, the sum of $ 850.00 "for building a room for inspecting forges barrels at the musket Factory." This was necessary he explained because "There is neither room nor light for inspecting barrels in the welding shop, consequently these barrels have to be carted down to the lower shops to be inspected, and sent back to have the cone seat welded on. This great inconvenience and expense will be avoided by having an inspecting room adjoining the barrel forging shop." (8)

1.Superintendent John Symington, in his estimates dated November 30,1844, requested an appropriation of $ 1,756.00 to rebuild the eight wooden forebays of the tilt hammer shop with ham mered stone laid in cement; also an additional $ 852.75 to reconstruct the revetment wall of the canal embankment in the rear(south side) of the workshop. Congress,however, did not provide the money for these projects at that time. Serial No. 464, Document No. 43, pp. 16 and 17.

2. Serial No. 481, Document No. 9, pp. 111, 112, Item 10 in estimates.

3. Serial No. 481, Document No. 9, pp. 111, 112, Item No. 9 in estimates.

4. U.S. Statues at Large, Vol. IX, p.69.

5. R.G. 217, 3rd Series, File 4837, Voucher No. 2.

6.Serial No. 497, Document No. 3, p. 142, Item No. 7.

The water"sometimes rises to the hearths of the forges." The high water sometimes interrupted all operations at the tilt hammer shop for 8 or 9 working days.

7. U.S. Statues at Large, IX, p. 151.

8.Serial No. 514, Document 2, pp, 110,111, item 3 for estimate; U.S. Statues at Large, IX, p. 306 for the appropriation.

In his annual report of operations for the year ending June 30, 1848, Major John Symington described the completion of these repairs as follows:

"Extensive repairs have been made to the barrel-welding shop, and to the wheel and forebay of the grinding mill(See Item No. 40, page 269).

"The forebays and penstocks of these shops have been repaired - almost renewed, and the wheels repaired. The hammer frames for welding barrels have very generally required repeated repairs. An entirely new frame for the hammer, for drawing iron and steel, has been made. The heavy repairs, so frequently recurring to this old and worn out machinery will add considerably to the cost of(producing) the musket." (9)

In the estimates for the 1849-50 fiscal year, the Ordnance Department asked for $ 17,900.00 to construct a new barrel welding, tilt hammer, and swedging shop at a new site. In justifying this large sum, Major Symington wrote:

"To replace the present barrel welding and tilt hammer shop which has all the defects, but in a greater degree, of all the other old shops, which have had to be reconstructed; being dark, and badly ventilated, with its floor so low that every freshet covers it, sometimes to the depth of 8 feet. There is also now a separate wheel and gearing for each hammer, 8 in all, 6 of which are tub wheels utterly useless when submerged; having thus lost 28 working days during the last year and 52 the year before..." (10)

Congress appropriated the money for the new tilt hammer shop. In the report of operations for the year ending June 30, 1853, the Superintendent reported: "The old (1834-37) tilt hammer shop has been pulled down, and the wheels, &c., removed; the wheel-pits, penstocks, and forebays filled up; and all made ready for building a new rolling-mill on its foundations." (11)

43 and 44. The Carpenters Shop and Machine Shop, 1834 - 1849:

Location: On the north bank of the Armory Canal at the western or upper end of the southern line of workshops: Just east of Grinding Mill.

Map Reference: Carpenters Shop is Bldg. No. 7,"Carpenters Shop -Old" on Map No. 8(1848) ,page 184.
Machine Shop is Bldg. No. 8,"Machine Shop-Old," on Map No. 8 (1848), page 184.

History: On May 14, 1834 Congress appropriated $ 4,230.69 to erect a"Carpenters and Machine Shop." The structure was apparently built as two separate one-story stone buildings with slate roofs in 1834-35. 2,640 feet of roofing, 1,729 feet of joists, and 1,729 feet of double flooring went into the shops. The exterior stone walls were also trowel-dashed.

In the estimate for the fiscal year July 1,1849 to June 30,1850 Superintendent John Symington asked for $ 9,730.00 to erect a new combined Grinding Mill, Sawmill, and Planing Mill to replace the 1831 Grinding Mill

9. Serial No. 537, Document No. 1, p.347, Item No. 3.
10. Serial No. 538, Document No. 2, pp. 117-118.
11. Serial No. 692, Document No. 1, p. 277.

and 1834 Carpenter and Machine Shops. The new large building, he explained " is necessary to replace the present make-shift structures used for these purposes with great inconvenience and loss.... The saws and turning laths are at present in the machine shop, among filers and iron workers, for want of power and a better locality elsewhere; whilst the planing machinery is equally out of position in a shed put up on the side of one of the shops, and not well secured from weather, The present structures are also much decayed, and are only kept in use by frequent repairs, to the delay of the operations of the armory..." (1)

The money for the new workshop was appropriated on March 3, 1849. In his report of operations for the year ending June 30,1849, Major Symington reported that old buildings at the Musket Factory were being torn down to clear the site for the construction of new ones. Old workshops demolished in 1849 apparently included the 1831 Grinding Mill, the 1834 Carpenters Shop , and the 1834 Machine Shop. Actual construction on the replacement structure, however, began in 1850 and was completed in 1851. (2)

The Old Carpenters and Machine Shops had been built under the supervision of Superintendent George Rust, Jr.

45. Store House for Iron and a Bin for Coal, 1834 - Ca. 1841:

Location: Uncertain, but probably in the northern line of shops, on the bank of the Potomac River. Perhaps near the eastern or lower head of the line, adjacent to the three Smiths or Forging Shops.

Map References: Either Bldg. No. 10 or 11 on Map No. 4 (1834), page 122; Probably either Bldgs. No. 10 or 11 on Map No. 5(1837), p. 181; Perhaps Bldg. No. 13 on Map, No. 6 (1837),p.182. The Store House for Iron, however, had been apparently demolished by 1841 or 1842, for its site(probable) is occupied by the New Warehouse,Bldg. No. 10 on Map No. 7(1844), p. 183.

History: From 1824 to 1834 the iron used at the Musket Factory had been stored in a Store House for Bar Iron, located at the U.S. Rifle Factory, on the Lower Hall Island in the Shenandoah, and about one-mile distant from the Musket Factory. In 1834 the old iron house was turned over to Captain John H. Hall for use in the production of his Patent Rifle and a new "Store House for Iron, Steel, and a Bin to Contain Coal" was constructed at the U.S. Musket Factory under the supervision of Superintendent George Rust, Jr., at an approximate cost of $ 1,710.15

The new store house, erected in 1834-35, had stone foundations brick walls that contained 17,664 bricks, and 20 40/100 squares of slate were used to cover its roof. There were five opening for doors and or windows.

(1) Serial No. 538, Document No. 2, p.118.
2. Serial No. 549, Document No. 1, p. 365. Annual Report for June 30,1849.

It would appear that the Store House for Iron was demolished in the fall in order to clear the site for the construction of a large two-story "warehouse for Iron, Steel, and other Supplies," 93½ by 30 feet, 10 inches in size. The new warehouse was built 1841-44 at a cost of some $ 7,200.(1)

46, Annealing Shop and Proof House, 1834 - 1850:

Location: On the banks of the Potomac River in the northern line of workshops, immediately west or above the three Smiths or Forging Shops(See items No. 10, 11, and 12, pages 258-259).

Map References: Probably Bldg. No. 6 on Map No. 4 (1834), page 122; Bldg. No. 9 on Map No. 6* (1837), page 182; Bldg. No. 6"Shop", on Map No. 7(1844), page 183; and Bldg. No. 15 "Annealing Furnace-Old," on Map No. 8(1848), page 184.

History: In requesting $ 1,872.36 to erect a new annealing shop and proof house it was explained that "The present annealing shop and proof house are so constructed as to be exposed to much danger from fire; and their location to the immediate vicinity of the workshops, might, if fire were to originate in them, involve the whole of the workshops in flames. It is designed to increase their height and to make them fire proof..."

The new one-story story stone shop was constructed in 1834-35 under the supervision of Superintendent George Rust, Jr. Its walls contained about 271 perches of stone mortar masonry and 444 square yards of the exterior walls were trowl dashed. The roof was covered with 1,143 square feet of slate.

By 1850 the Annealing Shop and Proof House was in such a ruinious condition that it was no longer safe to use. In June 1850 Major John Symington thereforehad a temporary annealing furnace constructed in the adjacent 1809-10 Smiths Shop(See Item No. 12, page 259).

In requesting $ 9,550.00 to erect a new Annealing Shop and Brass Foundry in the estimates for the 1851-52 fiscal year, Superintendent Symington explained the need for the replacement structure. writing "The old annealing shop has, from necessity been abandoned, the walls threatening to tumble down, and the floor flooded more or less, at every freshet in the river..."(2). Congress appropriated the money for the new shop on March 3, 1851. (3)

The 1834 Annealing Shop and Proof House was apparently demolished during the spring of 1851 as construction of the new shop on the same site was underway in the summer of 1851.(4)

1. Foundation of new warehouse were built at a cost of more and $ 1,833.22 in November 1841, see Record Group 217, 2nd Series, File 6718, Voucher No. 84 to George Mattingly on November 22,1841. For location of New Warehouse, see Bldg. No. 10 on Map 7 (1844), page 183; and Bldg. No. 18 on Map No. 8 (1848), page 184.
2. HF NHP Microflim Reel 20, Vol. 7, p. 694.
3. U.S. Statues at Large, Vol. IX, p.620.
4. Serial No. 611, Document No. 1, p.459, Item No. 4,Annual report for year June 30,1851- foundations for new shop were nearly complete.

In 1834 Congress appropriated a total of $ 1,821.45 to erect the following four shops and store houses and also to make an addition to the Stocking Shop, Bldg. No. 5 on Map No. 4 (1834), page 122. These edifices were apparently erected in the period 1834-36.

47 and 48: Two Houses For Fire Engines, ca. 1834-36- 1844:

Location: Unknown.

Map References: None

History: It was explained to Congress in 1834 that:

Heretofore, it has been necessary, for the want of an Engine house, to make use of one of the shops, for sheltering the Fire engines belonging to the armory. The shop now used for this purpose could be occupied advantageously in another way; and by the erection of two engine houses in more favorable situations, more speedy access might be had to the engines, in case of fire, and the security of the public property involved.

The shop then being used to house the engines would appear to have been the 1829 Proof House, Brass Foundry and Engine House(See Item No. 36, page 268).

The two new fire engine houses were apparently constructed of wood. One of these was replaced by a frame engine house in 1844 and both by a brick structure with space for two engines in 1847-48 (1) In the 1847-48 estimates for the brick Engine and Guard House described the old fire house as " a wooden shed, out of position." (2)

49 and 50: Shop for Tempering Springs, Ca. 1834-36

Shop for Buffering or Polishing Musket Barrels, ca. 1834-36:

Location: unknown. If the Polishing Shop had watered powered Machinery, however, it would have been located on the north bank of the armory canal.

The Shop for tempering springs could have been located on the bank of the Potomac in the northern line of work shops.

Map References: None.

History: It was explained to Congress in 1834 that these two small shops: "are considered necessary in order to relieve the

1. Serial No. 464, Document No. 43, p.2, Annual report of operations, Chief of Ordnance to Secretary of War, dated January 6, 1845.
2. Serial No. 497, Document No. 3, p. 142 . Estimates for 1847-48 fiscal year.

workmen in the shops where the tempering and polishing are performed, from the excessive heat, and dust, consequent on these operations.

The roof of the polishing shop for musket barrels was slated in 1841.(1) The furnace and forge in the tempering shop for springs was repaired in 1846. (2)

In the estimates for the 1848-49 fiscal year, Superintendent John Symington asked for $ 1,700.00 for building a polishing shop at the Musket Factory. He explained the need for the new building as follows:

"The present shop is too small and dark for necessary work, and some of the wheels have consequently been set up in the finishing shop(See Item No. 8 page 255); this is destructive to the machinery, from the dust made. The workmen also suffer much from the want of proper ventilation to carry off the dust." (3) The money for the new polishing shop was appropriated on August 14, 1848. (4)

The information suggests that the Old(1834) Polishing Shop may have been located adjacent to the Finishing or Bell Shop, perhaps between that shop and the Boring Mill. The Old Polishing Shop, however, is not listed on the 1848 map of the Musket Factory(See Map No. 8, page 185.

Both the small Polishing Shop and Tempering Shop for Springs appear to have been demolished by 1848.

Addition to the Stocking Shop, ca. 1834-36:(See Item No. 9, page 256, Also item No. 33, page 267).

In 1834 it was explained to Congress that the proposed addition to the Stocking Shop,Bldg. No. 5 on Map No. 4 (1834), page 122:

is intended to supply the place of an old frame building, which is useless; and being composed of combustible materials, endangers the stocking shop immediately contiguous. By the erection of this addition, sufficient room will be acquired to permit a transfer of some stockers to it, who are now employed over one of the smith's Shops; the great heat from which, during the summer months, renders their situation unhealthy.

All five structures, erected ca. 1834-36 at a cost of $ 1,821.45, appear to been small buildings. These buildings were constructed under the supervision of Superintendent George Rust, Jr.

(1) National Archives Record Group 217, 2nd Series, File 6465, 3rd quarter of 1841, Voucher No. 79, To William Bayley, $ 317.20 "for slating roofs of Supt.'s house and of buffing shop. Also Voucher No. 60, to George W. Tacey(or Tracey) for $ 11.81 for labor in helping to slate these two structures.

(2) R.G. 217. 3rd Series, File 4404, Voucher 35, to mason William Collins, $ 70.93 on September 14, 1846, for 12,230 bricks laid in forge and furnace of tempering shop.

(3). Serial No. 514, Document 2, pp.110-111, item No. 1.

(4). U.S. Statues at Large, Vol. IX, p. 306.

51. Store House for Pit Coal, 1837 - 1848:

Location: Near the new Tilt Hammer Shop for Welding Barrels that had been erected 1834-37, near the western or upper end of the Musket Factory Yard.

Map Reference: Probably structure we have labelled " Coal Bin, 1837?" on Map No. 9 (1837), page 195.

History: Congress appropriated $ 650.00 to erect coal house near the tilt hammer shop in 1836 and the structure was erected in 1837 under the supervision of Superintendent Edward Lucas,Jr.

The store house was 30 by 20 feet in size, 10 feet(one-story) high, and its stone walls contained about 80 3/4 perches of mortar masonry. The roof was probably slated. The function of the coal house was to provide coal for the tilt hammer shop.

The Coal House was probably demolished in 1848, when a new two-story stone and brick lumber house and coal bin 77 4/12 by 53 8/12 feet in size, was erected in 1848-49 on the approximate site of the 1837 store house.(See Bldg. No. 10 on Map No. 8 (1848), page 185). (1)

52. Storehouse for Condemned Component Parts of Arms, Defective Materials, and Scrap Iron, Ca. 1837 - 1838:

Location: Not Certain, but probably on the bank of the Potomac River, in the northern line of workshops and prehaps near the lower or eastern end of that row.

Map References: Perhaps Bldg. No. 13 on Map No. 6(1837), page 182; Bldg. No. 13 on Map No. 9 (18370 ,page 195; but the structure shown on the 1837 maps is missing from Map No. 7 (1844), page 183, where Bldg. No. 10,"Warehouse,erected 1841-44) occupies the site of the structure shown on the 1837 maps.

History: Congress appropriated $ 3,400.00 in 1836 to erect this store house but the building appears to have been constructed in 1837-38 under the supervision of Superintendent Edward Lucas, Jr.

The structure was to be built of stone, two stories, with slate roof, and measuring 80 by 30 feet in size. The edifice was also supposed to have been designed so that it could readily have been converted from a storehouse into a workshop, if the need for additional work space should ever arise.

The Store House for Condemned Parts is not listed on Map No. 8(1848), page 184, indicating that it was no longer extant by that date.

(1) The first story of the 1848-49 store house, built of stone, held bituminous coal and the second brick story was used to store lumber. The roof was slated.

53. The Forge for Scrap Iron, 1838-39 - 1848:

Location: Not certain, but apparently on the north bank of the Armory Canal, in the southern line of workshops, and perhaps built in the finishing/ turning/bell shop(See Item No. 8, page 255).

Map References: None, unless it was built in the Bell Shop, then see Bldg. No. 2 on Map No.4 (1834), page 122; Bldg. No. 2 on Map No. 5(18370, page 181; Bldg. No. 2 on Map No. 6 (1837),page 182; Bldg. No. 2 on Map No. 7(1844),page 183; Bldg. No. 2 on Map No. 8(1848), page 184. It should also be noted that there is no "Forge" listed on Map No. 8(1848).

History: In 1836 Congress appropriated $ 5,000.00 for erecting "a forge and fixtures for working up scrap iron into bars, and for faggoting steel." The new building was to constructed" of brick or stone, with slated roof" and built under the supervision of Superintendent Edward Lucas, Jr.

Charges against its appropriation account indicates that work was underway in 1838-39 and that stone was being acquired for use on the forge's forebay. This last evidence indicates that the forge was situated on the north bank of the armory canal. The problem that arises,however, is due to the fact that the map evidence indicates that no new structure for the forge was apparently built, 1838-1848.

One possible solution to this problem may be that no new structure was erected, but that the forges, machinry, and furnaces were installed in the Old Bell Shop. Such alterations would account for the otherwise unexplained alterations(which included the addition of a large chimney or stack) to the Bell Shop that were made after 1825 and prior to 1848. See Photo No. 2, a lithograph made ca. 1834-1837, page 129.

With regard to the large chimney on the Bell Shop, Superintendent John Symington noted in his annual report for the fiscal year ending June 30,1848 : " A large chimney stack of masonry in the bell shop, to accommodate a forge fire on each floor, has been taken down, and two portable forges, opening into sheet iron flues, substituted."(1)

As has been mentioned above, no "Forge" was listed among the Musket Factory buildings on Map No. 8(1848) page 185.

(1) Serial No. 537, Document No. 1, p. 347, Item No. 1.

MUSKET FACTORY BUILDINGS, 1798 - 1841

Year	No. of Bldgs. Standing	Value
1802	6	?
1811	11	?
1819	19	$ 74,410.00

CONSTRUCTION PROGRAM, 1822 - 1841

Years	No. Erected	Cost of New Buildings
1822- 29:	9	$ 8,541.23
1830- 35:	10	27,846.01
1836- 41:	7	22,013.91
1822-41 Total:	26	$ 58,401.17

Buildings Located on Arsenal Square that supported Musket Factory Operations:

1. Timber Shed or House and Lumber Yard, ca. 1821 - 1841. One story wood structure, 50 feet by 24 feet, valued at $ 250.00 in 1821. Located on east boundary of Arsenal Square and just south of main gate. Lumber yard located on bank of Shenandoah River on south side of square.

2. Store House for Stocks, 1822 to ca. 1834: Erected by Superintendent James Stubblefield in 1822 at a cost of $ 1,000.00. The wood and stone structure was located on the east side of the square and just north of the main gate.

3. Office of the Armory Paymaster. 1822 -1848. Pay Office, a one-story brick building, 24 by 18 feet, constructed in 1822 at a cost of $ 500.00. Building fronted on Shenandoah Street at northwest corner of square.

4. Office of the Superintendent. A one-story brick dwelling house with hipped roof, 28 by 21 feet, probably erected in 1826, was remodelled in 1832 for use as the Superintendent's Office. The structure, fronting on Shenandoah Street and located at the northeast corner of Arsenal Square, was used as the office of the Superintendent from 1832 to 1848.

BIBLOGRAPHY:

Manuscript Material:

National Archives Records, Washington, D.C.

The Confederate Army on April 19, 1861 captured the U.S. Armory at Harper's Ferry and held the place until June 15,1861. On their withdrawal on the latter date, they set fire to the U.S. Musket Factory buildings and thereby destroyed all of the original records at the Armory, which were on file in Musket Factory Bldg. No. 2, the Armory Offices. For this reason there is no collection of Harper's Ferry Armory records as such on file in the National Archives at Washington, D.C.

The originals of letters written by Harpers Ferry Armory Officers from 1798 to 1861 to the Secretary of War and Chief of Ordnance are still largely intact in the National Archives, but they are filed as they were received, when written, in the general filing systems of the Washington offical.

In 1957, Park Historians Herbert L. Kissling and Charles W. Snell, during a six week period, searched most of the central files in the National Archives for material relating to the history of the Harper's Ferry Armory from 1794 to 1869. Collected were 14,504 pages of documents on 14 reels of microfilm and 225 pages of photostated documents. Map, plans, prints and photographs in the National Archives collections relating to Harpers Ferry were also copied. Historians Kissling and Snell, in effect, thus recreated much the central Armory files that were destroyed in 1861.

The microfilm material was reproduced in the form of ex rox pages and these were placed in loose leaf notebooks. These volumes and their pages were numbered and completely cataloged and indexed according to subject and these notes placed in a master card index system.

All persons interested in performing research on the Harpers Ferry Armory history from 1794 to 1869 would therefore do well to first examine this extensive centralized collection in Harpers Ferry National Park library to collect their data, and only then, if there are still some missing links, to attempt to located these items in the general files of the National Archives, Washington, D.C.

The following National Archives Record Groups were searched and data relating to Harpers Ferry collected in 1957:

1.Records of the Bureau of the Census: Population Schedules of the Census of the United States for the Years 1810 to 1870, for the towns of Harper's Ferry, Bolivar, and Virginius Island. National Archives Record Group 29 (274 pp. on one reel of microfilm in Park Library).

2. Records of the Office of the Chief of Engineers, National Archives Record Group No. 77 (Maps and reports relating to right of way for the Winchester and Potomac Railroad, 1834).

3. Records of the National Park Service, National Archives Record Group No. 79(Maps and reports of C. &. O. and Shenandoah Canal Companies for constructing canal and locks on Shenandoah in 1803-1807.)

4. Records of the Office of the Quartermaster General, National Archives Record Group No. 92 (Civil War activities, 1861-66).

5. Records of the Adjutant General's Office, National Archives Record Group No. 94. (Civil War).

6. Records of the Office of the Secretary of War, National Archives No.107 (1794-1869).

7. Records of the Public Buildings Service, National Archives Record Group No. 121(1796-1887 records of the purchase of land for U.S. Armory use, and also of the sale of U.S. lots and houses, 1852, and 1869-1887.).

8, Records of the Office of the Judge Advocate General, National Archives Record Group No. 153.(Records and copies of deeds for the purchase of Armory lands and the sale of the same, 1796 - 1887).

9. Records of the Chief of Ordnance, National Archives Record Group No. 156. This Office or Department was responsible, under the supervision of the Secretary of War, for the operations of the Harper's Ferry Armory,1815 to 1887).

10. Records of the Office of the Inspector General, National Archives Record Group No.159. Has many inspection reports written after inspections had been made of the Harper's Ferry Armory.

Records of the U.S. Treasury Department and the U.S, General Accounting Office, The records of the Second Auditor of the Treasury, National Archives Record Group No. 217, Series Two and Three, 1817 to 1851:

This data ia comprised of thousand of pages of documents that were prepared and submitted by the Harpers Ferry Paymasters for paying wages, for purchase of materials for manufacturing arms and for construction of buildings, dams, and canals. It includes armory pay rolls and rent rolls.

This vast collection was searched by Historian Charles W. Snell for data relating to the repair and improvements of the Harper's Ferry Armory from 1817 to 1851. Records for the years 1852 to 1861 were destroyed by the National Archives staff during the 1940's in order to save space.

Historian Snell's long hand notes, taken during June 1980, have been typed up and are available for study in the Harpers Ferry National Historical Park Library in the following typescript reports:

Snell, Charles W., compiler, "Extracts from National Archives Record Group 217, Records of the U.S. Treasury Department, The Records of the Second Auditor, 1817-1841, Relating to the U.S. Armory at Harper's Ferry, during the Years 1817 to 1841 for Repairs and Improvements of the Physical Plant." Two Volumes. Vol. I, 1817-1829; and Vol. II, 1830-1841, 337 pages. (June 1980)

Snell, Charles W.,"Extracts from National Archives Record Group 217, Records of the Second Auditor, Second and Third Series, U.S. Treasury Department, relating to Expenditures for Repairs and Improvements at the U.S. Armory at Harper's Ferry, Virginia, during the Years 1842 to 1842."(Typescript, October, 1980), Volume III, 259 pp.

Published U.S. Documents:

1. American State Papers- Class V, Military Affairs(7 volumes, Washington, D.C., 1832-1850) Includes some correspondence of the Secretary of War, Ordnance Office, and Armory Superintendents. Many estimates and reports, for period 1793 to 1837.

All data relating to the U.S. Armories at Harper's Ferry, Virginia, and Springfield, Massachusetts, in these seven volumes was xeroxed by Historian Charles W. Snell in January 1980 and copies of the following report provided to the libraries of both parks:

Snell, Charles W., Compiler, "Data for Operations Histories of the United States Armories at Harper's Ferry, Virginia, and Springfield, Massachusetts, 1793 to September 30,1837, complied from American State Papers(7 volumes)," (National Capital Team, Denver Service Center, January 1980), 298 pp. in two Volumes. Vol.I(1793- 1828); Volume II, 1829-1837.)

2. The Serial Number of Public Documents of the United States published by the U.S. Congress, 1817- 1861:

This series, comprised of offical reports prepared by executive departments and submitted to Congress and also of reports and correspondence of Congress, was published annually for the U.S. Congress, beginning in 1817. About 1,100 volumes cover the years from 1817 to 1861.

Most of the data relating to the U.S. Armories at Harper's Ferry and Springfield during the years 1817-1861 was xeroxed by Historian Snell in 1979 and copies of the following report provided to the libraries of both Parks:

Snell, Charles W. Snell, compiler,"Extracts from the Public Documents of the United States relating to the Operations and History of the National Armories, 1795 -1860, at Harper's Ferry and Springfield, Published by the U.S. Congress, 1817 -1861, in its Serial Serial(National Capital Team, Denver Service Center, January 1980), 701 pages, in four Volumes. (Vol. I, 1795-1834; Vol. II, 1835-1841; Vol. III,1842-1851; and Vol. IV, 1852- 1861.

3. Serial Number of Public Document of the United States, published by the U.S. Congress, 1866- 1887 :

The Congressional Serial Number series also contains correspondence and reports, 1867-1885, relating to the sale and disposal of U.S. Armory lands at Harpers Ferry, West Virginia. This data was xeroxed by Historian Charles W. Snell and copies of the following report provided the Harpers Ferry National Historical Park Library:

Snell, Charles W., Compiler,"U.S. Documents relating to the Disposal of U.S. Armory Lands at Harper's Ferry. West Virginia, 1867-1885," Volume III, 151 pages, of the three Volume study-"The Acquisition and Disposal of Public Lands at the U.S. Armory at Harper's Ferry, Virginia, 1796 - 1885,"(National Capital Team, Denver Service Center, December 1979).

4. Benet, Stephen V. ed. and compiler, A Collection of Annual Reports and Other Important Papers, Relating to the Ordnance Department. Taken from the Records of the Chief of Ordnance, from Public Documents, and from other Sources:.(4 vols, Washington, D.C., 1878 - 1890).

A rare book; Historian Charles W. Snell xeroxed 79 pages from this set and proved the Harpers Ferry National Historical Park Library with copies in one volume in January 1980.

5. Virginia Free Press, Charles Town, Virginia, 1824-1861: A weekly newpaper publishing Jefferson County news, 1824 to 1861. Available for use in Harpers Ferry National Historical Park Library on microfilm, nine reels.

6. The Spirit of Jefferson, Charles Town , West Virginia.1865-1955: A weekly newspaper publishing Jefferson County news,1865-1955. Available for study in Harpers Ferry National Historical Park library on 34 reels of microfilm. This set acquired in 1980.

7. U.S. Statues at Large, Volumes I to XII, contain laws, resolutions, and appropriations for the Harpers Ferry Armory, 1794 to 1861.

8. Registry of Deeds for Jefferson County, County Court House, Charles Town, West Virginia. His deeds and land records from about 1800 to date.

9.Noffsinger, James P., "Harpers Ferry, West Virginia- Contributions Towards a Physical History," NPS tyepscript, Eastern Office of Design and Construction, Philadelphia, Pensylvania, November 1958), 278 pp.

Has a 54 page general narrative history of Harpers Ferry,1719-1953; pp.55- 278 comprised of 36 documents transcribed from National Archives Records and copies of 12 historical maps(parts of) and and 10 19th century photographs of Harpers Ferry.

Books:

1. Barry, Joseph, The Strange Story of Harper's Ferry (1st printed in 1903; 3rd edition, Shepherstown, W.Va. 1959).

A school teacher, Barry was born and raised at Harper's Ferry; he was a boy prior to the Civil War and his history is usuallu accurate.

2. Smith, Merritt Roe, Harpers Ferry Armory and the New Technology - The Challeneg of Change (Cornell University Press, Ithaca and London, 1977).

A excellent history of the development and production of small arms at the Harpers Ferry Armory, 1796 - 1861. Dr. Smith made very extensive use of the thousands of pages of documents collected in the Harpers Ferry National Historical Park library as well as of material in the National Archives at Washington, D.C.

NATIONAL PARK SERVICE STUDIES

A. U.S. Musket Factory:

1. Kissling, Herbert H,, "United States Musket Factory, 1796 -1835, Harpers Ferry National Monument, West Virginia,"(N.P.S. typescript, Harpers Ferry NM, W. Va., February 28, 1961), 117 pages and four maps.

2. Snell, Charles W., "A History of the Physical Plant of the U.S. Armory at Harper's Ferry, Virginia, Its Evolution and Development, 1794 to 1884. Volume I, 1794 to 1841," (NPS typescript, National Capital Team, Denver Service Center, Colorado, August 1980), 566 pages, 22 maps and 5 photos.

   General study of Musket Factory, Rifle Factory, Arsenal, Armory dwelling houses, roads, streets, powder magazines and stables,1794-1841.

3. Snell, Charles W., "A Physical History of the Plant of the United States Armory at Harper's Ferry, Virginia, 1794 to 1884. Volume II, It Evolution, Development, and Reconstruction, 1842 to 1851, Harpers Ferry National Historical Park, West Virginia," (NPS typescript, National Capital Team, Denver Service Center, Colorado, April 1981), 346 pages, 11 maps and 4 photos.

4. Snell, Charles W., "A Phyiscal History of the Plant of the U.S. Armory at Harper's Ferry, Virginia, 1794 to 1885, Volume III, 1852 to 1885, Its Reconstruction, Destruction, and Disposal," (NPS typescript, National Capital Team, Denver Service Center, Colorado, April 1981), 406 pages, 11 maps and 31 photographs.

5. Snell, Charles W., Historic Structures Report for the U.S. Musket Factory Canal and Dam on the Potomac River, Harper's Ferry Armory, Virginia, 1799 - 1884, Harpers Ferry National Historical Park, West Virginia,"(NPS typescript, National Capital Team, Denver Service Center, Colorado, April 1981), 143 pages, 8 maps, and 12 photos.

B. Baltimore and Ohio Railroad Company's Bridges, Buildings, Land, River Wall, and Trestles at Harpers Ferry:

1. Snell, Charles W., "Historic Buildings Site Survey Report for Wager Lot No. 1 & the Bridge Lot, The Baltimore & Ohio Railroad Company's Bridge and Buildings at Harpers Ferry, 1835 - 1862, Harpers Ferry National Monument, West Virginia,"(NPS typescript, Harpers Ferry NM, W. Va., September 22, 1958), 44 pages, 9 maps.

C. Wager Family and Musket Factory- Land:

1. Sullivan, Arthur L., "Historic Building Site Survey Reportfor Wager Lots No. 17 to 34(Wager Six Acre Reservation), 1782 - 1869, Harpers Ferry National Monument, West Virginia,"(NPS typescript, Harpers Ferry NM, W. Va., May 15, 1959), 90 pages. Chapters II and III.

NATIONAL PARK SERVICE STUDIES RELATING TO THE U.S. MUSKET FACTORY, HARPER'S FERRY ARMORY, VIRGINIA, 1751 - 1885:

Snell, Charles W., " A Physical History of the U.S. Musket Factory Plant, U.S. Armory at Harper's Ferry, Virginia, 1794 to 1841- Volume I: Establishment, Construction, and Development, Harpers Ferry National Historical Park, West Virginia," (NPS typescript, National Capital Team, Denver Service Center, July 1981), 315 pp., 9 maps and 2 photos.

Snell, Charles W.," A Physical History of the U. S. Musket Factory Plant, U.S. Armory at Harper's Ferry, Virginia, 1842 to 1885, Volume II: Reconstruction, Destruction, and Disposal of the U.S. Musket Factory, Harpers Ferry National Historical Park, West Virginia," (NPS Typescript, National Capital Team, Denver Service Center, July 1981), 417 pp., 33 photos, 11 maps.

Snell, Charles W. "Historic Structures and Grounds Report for the U.S. Musket Factory, U.S. Armory at Harper's Ferry, Virginia, 1859 - 61, Historical Data Section, Harpers Ferry National Historical Park, West Virginia, "(NPS Typescript, National Capital Team, Denver Service Center, August 1981), 407 pp., 15 maps and 36 photos. Historic Structure report on 24 buildings.

Snell, Charles W.," Historic Structures Report for the U.S. Musket Factory and Dam on the Potomac Riverm 1799- 1884, Harper's Ferry Armory, Virginia, Historical Data Section. Harpers Ferry National Historical Park, West Virginia,"(NPS Typescript, National Capital Team, Denver Serve Center, June 1981), 143 pp., 8 maps and 12 photos.

D. The Acquisition and Disposal of Armory Lands at Harpers Ferry, 1796 - 1885:

Snell, Charles W.,"The Acquisition and Disposal of Public Lands of the U.S. Armory at Harper's Ferry, West Virginia, 1796 - 1885,Harpers Ferry National Historical Park, West Virginia,"(N.P.S. typescript, National Capital Team, Denver Service Center, December 19790 in Three Volumes:388 pp.

Volume I: A Narrative History, 156 pages, including 10 property maps.

Volume II: Record of to Whom the United States Government issued deeds for lots and houses at Harpers Ferry for Armory land sold from 1852 to 1887. 81 pp, including 1 map.

Volume III. U.S. Documents relating to the Disposal of U.S. Armory Lands at Harper's Ferry, W. Va., 1867 - 1885, 151 pp.,including 3 maps.

APPENDIX 1

Contract for Construction of Potomac Dam in 1820

Memorandum of an agreement made & concluded this 23d day of July 1820 between John Lowstetter of Jefferson County, Virg. of the one part & James Stubblefield for & on behalf of the United States of the other part. Witnesseth that the said John Lowstetter agrees to build a wall in the Potomack /sic/ River Three hundred feet in length & not less than eight feet thick at bottom nor less than six feet thick at top & to be of the proper height to answer for turning a sufficiency of water into the Canal _ the said Lowstetter to quarry the stone & to be at every expense in laying the same & the wall to be well put up so as to answer the purpose for which it is intended _ The said Stubblefield agrees on his part to pay the said Lowstetter at the rate of three dollars for each perch when the wall shall be completed _ It is mutually understood that the stone is to be not less than from six to eight feet in length & the said Stubblefield is to be the sole judge of the quality of the work & when ever he may suppose it is not done in a workmanlike manner he may cause this agreement to be null & void as to any further obligation on the parties

Witness — John Lowstetter

Edw. Wagar — James Stubblefield

See Text, pp.84 -89.

Harpers Ferry NHP Microfilm Reel 21, Vol. 5, pp. 516-517.

Establishing the Boundary Line and Building a Wall between the U.S. Musket Factory Canal and the Wager Six Acre Reservation, 1827-29.

"MEMORANDUM OF AN AGREEMENT made the 30th of May, 1827, between the Government of the U. States of the one part, and Mrs. Catherine Wager, widow of Jn. Wager, and James Bate Wager, one of the heirs and coparciences of the said John Wager of the other part. Whereas disputed and controversies have long existed between the Wager family represented by Mrs. C. Wager, and the Officers of the Government at Harpers Ferry, respecting the proper location of the fourth and last line of the six acre lot reserved to the Wager family, to wit the boundary line along the Canal, now to put an end to the disputes and to settle and establish the said disputed line, it is agreed that it shall commence at the beginning corner on the six acre lot indicated by a pig-iron long since planted, and shall run thence by the last corner, reversed, of a survey made by John Davenport in 1796, which is recorded in the County of Jefferson, with the deed of Conveyance from the Wagers to the U. States.

The termination of said line, up the canal, is to be ascertained by the intersection of the third line of the survey aforesaid, commencing at the pig-iron on the side of the hill, and running down the hill to the canal, by the corner of said survey.

It is agreed that a permanent mark shall be made at said corner. Moreover it is agreed that the U.S. shall build a wall of a reasonable height along and up to the line on the canal, and that said wall shall be waterproof, or built with water proof cement high enough to prevent the water from leaking out of said canal and running on the land of the Wager family.

And whereas the North-western line of the Ferry landing lot reserved by the Wager family has been hitherto uncertain, it is agreed that the corner of said line shall be, and is hereby fixed, and that it shall run thro' a point designated by a gun-barrel long since planted there and along the coutheast end and just clear of the said south east end of the post-office, a store house occupied by Robert Keyes. W. Castleman Jr. the surveyor is hereby authorized and requested to place and fix on the bank of the Potomac river, where the line last mentioned runs into said river, a permanent mark - the same to be done at the expense of the U. States.

But it is understood that nothing in this agreement or compromise contained is to affect the rights of either party in regard to the disputed southwest line of the said Ferry landing lot.

In Testimony whereof Roswell Lee and James Stubblefield, Acting for the United States, and Catherine Wager and James Bate Wager have hereunto subscribed their names, and affixed their seals.

Sealed and delivered in presence of
John R. Cooke; Wm Castleman Jr., Dennis O'Byrne.
Moses T. Hunter as to Messrs Lee & Stubblefield.

The foregoing is a copy of a Deed left with the Clerk of the County Court of Jefferson for record.
Recorded at Ordnance Department and Book Page 283, July 20th 1829."

See Map No. 1, June 1827, p. 3, and text pp. 31 -32.

APPENDIX 3

Contract for Construction of Potomac Dam in 1828

Memorandum of an Agreement entered into by James Stubblefield Supt of the US Armory Harpers Ferry, Va. of the one part and Lewis Wernwag of the other part. Witnesseth That the said Lewis Wernwag convenants and agrees to construct for the U States a Dam of the following description across in part of the potomac river /viz/ The Dam is to commence at the second angle of the old dam from the head of the Armory Canal and extended thence along the course of and immediately below the old Dam 60 rods. To be 10 feet wide and filled in with stone in such a manner as to render it tight and permanent. To be constructed on the principle of the small Dam stratching from the point at the Shenandoah locks to the Island. To be constructed of sound timber and pass the Inspection of such persons as shall be appointed by the Supt. To be assured by said Lewis Wernwag for 12 months from the completion thereof, and the said Stubblefield as aforesaid agrees on his part to furnish all the Iron that may be required for said work and to pay said Wernwag for the same at the rate of $60 per rod. And it is further understood that all the Timber that has been or may be furnished said Wernwag by the U States shall be charged against him at the cost price in part payment for said work. As Witness our hands and Seals; this 4th day of April 1828.

Signed James Stubblefield (Seal)

Lewis Wernwag (Seal)*

See Text, pp. 90 - 94.

Harpers Ferry National Historical Park
Microfilm Reel 20, Vol. 3, pp.499-500.

APPENDIX No. 4

1833 Contract for the Construction of a Canal

R G 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, pp.192-195

JOHNSON GARRETT

For the Construction of a Canal

Memorandum of Agreement made and entered into this 3rd day of August, 1833 Between Johnson Garrett of the one part and George Aust Jr. Supt. U. S. Armory H. Ferry of the other part, as follows, viz:

The said Johnson Garrett promises and agrees in conformity with the annexed specification, and with such changes or alterations thereof as may be hereafter adopted, either by an engineer appointed for that purpose or by the said Superintendent, to construct and finish in a substantial and workmanlike manner, the Canal leading from the public dam to the works at Harpers Ferry Armory comprehending a distance of about nineteen hundred & eighty feet from the termination of the present Canal at the cross wall, to a point opposite the corner of the stone house occupied by Michael Crowl, the earth and stone to be procured from the land of the United States and of such quality as an engineer appointed as above shall approve.

The above mentioned engineer appointed by the Superintendent or such other person as he may depute shall from time to time not more frequently than once in each month estimate the quality and value of each species of work done pursuant to this contract at the prices contained in the annexed proposal, and also of any extra work done in consequence of the alteration of the plan of said Canal, when such alterations shall have been made under the direction of the Superintendent or engineer and shall have caused an increased expence to the contractor; and where any alteration of the plan shall have caused a saving of expence to the contractor the engineer shall make a reasonable deduction from the estimate so made for such saving of expence, and he shall determine every other question for the payment of the monthly as well as the final estimates and in like manner the decision of said engineer shall be conclusive against both parties without further appeal upon any question which may arise as to the meaning of this agreement.

Within ten days after the return of any estimate to the Superintendent, not less than four fifths of the sum appearing to be due for work performed since the preceeding estimate shall be paid by the Superintendent to the said Garrett, the balance being reserved to secure the fulfilment of this contract, no portion of which reserved money will be paid under any circumstances until this contract shall be fulfilled and the work approved by the engineer; and within thirty days after the completion and approval of the aforesaid Canal according to the terms of this Contract the final estimate shall be made and the balance due thereon shall be paid.

The work shall at all times be open to the examination, during its progress, by the Superintendent, the Engineer, or any person depated for that purpose, and the contractor shall afford every facility for such inspection.

It is mutually agreed between the parties that the work on the aforesaid Canal shall be commenced within ten days from this date and thereafter steadily prosecuted without intermission with such force as shall in the opinion of the Engineer ensure its completion by the first day of April next, at which time it shall be fully completed and delivered up. And it is further agreed that in the event the said work shall not be so commenced or prosecuted and completed, or if the contractor on being required thereto by the Engineer shall fail or refuse to increase the force employed thereon to such extent as in the opinion of the Engineer shall be necessary to ensure its completion in the stipulated time, or in case thecontractor shall disobey any orders of the Engineer or shall violate any of the express conditions of this agreement, then on a certificate of the fact by the engineer, the Superintendent aforesaid may declare this contract abandoned, and the said United States shall thereafter be exonerated from every obligation thence arising, and the reserved percentage on the contract price shall become the property of the United States to indemnify them for such breach of contract, and the Superintendent may thereafter let the said _____ or the unfinished work thereof to any other contractor in the same manner as if this contract had never been made.

The Engineer shall have the power to prescribe the manner of preparing for beginning and conducting every species of work to be done under this agreement with reference to its purpose and the durability of such work, and his instructions shall be promptly obeyed; and if he shall disapprove of the quality of any work it shall be the duty of the contractor to take down at his own expense and rebuild so much thereof as shall be disapproved of, and if the contractor shall neglect or refuse to take down work so disapproved of, the engineer shall cause the same to be done at his cost.

And it is mutually agreed between the parties to this contract that all the terms and conditions herein expressed, as well as the terms and conditions contained in the annexed specification and proposal which are deemed and taken to be a part of this contract, shall be binding upon the parties respectively according to their true intent and meaning.

In witness whereof the said parties have hereunto set their hands and seals the day and year first written.

(signed) Johnson Garret (Seal)

George Rust, Supt. (Seal)*

Harpers Ferry National Historical Park

*Photostats, Vol. 1, pp.19-21.

APPENDIX 5

Specifications For The 1833 Canal

R G 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, pp.192-195

SPECIFICATION FOR THE CONSTRUCTION OF THE CANAL FROM THE CROSS WALL TO CROWL'S HOUSE

1st. The walls and embankments to extend from the cross wall at the termination of the new Canal to point opposite Crowl's house, comprehending a distance of about nineteen hundred and eighty feet, and connecting with the present bank of the old Canal at about four hundred and twenty feet from the cross wall before mentioned, the height of the embankment to be equal to that of the new canal with a width at the top (including the inner slope wall or paving) of twelve feet, and a batter of one to one to both inner and outer slopes. The wall on the outside to be three feet at base and two at the top with a batter as before mentioned of one to one andequal to twelve feet in particular height to be made of good stone and laid in a workmanlike manner, the inner slope to be lined with a wall or paving at least one foot thick extending from the bottom to the top of the embankment, and to be at least equal to the paving in the Canal already completed. A foundation for the outerwall and inner paving shall be prepared under the instruction of an engineer appointed by the Superintendant.

The whole of the space between the outer wall and the inner paving to be filled with coarse filling except eight feet in the centre which shall be firmly and compactly puddled with good earth approved of by the engineer and made perfectly impervious to the water, the said puddling to be continued of the same width and to be made of similar materials to the top of the embankment, and whenever it may be deemed necessary by the engineer aforesaid a ditch shall be excavated for receiving the puddling of such depth as he may direct.

The wall which now supports the present embankment of the old canal is not to be removed without compensation being made for the stone.

The top of the present embankment of the old canal from the point of intersection of the new or contemplated canal with it, to be removed to the depth of at least three feet below the ordinary surface of the water in the present Canal, but as the earth thus removed will be used by the contractor in making the embankment of the new canal no compensation will be allowed for its excavation or removal.

PROPOSAL.

I hereby agree to construct and finish the canal from the termination of the present canal at the cross wall to a point opposite Crowl's house at the Harpers Ferry Armory according to the preceeding specification and in conformity with the terms and conditions of the annexed contract for the following prices, viz:

For the dry masonry of the outer wall at one dollar and twenty five cents per perch of twenty-five cubic feet.

For the embankment in which will be included the paving or wall of inner slope as well as the puddling in the centre twenty five cents per cubic yard.

The excavation for the foundation walls on the outside and the puddle ditch at the estimate of the engineer.

Signed this 5th day of August 1833.

(signed) Johnson Garrett

Original transmitted to 2nd Comptroller Nov, 7th, 1834

G. Welsh

Harpers Ferry National Historical Park

Photostats, Vol. 1, pp.22-23.

APPENDIX

Contract for Water Wheel

1834

1834 Contract for Water Wheel

R G 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, p.224

CHARLES C. STARBUCK

C. C. Starbuck proposes furnishing the Armory at Harpers Ferry with a five foot reaching water wheel with the necessary shafts, drum, frames, supports, gearing, and fixtures complete (except the Forebay and race, which are to be furnished by the Government, for the sum of Two thousand, nine hundred and eighty dollars, the whole to be made and put up in the most thorough and substantial manner, under the inspection of the Master Armorer, and finished, ready for operation by the 25th day of August next (subject to a damage of five dollars for each day exceeding that time, to be deducted from the amount of Contract.

The Superintendant to pay, after the said wheel shall have been in perfect and satisfactory operation for one month the forementioned sum of Two thousand nine hundred and eighty dollars.

Chas. C. Starbuck

Harpers Ferry Armory
13th Jany, 1834

Note: The above proposal is accepted.
Harpers Ferry Armory
29th Jany. 1834
* Geo. Kust Jr., Superintendant

P.S. This memorandum further witnesseth that it is hereby made on express condition of the foregoing contract or agreement - that no member of Congress shall be admitted to any part or share therein or to receive any profit or emolument therefrom arising. In testimony whereof the parties has this 29th Jany., 1834, set their hands and seal

Geo Kust, Superintendant (Seal)

Chas. C. Starbuck (Seal)

App. G. Bomford
July 1833*

* Photostats, Vol. 1, p.27.

1835 Contract for Five Water Wheels

R C 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, p.232

CHARLES C. STARBUCK

Memo of agreement made and entered into this 27 day of April 1835 between Benj. Moor Acting Superintendant of the United States Armory Harpers Ferry Va., acting with the consent and under direction of the Hon Lewis Cass Secretary of War, of the one part, and Charles C. Starbuck of the other part, Witnesseth:

That the said Charles C. Starbuck hereby contracts to furnish the said Benj. Moor, acting Superintendent of the Armory aforesaid with five Reacting Water Wheels complete including cast Wheels, Gates and every other Iron Fixture belonging thereto for the use of the Tilt Hammer shop now being put in operation at said Armory. Which said Reacting Wheels the said Starbuck hereby warrants to run at one hundred and fifty revolutions per minute with 8 feet back water or in other words, warrants that one half of the apertures of said Wheels shall be sufficient to drive the Tilt Hammer attached thereto at a speed of seven hundred strokes per minute with a full head of water. For each of said reacting Wheels complete as aforesaid, and operating as above warranted, the said Starbuck shall be paid by said B. Moor Acting Superintendant as aforesaid the sum of three hundred and ten dollars, and it is hereby agreed that the said C. C. Starbuck may upon the delivery of said Wheels at said Tilt Hammer Shop, receive two thirds of said price, to wit, Two hundred & six & 66/100 dollars upon each Wheel; the balance being retained until the said B. Moor acting Superintendent shall be satisfied that the said Wheels operate according to the warrantee of said Starbuck aforesaid.

It is made an express condition of this contract that no Member of Congress shall be permitted by said C. C. Starbuck to participate in the profits hereof or to be in any wise concerned herein.

In testimony whereof the parties have hereunto set their hands and seals the day and year first written

(signed) Benjm. Moor (Seal)
Acting Superintendant

Charles C. Starbuck (Seal)

Approved
Oct. 19th, 1835
(signed) Geo. Bomford
Col. of Ordnance

Original transmitted to 2nd Comptroller Oct 19th 1835 G. W.*

* Photostats, Vol. 1, pp.40-41.

APPENDIX

Contracts Related to the Tilt Hammer Shop

1834 Contract for Mason Work on Tilt Hammer Shop.

R G 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, pp.221-222

JOHNSON GARRETT

Memorandum of agreement made and entered into this 23th day of May 1834 - Between Johnson Garrett of the one part and George Hunt Jr, Superintendent of the Harpers Ferry Armory Va of the other part as follows, viz: The said Johnson Garrett hereby agrees and obligates himself to do and to execute all the Mason work to all excavation, and filling up, or embankment, in and about the tilt hammer shop now about being (built) erected at the Harpers ferry Armory, accoruing to the plan and specifications exhibited and now in the possession of the Master Armorer for the following prices to wit:

For the Morter Wall.....$1.50 per perch
" " Dry Wall..... 1.23 per perch
Plain excavation at the rate of .25 per Cubic Yard
Rock " " " " " 1.00 per Cubic Yard

and all embankment or filling at the rate of 25¢ per Cubic yard, and for such work as he the said Garrett may do, and which cannot be estimated by the rates above stated, the said Superintendent shall allow and pay unto the said Garrett such consideration as such extra work may be reasonably worth - and the said Johnson Garrett hereby promises to do the above Mason work in a workmanlike and substantial manner, and to make all the embankments required in a faithfull manner, and proper materials, and according to the plans and specifications above referred to- and in the construction of the foregoing work, the said Garrett agrees to submit to such orders and directions as may be, from time to time, given by said George Hunt Jr., Superdt. or by such person as may be appointed and permit to superintend the Construction thereof, and if such order or direction shall cause a variance from the plans aforesaid and thereby an increase of expense to the said Garrett either by the pulling down of work constructed or the putting up of work not included in specifications aforesaid and the value of such work so pulled down or put up, as the case may be, cannot be ascertained by such mode of estimation as may be agreed upon between said Garrett and the said Superintendent.

And it is hereby agreed that the work shall be commenced by the 1st day of July, 1834, and prosecuted by the said Garrett to its completion, without further interruption or delay than may be caused by the seasons. And it is agreed that as the work progresses the said Garrett shall and may receive such sums of money as he may require, provided such sums shall not exceed 4/5 of the work actually done at the time of estimation, the other fifth being retained to ensure the faithfull performance of this contract.

All measurements to be ascertained by a competant person or Engineer and if such a person or Engineer shall claim compensation for such services as he may render, such compensation shall be paid by the said Superintendent.

And it is lastly provided and expressly understood that no member of Congress shall participate in any manner in the foregoing contract nor shall receive any profit or emolument arising from same.

In witness whereof the said Johnson Garrett and George Rust Jr., Superintendant aforesaid have herewith set their hands and affixed their seals the year and day first written.

Johnson Garrett (Seal)

Geo. Rust Jr., Superintendant (Seal)

Approved July 15, 1835
Geo. Bomford
Col of Ordnance *

* Photostats, Vol. 1, pp.28-29.

1834 Contract for roofing the Tilt Hammer Shop

)R C 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, p.223

JAMES FOLEY

I hereby propose to frame the roof of the tilt hammer shop about to be put up at the Harpers Ferry Armory, and to do the other Carpenter's work of said Shop for the following prices, viz:

In framing the roof for every 100 ft.	$1.25
Sheathing	.37½
Making window frames	1.00
" door " not to exceed 4 feet	1.25
" window sash per light	.8
Venetian blinds	.37½
Batton Doors	1.25
Lintles	.12½
Last Strips	.02

and for such other Carpenter's work as may be done by me on the said shop, and for which no price is fixed and stated in the above proposition, I shall receive a suitable compensation to be determined by the prices above stated. If my proposition shall be complied with by the Superintendent of the Harpers Ferry Armory, then and in that case, I hereby obligate myself to do and to execute all the work I may do in a substantial and a workmanline manner, and I further promise and obligate myself under the penalty of a forfeiture of my Contract (if this proposition shall be accepted) that no member of Congress shall in any manner participate in the profits or execution hereof. Given under my hand this 22nd day of August 1834

James Foley

The above proposition of James Foley (Carpenter) for erecting the Joiners and Carpenter's work of the tilt hammer shops now erecting at this Armory, is hereby accepted at the prices above stated, and upon the other conditions therein set forth, and upon the last condition expressly - that no member of Congress shall be engaged directly or indirectly therein.

Geo. Bust, Superintendent (Seal)

Supt. Office
Sept. 1, 1834*

* Photostats, Vol. 1, pp.32-33.

1835 Contract for Millwright Work(Forebays, Water Wheels) for Tilt Hammer Shop.

R G 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, pp.226-227

JACOB APSEY

Memorandum of an Agreement made and entered into this 10th day of January 1835, between Jacob Apsey, Millwright, of the one part, and George Rust Jr., Superintendent of the Harpers ferry Armory of the other part as follows Viz:

That the said Jacob Apsey hereby agrees and obligates himself to construct and execute in a skillful and workmanlike manner all such Forebays, Water Wheels and such other Millwright work as the said George Rust Superintendent aforesaid may require to be constructed and done by him the said Jacob Apsey at the Tilt Hammer shop now being erected at the Harpers Ferry Armory. And for such Forebays, Water Wheels and other Millwright's work so constructed and done by the same Jacob Apsey, it is agreed by the parties contracting, that the said Jacob Apsey shall receive a price or compensation to be determined (as the price of Millwright work is usually determined throughout this section of the country) namely by the customary mode of measuring thereof and by the customary cash prices paid thereon - And in case that the said George Rust Jr. Superintendent as aforesaid shall be dissatisfied with the mode of measurement or in doubt as to the correctness of any charge made thereof, there and in that case it is hereby agreed that the work done and performed by the said Jacob Apsey shall be measured and the prices (according to the foregoing understanding) adjusted and fixed by two competent workmen who shall be Millwrights of the Counties immediately adjoining the Armory, and who shall be well acquainted with the usual modes or measurements of Millwright-work and with the customary prices paid therefore. And such umpires it is understood shall be selected in the following manner to wit

One of them to be chosen by the said George Rust Jr., Superintendent, as aforesaid, the other of them by the said Jacob Apsey and in the event of a disagreement between the said two umpires either as to the mode of measurement or as to the prices to be allowed, in that case it is provided hereby that the said umpires may and shall elect a third referee whose judgement shall be decisive of the question in dispute

And it is provided in case that the said referees shall claim a compensation for any services which they may render in the premises, it is understood, that such claim or compensation shall be mutually born by the contract parties.

It is further agreed that the said Jacob Apsey may receive, from time to time, as the work progresses, such sums of money for the work

as he may require, provided however that he shall not draw or receive more than 80 per cent of the estimated value of the work actually done and performed.

And it is lastly agreed and understood, that the foregoing Contract is made upon this express condition that no member of Congress shall by the said Jacob Apsey be admitted to any share or part or lot in said Contract nor shall receive any benefit or profit thereupon arising.

In testimony whereof the said Jacob Apsey and Geo. Rust Jr., Superintendant aforesaid, have hereunto set their hands and affixed their seals the day and year first written

Jacob Apsey Seal

George Rust Jr Superintendant Seal

Approved July 15, 1835
G. Bomford
Col. of Ordnance*

* Photostats, Vol. 1, pp.36-37.

1835 Contract for Slating Roofs of Tilt Hammer Shop and Carpenter and Machine Shops.

R C 156 OFFICE CHIEF OF ORDNANCE
CONTRACT BOOK NO. 13, p.220

WILLIAM BAYLEY

This agreement made this 10 day of January 1835 between William Bayley of the one part, and George Rust Jr. Superintendent of the United State Armory Harpers Ferry Va., acting with the consent and under the direction of the Hon. Lewis Cass Secretary of War of the other part. Witnesseth:

1. That the said William Bayley having contracted to slate in a workmanlike and substantial manner the roofs of the "Carpenter's and Machine Shops" and of the tilt Hammer shops building now being erected at this Armory, he the said William Bayley furnishing the slate (American) and all materials required in the premises for which slating is done by the said William Bayley, the said George Rust as Superintendent shall pay him the said William Bayley at the rate of nine dollars for every hundred feet thereof; the quantity of slating being ascertained by the mode of measurement usually adopted by Slaters

2. and lastly That no member of Congress shall be admitted by the said William Bayley to any share or part of this agreement or Contract or to any profit thereupon arising - In testimony whereof the parties aforesaid have hereunto set their hands and affixed their seal the day and year as first written.

Wm. Bayley (Seal)

Geo. Rust Jr. Superintendent (Seal)

Approved
C. Bomford*

* Photostats, Vol. 1, p.38.

APPENDIX NO. 12

November 5, 1838 Agreement and Grant of Right of Way through the U.S. Musket Factory Grounds at Harper's Ferry, Virginia, by the Secretary of War to the Baltimorr and Ohio Railroad Company.

National Archives, Washington, D. C. RG 121 Public Buildings Service, Harpers Ferry Case No. 154. (ms) (Copy dated 30 September 1873, Washington, D. C., of an Agreement between J.R. Poinsett, Secretary of War and Louis McLane, president of the B.&O. Company dated 5 November 1838) 13 pp.

Copied by James P. Noffsinger(1958), see "Harpers Ferry, West Virginia, Contributions Towards a Physical History," pp. 128 -134.

„UNITED STATES /Seal/ OF AMERICA

War Department
Washington City September 30th 1873

Pursuant to the Act of Congress of the 22nd February 1849, I H. F. Crosby Chief Clerk of the war Department in the absence of the Secretary of war, do hereby certify that the annexed document and chart have been truly copied from the originals on file in the Office of the Chief of Ordinance of

This department

/Seal of the Treasury Department U. S./

In witness whereof I have hereunto set my hand and caused the seal of the War Department to be affixed on the day and year first above written.

/signed/ H. F. Crosby
Chief Clerk

In the absence of the Secretary of War

/2/

Agreement:

The following agreement contains the terms and conditions upon which the Baltimore and Ohio Railroad Company shall be, and they are hereby, premitted /sic./ to construct that part of the main stem of the Baltimore and Ohio Railroad which is proposed to be constructed westward from the present viaduct at Harper's Ferry along and through the property of the United States at that place.

They have laid down two routes for the said main stem which are designated in the drawing and plan annexed hereto as a part hereof and lettered A. and B respectively, the description of which is as follows:-

The route A leaves the Railroad viaduct at or near second pier from the Virginia shore and turns to the right up the Potomac until it acquires a direction parallel or nearly so to the new

river wall now being erected by the United States on the river side of the northern row of work shops belonging to the musket armory.

The outside of this wall is about forty feet from the river front of said workshop and its top will when finished, be about

[3]

fourteen or fifteen feet above low water in the river the space between the wall and the shops being filled up and graded as a street. The route for the Railroad having reached the United States property at the lower or eastern end of the wall just mentioned passes up the river on the outside of that wall with a view to the construction of an additional wall in the river parallel to the United States wall and about twenty feet therefrom: this additional wall to be built by the company of such a height as may be deemed necessary to guard against danger from high water to be superstructure that may be placed upon the wall: the United States wall being also raised by the company to such a height as may be deemed necessary for the same purpose: the part so raised not extending inwards from the outer face of the wall at its top more than five feet: the space between the two walls to be left open throughout -- for the passage of the water of the river: the road to be so constructed opposite the tilt hammer shop as to leave a clear space of twenty feet between the road and the river front of the shop. Should the construction of the road be found to make the tilt hammer shop

[4]

inconveniently dark, the railroad company shall make such changes in the manner of lighting the building as the Secretary of War may require so as to put it into as good a condition in this respect as it is in at present. The entrance of the water of the river into the space between the walls above mentioned and its excit [sic.] therefrom to be provided for by proper openings in the outer wall. The route after passing the tilt hammer shop ascends the river along the outer bank of the United States canal by a solid embankment and wall: the embankment of the railroad to be supported on the river side by a new wall to be founded on the bed of the river, the said embankment covering the present bank of the canal so as to have the benefit of it: if desired, in diminishing the quantity of earth and other materials to be supplied for the formation of the road bed. When the route reaches the head gates of the canal it crosses the canal upon an oblique line by a bridge with a wooden superstruction of two spans of about one hundred feet each, the pier of the bridge being in a line with the pier of the head gates

[5]

and consisting of an extension of the same eastwardly, and the abutments of the bridge being so far apart as to embrace the entire present width of the canal and also a sufficient space on the southern side of the channel by which the river enters the canal just above the head gates to allow of the passage of the proposed couty road under the railroad along the inner margin of the channel and near the level of the water: the elevation of the said road being made sufficient at this point to give it a clear height of at least twelve feet above the county road. The route passes along the two precipitous points of rock immediately above the head gates and subsequently, pursues the Virginia shore of the Potomac towards Elk Branch without interference with the intended location of the county road.

Route B. is identical with route A. to a point west of the tilt hammer shop, and east of the present cross wall where it divergas from the route A. into the river for the purpose of obtaining a suitable curvature to cross the United States canal at or near the said cross wall as represented in the drawing and then

[6]

returning southwardly crosses the route A. and the said canal at or near the said cross wall to the hillside on the southern margin of the canal; the grade of the road being so elevated as to give a clear hight /sic./ at least twelve feet above the present of the water in the canal and over the county road as it shall be located along the inner margin of the canal. The railroad after so crossing the canal and country road pursues the hillside upwards to the head gates and thier /sic./ falls into route A.

The superstructions for the support of the railway upon the parallel walls above described on route A. to consist of wooden tressels /sic./ or pillars of brick stone or iron, as the company may prefer: the posts or pillars to be placed at least fifteen apart from centre to centre lengthwise of the road and to be not more than eighteen inches in diameter; the supports to stand in two parallel lines one upon the Government wall raised as above mentioned and the other upon the parallel wall built by the railroad Company.

The option is given to the said

[7]

company to take either of the routes above indicated, provided, however, that should the United States pay to the said company the difference between the cost of constructing the route "A", and the route "B" to be ascertained by a careful survey before commencing the construction of the road, then the said company shall take the route "A" and construct their road thereon. And in case the Secretary of War should require it the wall to be built by the said company above the tilt hammer shop shall be solid and sufficiently puddled to prevent breakage from the canal, so as to make it serve not only as the support of the said railroad but as the river wall of the embankment of said canal, the said company in this event having the privilege of using the materials of the present [sic.] wall as far as may be done without endangering the canal.

In the construction of the river wall below or east of the tilt hammer shop by the said company, there shall be left sufficient openings opposite each tail race from the water wheels of the armory

[8]

to facilitate the discharge of the water therefrom and as auxiliary to the vent between the two parallel walls aforesaid.

The wate[r] power privilege of the United States shall not be injured or obstructed, but a free passage shall be left for the water from the channel or the river near Striders warehouse above the public dam and at all other places and points specified and reserved between such warehouse and the falls immediately below the viaduct.

Should the said company desire to take materials from the ground belonging to the 'United States' they shall be permitted to do so free of expense at such places as may be disignated [sic.] by the superintendant [sic.] of the Armory or premitted [sic.] by the Secretary of War.

The road through the United States property shall be constructed at the minimum elevation not exceeding the hight [sic.] of the present viaduct as far as the tilt hammer shop, and the parapet wall disignated [sic.] on the drawing shall be constructed of good mortar masonery.

The said company shall allow the

[9]

United States to castruct and keep up forever a depot with suitable tracks switches and turnabouts to be connected with the said road and the second story of a warehouse proposed to be erected by the United States.

Should the said company be required by the Secretary of War so to do, they shall remove at thier [sic] own expense two wooden buildings marked 'x' and 'v' on the drawing from thhr [sic] present position to such place as the Secretary of War may direct.

The tressel [sic] work of the said road shall be terminated west of the tilt hammer shop at the point marked 'B' on the drawings, and the said company shall, if required by the Secretary of War construct, opposite, the waste way, a culvert to facilitate the escape of surplus water and the drainage of the canal.

There shall be left at the cross wall aforesaid a sufficient space for the site of a saw mill in reference to the future erection of which the said company shall construct a culvert suitable for a waste way and tail race for the accommodation of said mill.

In the event of the selection of the

[10]

line 'B' the said company shall fill up the space between that line and the canal wall from the point where the line diverges from the wall to that where it again intersects the wall so as to render the reconstruction or repairs of the wall unnecessary.

The said company shall locate and execute all the parts of thier [sic] work in such manner as shall cause the least danger or injury to the United States property and any practicable alternation consistent with the proper and judicious location and construction of the said road, that may enhance the value of the property of the United States and that shall be required by the Secretary of War shall be made by the said company the additional expense thereof being paid by the United States.

In locating and constructing the said road particularly the walls, abutments and piers, at and near the present viaduct and the eastern boundary of the property of the United States, the said company shall locate and construct the same so as to produce the least possible dimination [sic] in the width of the

[11]

river consistant [sic] with the security of the said walls,

abutments, and piers.

In the construction of those portions of the said road between the points indicated on the drawings at 'K' and 'L' the superintendent [sic.] of the Armory may exercise such supervision and control as may be necessary to prevent the filling up or obstruction of the canal bed of the river, and site for the county road.

In the use of the road authority to construct which along and over the property of the United States is hereby conceded on the terms herein set forth, it is expressly, stipulated that the cars of the said company shall not be left standing on the track in front of the work shops of the Armory so as to obtruct the light and air.

It is further stipulated that should the said company deem it their interest to use wood instead of stone coal as the fuel of thier [sic.] engines and damage should be done thereby to the property of the United States, the said company will become the insurers, and will be answerable and responsible for the same.

In testimony whereof and for the

[12]

Purpose of granting to the said company the privileges aforesaid upon the terms aforesaid. Joel R. Poinsett, Secretary of War of the United States hath hereto set his hand and for the purpose of signifying the assent of the said company to the said terms and binding them to the fullfilment [sic.] thereof Louis McLane the president of the said company hath hereto set his hand and caused the corporate seal of the said company to be affixed hereunto.

Dated this fifth day of November in the year eighteen hundred and thirty-eight.

J. R. Poinsett

Louis McLane

[SEAL]

[BALTIMORE
AND
Ohio R.R.]

Witness to signature of Louis McLane
Jno H. B. Latrobe

Witness to signature of J. R. Poinsett
Jno. T. Cochrane "

United States of America)
) S. S.
District of West Virginia)
)

I, Jasper G. Moore, Clerk of the District Court of the United States for the District of West Virginia, do certify that the foregoing is a true copy of the record in the case of the United States of America & others against the Baltimore & Ohio Rail Road, Company, lately depending in said Court at Wheeling in said District, Except the Evidence in said cause and the Photographic Map used at the sale of the said Harpers Ferry property.

In testimony whereof I hereto set my hand and the Seal of said District

Court at Wheeling in said District

this 8th day of May A.D. 1876

and in the 100th year of the Independence of

the United States of America.

Jasper G. Moore, Clerk

D.C. U.S D. W.Va.

Appendix 13

Appropriations for Construction and Repairs at the U.S. Armory at Harper's Ferry, Virginia, 1830- 1841

Objects of Appropriations	U.S Statues at Large	Date of Approp.	Amounts
1. Extending walls and embankments which convey the water from the Potomac River to the works	4 Stat.,424	5/31/30	$ 9,300.00
2. Erecting a forging shop, tilt hammerer, and new workshop	4 Stat.424	5/31/30	6,500.00
3. Erection of 10 additional dwelling houses.....	4 Stat.,424	5/31/30	10,000.00
4. Slating roofs of present workshops.....	4 Stat.424	5/31/30	3,200.00
			$ 29,000.00
5. Further extension and completion of the walls and embankments for conveying water to works	4 Stat.467	3/2/31	7,500.00
6. for 1832.....			0
7. for erection of 12 additional dwelling houses for workmen...	4 Stat.641	3/2/33	$ 8,600.00
8. Repairs and extension of the public dam on the Potomac River from which the supply of water is obtained for the works.....	4 Stat., 642	3/2/33	5,000.00
9. Enlargement of the canal supplying the water-power from the Potomac Dam to the public works	4 Stat. 642	3/2/33	13,495.00
10. Repairing the walls of 4 workshops	4 Stat. 642.	3/2/33	1,500.00
11. Constructing 3 new water-wheels and the machinery in the boring, turning and stocking shops, and sinking flumes	4 Stat 642.	3/2/33	8,400.00
12. Completing the forging shop, tilt hammer, and new workshop.....	4 Stat 642.	3/2/33	13,300.00
			49,695.00
13. Purchase of right to the water power on the Shenandoah River for the use of the U.S. Rifle factory.....	4 Stat.	3/2/33	$ 4,600.00
Total 1833	642		$ 54,895.00

Objects of Appropriations 1834 - 1841	U.S. STATUE AT LARGE	DATES Approp.	AMOUNT
14. Repairing dam and removing obstructions in way of supplying water to Rifle Factory on the Shenandoah River	4 Stat.,675	5/14/34	$ 2,000.00
15. Completion of the machinery in the 3 shops for turning, boring, and stocking muskets; the completion of the canal furnishing the water-power; erecting an annealing shop and proof housem erecting 2 shops for tempering springs and polishing barrels, erecting 2 engine houses; making addition to stocking shop and for erecting a carpenter's and machine shop.	4 Stat.675	5/14/34	36,114.86
16. Erecting storehouses for pit coal and iron, repairing paymaster's and clerks' quarters, constructing a river wall, sinking 3 wells on Camp Hill, grading and paving the open spaces between the public shops, and for painting some of the public buildings.	4/Stat.675	5/14/34	8,589.87
			$ 46,704.73
17. Completing the canal from the public dam across the Potomac to the works at the armory	4/Stat.680	6/19/34	3,378.27
			$ 50.083.00
18. for Repair and Improvements in 1835	.....	.....	0
19. For construction and repair at National Armory at Harper's Ferry	5/Stat.77	7/2/36	77,897.00
20: Rifle Factory at Harper's Ferry.....	5/Stat.149	3/1/37	8,569.00
21. Constructing a river-wall, making embankments to same; arching, stone walling, repairing the embankments of the new canal, and for completing the tilt hammer shop at Harper's Ferry Armory	5/Stat.149	3/1/37	53,743.00
			$ 62,312.00
22. Procuring new machinery for the Harper's Ferry Armory.....	5/ Stat.267	7/7/38	$ 20,000.00
23. For Repair and Improvements in 1839	.....	.....	0
24. For repairs and improvements at Harper's Ferry Armory.....	5/Stat.406	7/20/40	50,000.00
25. Repairs and improvements and new machinery at Harper's Ferry Armory	5/Stat.434	3/3/41	$ 38,000.00