GOFISH

VOLUME 14/NUMBER 5 SEPTEMBER/OCTOBER 1970

Pollution Prevention Kit

In 1899 the United States Congress passed a Refuse Act which prohibits anyone from depositing any refuse matter of any kind in the Nation's navigable waters or any tributary to such waters unless he first has obtained a permit to do so. The Act is strong; it also prohibits anyone from placing on the bank of any navigable waterway or tributary any material which could be washed into a waterway by high water or by storms or floods. The term "refuse" has been interpreted by the Supreme Court to include all foreign substances and pollutants, including solids, chemicals, oils, and other liquid pollutants.

Congressman Henry S. Reuss (Wis.) is using this Act to help prevent further degradation of our Nation's waters. He is chairman of the Conservation and Natural Resources Subcommittee of the House Committee on Government Operations, and his group has gotten together a kit for "citizens interested in preventing pollution and enhancing the quality of this Nation's waters through citizen action aiding enforcement of the 1899 Refuse Act."

Included in the kit are the House Report, 91-917, "Our Waters and Wetlands: How the Corps of Engineers Can Help Prevent Their Destruction and Pollution," issued by the House Committee on Government Operations, March 18, 1970; the applicable provisions of the 1899 Refuse Act; and outline of how the citizen can take steps to push enforcement of the Act and what he must do to make a case against a violator; a list of the Corps of Engineers offices, and a list of the U.S. Attorney offices.

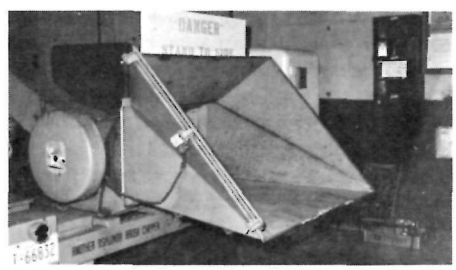
The material may be obtained from the Conservation and Natural Resources Subcommittee of the Committee on Government Operations, Rayburn House Office Building, Rm. B-349-C, Washington, D.C. 20515. The Wetlands report is also for sale (15 cents) by the U.S. Government Printing Office, Washington, D.C. 20402.

BRUSH CHIPPER SAFETY DEVICE

Consensus of opinion on the Blue Ridge Parkway seems to be that the brush chipper is the most dangerous piece of equipment in use there. Construction & Maintenance Representative Harold J. Stout and Maintenanceman Roland Wright have designed and constructed a device to reduce the hazard.

A safety cut-off switch is mounted on the hopper in a place where the operator could automatically grasp a handle, if he were to fall or be pulled into a dangerous position by the brush or material being chipped. (See photographs.) A safety handle is attached to a switch in such a way that when the handle is lifted up, the power is cut off (the direction it would be pulled if the operator were to grasp it from a position in front of the hopper).

To make this device, use two 5/8" round steel rods, braced on each end and in the center. The safety handle is hinged to the left side of the hopper, and stablizer bolts are mounted on each end of the handle and in the center, with jam nuts spaced 1/4" apart, allowing the safety handle to lift 1/4" before cutting the unit off. A safety pull-type switch is fastened to the



center bolt of the handle, and as the handle is lifted by the operator, the switch is placed in an off position, stopping the chipper.

The following materials were used: 12 feet of No. 12 ignition wire, 12 feet of 1/2" copper pipe and fittings, weatherproof metal receptacle and cover, pull-type switch, 7 feet of 5/8" round mold steel rod. Cost for materials and labor was just under $20.

CAMPER AND TRAILER HAZARDS

A man and his wife closed all doors, windows, and vents of their trailer and retired for the night. The next morning the man struck a match to light the stove and the camper-trailer instantly burst into flames. Both were hospitalized in serious condition; the woman died two weeks later.

A trailer owner, having been traced through many states to Mexico by his State Health department which was tracking down a mechanical killer, reported having been overcome twice without knowing the cause—carbon monoxide.

Most trailers and campers are equipped with liquified petroleum (LP) gas, a fuel that is invisible, nontoxic, and heavier than air. It is extremely flammable under a wide range of conditions. Its unique property is that it can be easily changed back and forth from a liquid to a gas by the application of pressure and can be delivered in concentrated liquid form in cylinders. In the liquid state, it can be stored and delivered more conveniently and at less expense than in the gaseous state. This, then is why it is used extensively today, especially in travel-trailers. Another unique aspect is that it supplies 5 to 6 times as much heat as natural gas. Its role as a fuel for outdoor living is exciting, but education of the public about its dangers is urgently necessary.

Currently there are about 1.3 million trailer and camper units of all types on the road, and in the next 10 years the number is likely to reach 2.6 million. More and more inexperienced families are taking camping vacations and unknowingly subjecting themselves to new environmental hazards.

Officials long concerned with health conditions in home and work environments have been alerted to this growing hazard on wheels and are meeting the challenge with positive action. The hazards of fire, explosion, and carbon monoxide poisoning related to the use of LP are not new; they have merely become mobile.

An alert sanitarian discovered that a heater specifically designed for residential use, and which had been given the AGA seal of approval for this use, was being installed by one manufacturer in travel-trailers, an environment for which it

Cont'd. to page 34

(Continued from page 33)

Camper and Trailer Hazards

was not designed. A call went out to state and local health departments for their assistance. Every owner of a trailer so equipped was located and alerted to the hazards.

Let's look at the circumstances involved in the case of the fatal trailer fire mentioned above. All openings were closed and the trailer was reasonably airtight. The husband, who survived, stated that he had detected no telltale odor of LP gas. (In none of the cases investigated by the HEW Denver injury-study unit had any victim detected the telltale odor of mercaptan in LP gas.)

In another incident, the circumstances were the same except that the ceiling vent had been left open all night. Both husband and wife were hospitalized with first and second degree burns resulting from the explosion and fire the next morning. Normally the man turned the gas off at the outside control valve before retiring. The night before the explosion he did not do this. He thought that any leaking gas would be vented through the ceiling opening. He did not realize that LP gas is heavier than air and that mobile homes and trailers are extremely airtight. Although he was sleeping about two feet above the floor, he did not smell any telltale odor.

Investigation showed that gas leaking from a pipe leading from the container had accumulated in a small lower closet. In the enclosure it was found that the connection at the cylinder was leaking and that the normal vibrations of driving probably caused development of the leak. Also, vents in the enclosure were not adequate to allow a free exchange of air and there was no caulking around the aperture leading into it. The Denver unit found that United States of America Standards (USASI) calling for certain facilities or mechanisms for securing the LP tank and for caulking or gromets had not been met.

Carbon monoxide (CO, which occurs when any fuel is burned under less than ideal conditions) is often termed the "silent killer." It is such a sneak that it frequently overcomes persons who are awake, alert, and healthy.

In recent studies supported by the HEW Injury Control Program to determine the extent of emission of CO in travel-trailers, the focus was on those of 16 feet or less and pickup-mounted camper units. Testing sites were chosen to provide a sample of campgrounds that was representative as to facilities, attractions, altitudes, size, and location, in order to get a cross section of users—the experienced, the casual, and the first-time. Late August was chosen for the survey period, the time when there would probably be large numbers of various types of users in the parks.

A Mine Safety Appliance dry bulb sampler was used. It is relatively inexpensive (about $80), reliable, and easy to use. One CO determination costs about 50 cents. The investigator, an experienced camper, using a 10-foot over-the-cab, slide-in camper, stayed in each campground surveyed. Approaching the visitors as one camper to another he explained why the interview was being conducted and, after an informal questioning, checked the gas line connections and requested permission to return at the time of the next meal preparation. The return visit gave opportunity to observe the occupants for a longer period and to take the sample under normal use. A 10-minute delay before taking the sample avoided dilution of the air caused by entry. All tests were taken about 4 feet above floor level in the eating area. If the first sample proved positive, a second was taken in the same area, and a third sample was taken in the sleeping area if the first two were positive.

It was found that most travel-trailer LP gas containers were mounted on the tongue, while, on the pickups, fuel containers were mounted on the rear bumper or in an enclosure in the side of the camper. When the container was in an enclosed box, air vents were normally located at the top of the container door. Since LP gas is heavier than air, this type of venting presents an additional hazard not only in the enclosure, but also in the camper unit. Safety standards require bottom venting of a specific size.

Of the 84 travel-trailers and 36 pickup-mounted campers inspected for posible carbon monoxide (CO) and LP gas hazards, 10 trailers and 18 campers showed traces of CO of 10 p.p.m. or more. Of these, five trailers and 11 campers were found to have CO levels in excess of 50 p.p.m. (permissable level in industry for an 8-hour period). Remember that exposure in camping situations may well exceed 8 hours, causing cumulative effects of CO to increase the threat to life.

Design deficiencies in the vehicles tested in this study fell into two categories.

1. Controls on stoves and gas lights could be inadvertently left open.
2. Location and design of vents on fuel tank enclosures and within trailers did not provide adequate safety.

Human factors included the following:

1. Almost all stoves had improperly adjusted burners as made evident by a lazy, yellow flame.
2. Overcrowding (four or more persons eating and sleeping in less than 700 cubic feet of space), with inadequate ventilation.
3. Loose gas line fittings resulting probably from road vibrations. In many instances these are so located that periodic examination is almost impossible.
4. Inadequate understanding of hazardous environmental situations, compounded by lack of preventive maintenance.

In another survey a local health department investigated CO levels in cars, school buses, and pickup campers. First tests made on the department's own air-conditioned cars showed a range from negligible to 75 p.p.m. for air-conditioned cars as compared with negligible to 30 p.p.m. for cars not air-conditioned. For air-conditioned cars with motor idling the average jumped to about 150 p.p.m.

About the time of this study, a newspaper advertisement offered two models of an inexpensive, unvented room heater for use with natural or LP gas. Knowing that people often make innovations in camping units and that a heater of this type might be considered for use with LP gas, it was decided to test the unit in a pickup camper. The initial test showed readings from 0 to 25 p.p.m. A second test with one additional item, a small LP gas-fired lamp, also in use gave readings from less than 5 p.p.m. upon entering the camper to 125 p.p.m. 3 hours later. An additional test, using all appliances, showed a reading of 200 p.p.m. in about 2 hours. At this reading, if a person raised his head to the level of the heat, his eyes and nostrils burned uncomfortably.

As a result of the test findings, a publicity campaign was undertaken to encourage camper owners to contact the health department and obtain a check of their camping unit for CO hazards. Publicity included newspaper advertisements, radio broadcasts, and letters to owners.

Forty-two pickup campers were inspected and each appliance was individually tested, with the following results.

1. Stoves varied from negligible to 75 p.p.m.
2. LP gas lamps ranged from negligible to 150 p.p.m., with an average of 45 p.p.m. Of 4 makes of lamps tested, 1 had a mean reading of 65 p.p.m. Two lamps tested at 100 p.p.m.
3. Refrigerators ranged from negligible to 40 p.p.m.
4. Heaters from negligible to 30 p.p.m.

The CO determinations revealed by these studies are indicative of what is happening with increased frequency throughout the nation, and indicate a need to direct concern and action toward the ever increasing nonfatal episodes of CO poisoning. Deaths from CO poisoning have not yet shown a dramatic increase, but continued increase in use of trailers and campers may ultimately result in a significant upward trend of fatal CO episodes. Subacute poisoning may occur frequently with adverse effects upon the camper's behavior in other activities. Exposure to 100 p.p.m. of CO prior to driving, fishing, or hunting could conceivably cause less than optimum performance and result in a serious ac-

cident. Continued exposure to sublethal levels can cause vague symptoms which are unpleasant and could be confusing to a physician if medical advice were sought.

Recommendations made to local health departments based on an understanding of the problem and findings of the studies, include as the first one—

> Work with park and campground operators, travel-trailer equipment dealers and fuel supply dealers to develop a broad-based educational program.

Other recommendations to the health department include:

> Use of mass media to alert the public to the dangers and means of preventing death or damage to health;

> informing the medical community of the incidence and probable increase and recalling for them the signs and symptoms of CO poisoning;

> establishment of a travel-trailer CO inspection program;

> making random spot check for CO in homes, institutions, places of public occupancy, and vehicles.

Park personnel can answer the urgent call to action on this serious and growing hazard by publicizing in their areas the dangers of explosion and fire from LP gas and the potential damage to health, and even the danger of death, from CO poisoning. They can call upon local health departments for facts to be used in their own efforts to alert campers to the dangers and also offer cooperation in programs of health departments.

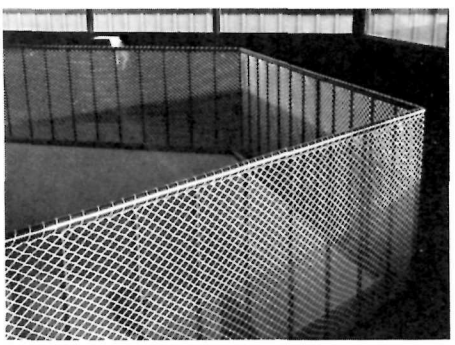
Information in this article was gleaned from a paper by Floyd B. Oglesbay, Jr., and John L. Morgan of the Consumer Protection and Environmental Health Service, Public Health Service, U.S. Department of Health, Education, and Welfare, which was presented at the 33rd Annual Educational Conference, National Association of Sanitarians in June 1969.

FISH NET BECOMES SAFETY NET

Province Lands Visitor Center, Cape Cod National Seashore, was opened in April 1969. On opening day and the day following, nearly serious accidents occurred.

There is in the Center a spiral staircase leading to a balcony, see photo. The spacing between the vertical rails is 8 1/2 inches, the distance from the balcony to the lobby floor is 14 1/2 feet, and the floors are concrete.

On that first day, the young son of an employee slipped through the balcony railing, but caught himself and squeezed back through to safety. The very next day a visitor's infant, left unattended by his parents, crawled through the railing and was hanging 14 1/2 feet above that concrete lobby floor when an alert employee noticed him and quickly notified the parents. The lobby floor at that time was not carpeted. This was certainly a situation with a high potential for serious injury and expensive tort claims.



District Ranger Richard N. Strange found a solution which not only eliminated the safety hazard but was in perfect keeping with the decor theme of the center, which is fishing. Fish net fastened to the balcony and stair railings fits right in with the theme and even adds to the attractiveness of the building.

NOISE STOPPERS FOR TRASH CONTAINERS

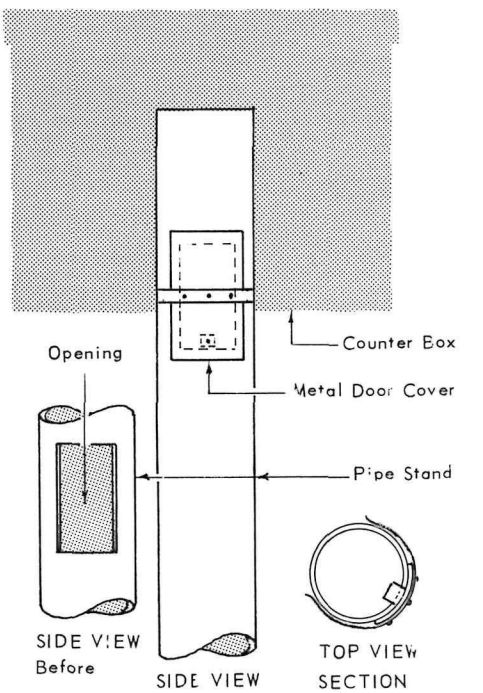
Spring controlled, flap-top trash containers are sometimes noise makers, and that usually presents an irresistable temptation to children. Ida L. Townsend, charwoman, Mount Rushmore National Monument, suggests a way to cut the clatter and reduce the temptation.

Put strips of soft rubber or automobile weather stripping inside the lips where the flap edges strike. Besides reducing noise, this will save some wear on springs, and reduction of vibration will lessen the likelihood that hinge pins will shift and closer pins loosen.

HIDDEN HAZARD IN A TRAFFIC COUNTER

Wasps seeking a snug and cozy home might find that the opening in a closed-end traffic counter pipe led to a spot just to their liking. Personnel on Blue Ridge Parkway made that painful discovery, and in retaliation built little fires at the opening to smoke out the stinging creatures before putting a hand in to unlock and open the counters. That got rid of the wasps for that trip, but the smoke blackened the pipe, deteriorated the paint, made it necessary to paint the pipe more often, and didn't assure that there would be no wasps next time.

Park Ranger John J. Wagoner devised an inexpensive, simple, and easy-to-make cover to close the pipe opening as shown in the sketches.



The pipe openings are not uniform, so the over-all dimensions of the cover are sufficient to make it usable on all. Any discarded one-gallon strong can, such as a paint can, can be used. It may be necessary to purchase the spring steel clip, but they cost less than a dollar. Twenty of the covers can be made in an hour and a half and the cost is less than $1.50.

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SCAFFOLDING FOR USE IN WATER TANK

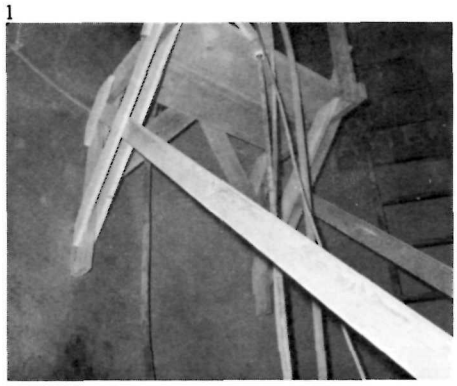
Sandblasting and painting the interior of a water tank 12 feet in diameter and 25 feet high presented some problems to Richard M. Ward, district ranger, Rocky Mountain National Park.

The opening for getting inside the tank was small, there was limited work space inside and the need to move often, and the sandblasting material had to be cleaned up periodically. It was difficult and unsafe to operate sandblasting equipment from ladders. It was impossible to get metal scaffolding inside the tank, and besides it was too expensive to purchase for one job. Built-up wood scaffolding would take a considerable amount of material, take up too much room, be difficult to move, and be in the way of cleanup of the sandblasting material.

Dick remembered having seen in his childhood scaffolding of the design shown in the photos, and it seemed a good solution to the scaffolding problem presented by the tank.

The scaffolding was easy and inexpensive to build and to get inside the tank, and it was easy to move, raise, and lower (see photos 1, 2, and 3). Special railings were placed on the scaffolding used inside the tank for safety and to hold electric lights.

1



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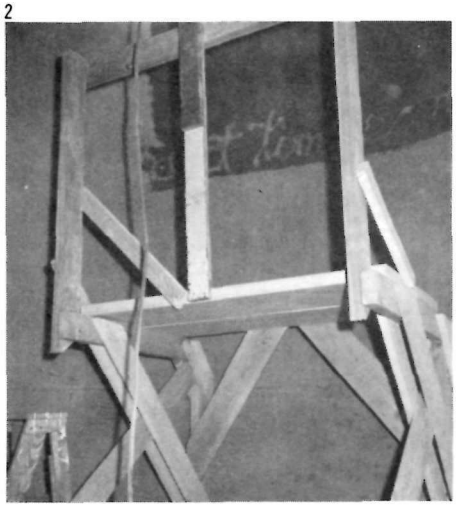


3

4

This type of scaffolding has many applications on jobs from 18 to 20 feet. Photos 4 and 5 show how it might be used on the side of a building. These two photos were taken for illustration purposes only, the scaffolding was not in use. In actual use you would want to make sure that the 2x4 braces were secure at the ground. The working planks (there should be two) would be positioned without so much overhang. The leg of the scaffolding against the wall is shown too short. While it worked well in the confines of the tank, normally the ratio between the wall leg and the platform leg should be about 2 to 1. A few toe nails may be used to secure the working planks and the wall leg if necessary.

5

PORTABLE VISE

Here's an answer to off-the-bench and out-of-shop jobs which require a vise. To Fred R. Ranalli, truck driver, Harpers Ferry National Historic Park, goes credit for the idea.

Fill a 125 lb. grease barrel or 26 gallon water barrel with gravel and concrete, half and half. Mount a vise on top.

The device can be rolled around in the maintenance shop to the place where it is needed. It will not tip over as easily as one which is mounted on a wooden stand. If needed at a job site, it can easily be rolled onto a truck.

ROLLER GUIDE FOR FIRE HOSE

A roller guide mounted behind the hose reel on the Dodge power wagon used to suppress woods and grass fires in the Tupelo subdistrict, Natchez Trace Parkway, prevents those time consuming hose entanglements when time is such a vital factor. It does more than that, it frees a man for other action. It is no longer necessary to have a man on the truck bed to feed the hose to the line men. It also eliminates friction which results when the hose is pulled at too acute an angle. Direct action on the fire is speeded up and fire loss consequently reduced.

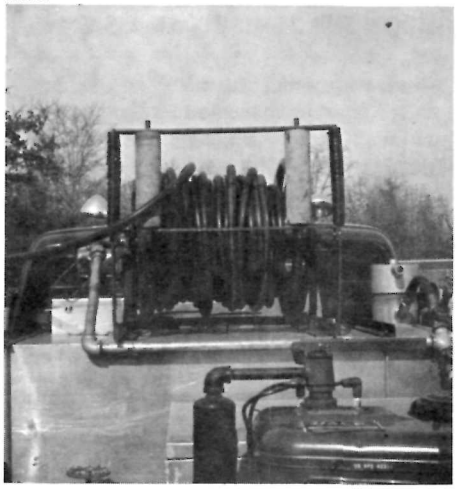
Rollers from a discarded, wringer mounted upright, one on each side of the wagon, permit smooth unreeling of the fire hose from either side and, by reducing the friction, speed up the action. Damage to the hose from abrasive wear against metal parts of the truck and excessive pulling and strain is reduced. The unreeling process is easier on the men, too.

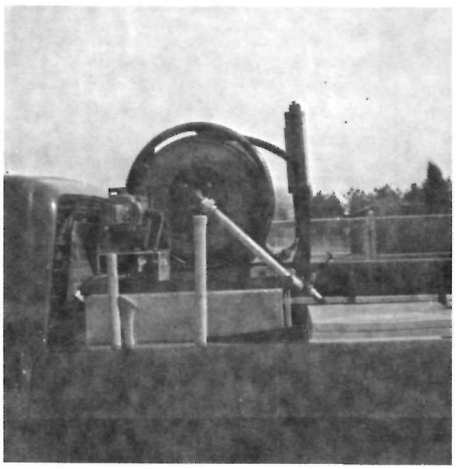
Heavy strap iron was welded to make the frame and a roller was mounted upright on each side. The whole unit can be removed, or dismantled for repair if necessary, in just a few minutes by loosening four retaining bolts. Since the device was made from scrap materials, the only construction cost was $3.00 for welding and installation.

Vester Eugene Sample, fire control aid, designed the guide.

Before

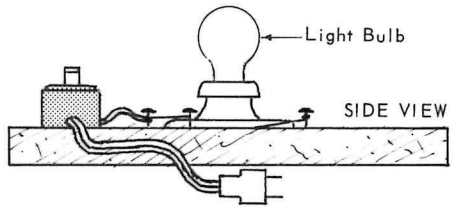
After



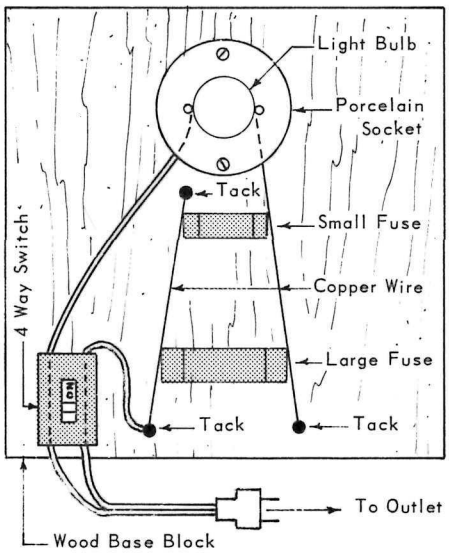


INEXPENSIVE FUSE TESTER

Fuse testers on the commercial market cost between $25 and $30. Maintenanceman Charles P. Moore, Moores Creek National Military Park, has made one for less than a dollar.



TOP VIEW



All you need is a porcelain ceiling light socket mounted on a wooden board, a length of electric cord with a plug on one end, a ground wire, a couple of screws and several tacks, and a light bulb. The wires are placed on the board in such a way as to accommodate both small and large size fuses. (See sketch.) When the wires are in place and the cord plugged in, insert one fuse at a time between the wires. If the light goes on, the fuse is good. No need for a book of instructions nor a technician to operate this one.

SAFETY ON ICE

There is much more to ice safety than just a statement on the thickness of the ice. The February 1970 issue of SAFE WORKER, a publication of the National Safety Council, carried the following rules and information which should be known to anyone who ventures out on ice.

Any statement about ice thickness and safety implies that someone has to check—and that's the main problem. Only too often no one checks ice thickness. Or victims are not aware of peculiar circumstances that make the thickness or solidity of ice vary from point to point. First, start with this short set of rules:

If ice is only ONE INCH thick, everyone stay off.

When ice reaches a thickness of TWO INCHES, it's safe for one person only. (Because skis distribute weight, it takes less than two-inch ice—about one and three-fourths inches—to support a person wearing them.)

At THREE INCHES, ice will support small groups in single file.

At FOUR INCHES or more, most activities—skating, skiing, sledding, ice fishing—are safe. An exception is snowmobiling; the machines with passengers can weight from 600 pounds to half a ton, and even allowing for their wide treads, they must have several additional inches of ice.

The kind of ice as well as its thickness requires checking when heavy vehicles are used. Ice that is granular and porous as the result of repeated thawing and refreezing can be unsafe at thicknesses that would be reliable as hard ice.

Wherever possible use ice at supervised areas such as those operated by a park system. Stay off ice during thawing spells; prolonged freezing temperatures are necessary for ice to freeze solidly.

Also, wherever the water level fluctuates, as in lagoons and reservoirs where water can be released, ice can form a sort of natural bridge from shore to shore. Such ice may be inadequate support for a skater, skier or snowmobiler crossing it.

Use a shallow-water area such as a pond, lagoon or small lake for skating. Ideally, the body of water should not be more than waist deep.

Never skate alone. Stay with a companion and keep close to shore, especially at night.

Use extra caution if it is ever necessary to cross ice that has formed over running water. Currents can erode and melt ice from below, and the level of most creeks and streams tends to fluctuate. It's important to watch out for the dark spots that indicate weak ice.

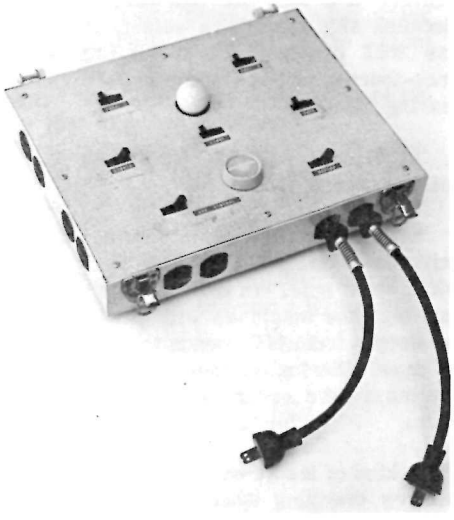
Speaking of Interpretation

ENDANGERED WILDFLOWERS

Some of the rare wildflowers of the Southern National Forests which are endangered are pictured in a 19-page booklet (20 color plates) published by the Southern Region of the U.S. Forest Service. A copy may be obtained by writing to U.S. Forest Service, Southern Region, 1702 Peachtree Road, N.W., Atlanta, Georgia 30309.

AUDIOVISUAL CONTROL CENTER

Several projectors, a tape recorder, room lights, or other electrical appliances can be controlled by the speaker, using the compact and lightweight control



panel shown here. It was devised and constructed by Park Ranger Dale L. Smith, Russell Cave National Monument.

The panel housing is 2 1/2" by 11" by 14", and weighs less than six pounds. Both lights and equipment are fully controlled with this panel from the speaker's stand or any convenient location. No assistant, with the need for the sometimes distracting signals, is necessary, and more than one projector can be controlled, eliminating a program interruption when more than one tray of slides is used.

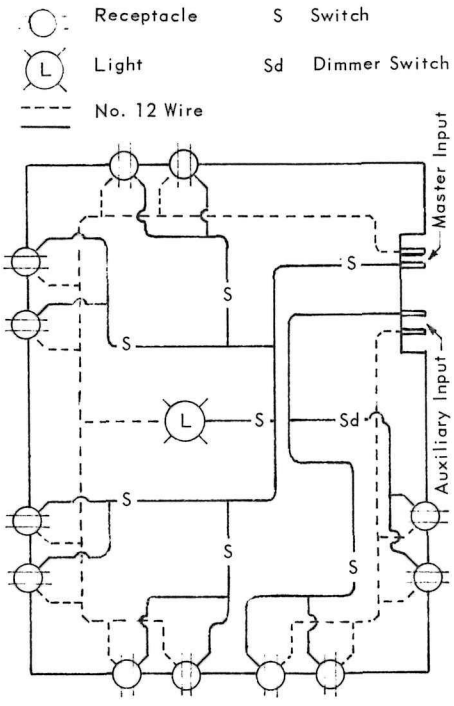
Two independent circuits preclude an overload. Both can be fed by a single extension cord, or by separate cords from separate circuits in the case of higher amperages.

The Master Circuit feeds four double receptacles and the seven-watt help light. Each receptacle is controlled independently by individual silent switches, or they can be controlled together with the master switch.

The Auxiliary Circuit feeds two double receptacles—one with a conventional switch and the other with a 500-watt capacity dimmer switch. These two switches are labeled, "Auxiliary Control."

A useful secondary feature of the panel is its removable lid which houses a 10-inch speaker and storage space for extension cords. Hinges for the lid similar to those on portable typewriter lids, were improvised from scrap metal and bolts.

DIAGRAM



The surface of panel and lid are covered with gray laminated plastic glued into place (except the panel top which is simply held in place with screws).

Technical Notes

1. The 1/4" plywood top was fitted to the inside dimension of the 1/4" plywood frame and secured to the hardwood support blocks set 1/4" lower than the top of the frame.
2. The 1/8" pegboard bottom was fitted to the inside dimensions of the 1/4" plywood frame.
3. Hardwood oak blocks were glued into the 1/4" plywood framework corners and on the sides to help support the top and bottom of the box. They were cut 3/8" shorter than the width of the sides to allow for the 1/4" plywood top and the 1/8" pegboard bottom. Two hardwood blocks support the box in the center.
4. The 1/16" laminated plastic sides were cut 1/16" wider than the sides to which they were glued. This allows the laminated plastic top, measured to the outside dimensions of the 1/4" plywood frame, to fit flush with the top of and inside the plastic side pieces. The plastic top was secured by metal screws for easy removal.
5. The socket and supporting framework for the 7-watt help light was improvised from hardwood. To mount the socket securely with a short 1/4" bolt, it was necessary to cut threads into the socket with a tap tool.
6. The feet are 5/8" plastic chair leg cups mounted on 5/8" dowel rod stubs.
7. The plugs are attached to the 1/4" plywood frame using small cubes of predrilled hardwood inside the frame to anchor the screws (not shown on diagram).
8. The input plugs are standard kitchen appliance plugs secured into an improvised hardwood framework with the nuts that are supplied with each set of plugs.
9. The input plugs are 5A-250V/10A-125V electrical appliance plugs available in many hardware stores.
10. Number 12 wire was used throughout.

WINDOW SHADE USED AS A SIGN

Here is another instance of the use of a roller window shade as a temporary sign. John W. Neckels, management assistant, Sagamore Hill National Historic Site, uses a vinyl-backed shade, on which a message has been painted or printed, in a kiosk which cannot be manned at all times. (See photographs.)

More than one message can be printed on the same shade or alternate messages can be visible, depending upon how far down the shade is pulled. Other shades with appropriate messages can be interchanged on the same brackets.

The device could be used in entrance and information stations and at campgrounds during closed hours and seasons.

The cost is low, preparation and installation are easy, they can be rolled out of sight when not in use, and they are pleasing in appearance.

Speaking of Interpretation

INDENTIFICATION FOR ROVING INTERPRETER

Historian George E. Davidson, Vicksburg National Battlefield, believes that more use would be made of the park interpreter's fund of information if his vehicle were clearly identified in such a way as to differentiate it from the usual patrol car. He feels that even when the interpreter makes himself available where groups have gathered during self-guided tours, the uniform may be a barrier to approaching him, and that in some way his identity and function should be visible to the visitor.

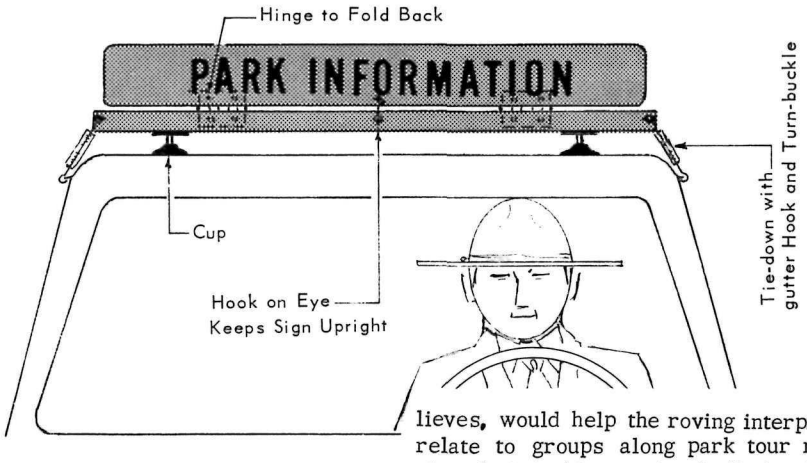
Any permanent lettering on a vehicle is unacceptable since the vehicle may be used for other purposes at other times, so George suggests a movable sign.

Using stout pine or hardwood the width of the cab and about 18 inches high, make a two-sided sign in the park color scheme, either routed, neatly paint-lettered, or press-tape-lettered. Since the term "interpreter" is confusing (to most people it means language translation) both sides of the sign should say simply, PARK INFORMATION.

Attach the sign to a crossbar of wood fitted with suction cups and tie-down turnbuckles. If desired, the sign can be attached to the suction cup crossbar by two hinges and then held upright when in use by two pins and folded down out of sight when the vehicle is used for another purpose.

The sign, with its large bold lettering, will be clearly visible from the front and rear when attached to the roof of the park vehicle, either truck or sedan (see sketch).

This mission identification, George believes, would help the roving interpreter relate to groups along park tour roads since he is in this way clearly distinguished from the law enforcement image which may be a barrier between him and some visitors.



PERMANENT SLIDE LABELING TECHNIQUE

Achieving permanency in labeling and numbering metal 35mm slide mounts presented a problem, but Supervisory Park Naturalist John Tyers and Ranger Naturalist Arthur W. Sedlack of Glacier National Park found a way.

Using a vibrating electric needle, etch the number and legend on the aluminum slide mount. Increase the visibility by filling the etching using a drawing pen filled with permanent black ink. When dry, spray the legend with clear plastic spray. To prepare the etched slide mounts for spraying, line them up against a cardboard backing, mask the transparency with tape or a strip of paper or cardboard.

Legends for metal mounted slide prepared in this way are easy to read and are permanent. While it only takes a few minutes to etch a number and legend, the whole process does take a little longer than other methods, but Art and John feel that the legibility and permanency make it well worth the small amount of extra time.

COLOR-CODING SLIDE COLLECTIONS

The North Carolina Naturalist District of the Blue Ridge Parkway has four separate 35mm slide collections, in all about 7,000 slides arranged within each collection according to subject. The four collections are distributed throughout the District for use by seasonal naturalists during the summer interpretive program. By summer's end many slides were in the wrong file or in the wrong category within a particular file. This made it necessary to look at each slide and decide whether it was misfiled—a long tedious job requiring many hours. A simple identification system was needed both to keep the slides in order during the summer use period and to speed up the checking process at season's end.

District Naturalist Donald H. De Foe devised a color-code system using dots of different colors, sizes, and positions on the slide. The largest size dot, on the front of the slide, indicates the collection to which it belongs (for example, Doughton Park). The next smaller size, on the back of the slide, indicates the category (Plants). The third and smallest dot, also on the back, indicates a category subdivision (Ferns, for instance).

This color-code system makes it possible to sort a large collection of slides quickly just by looking at the color dots, segregating the slides first by collection and then by subject within each collection. A person unfamiliar with the color code was given 100 miscellaneous slides from the four collections and asked to sort them according to a predetermined list of subjects. It took 18 minutes and 55 seconds. The same slides were disorganized and the same person was informed about the color code and how to use it. This time, using the color dots only, the sorting took 8 minutes and 30 seconds, less than half the time. Furthermore, in sorting slides without using the color code, unless each collection is checked separately, there is no way of determining in which of the four collections a particular slide belongs. With nothing more than the ability to distinguish colors, someone unfamilar with the slide subjects, who for example might not know the difference between a lizard and a salamander, can sort slides quickly and accurately.

The color dots are applied easily and quickly with a small paint brush and quick-drying model airplane enamel.

Here is a sample of the coding used at Blue Ridge.

- (dark blue) DOUGHTON (name of collection) (on front of slide)
- (red) PLANTS (on back of slide)
  - (dark green) Seed Plants (on back side)
  - (light blue) Ferns (on back side), etc.
- (aquamarine) ANIMALS
  - (white) Invertebrates
  - (silver) Fish, etc.

ENVIRONMENTAL CRISIS—YOUR GUIDE TO ACTION

Have you been concerned about an environmental problem in your area but didn't act because you didn't know where to start? Learn just what you can do. Environmental Science Center, which is concerned in all aspects of its operation with arousing the public through education to the "specter of our increasingly degraded surroundings," has just published a 21-page guidebook to involvement in environment.

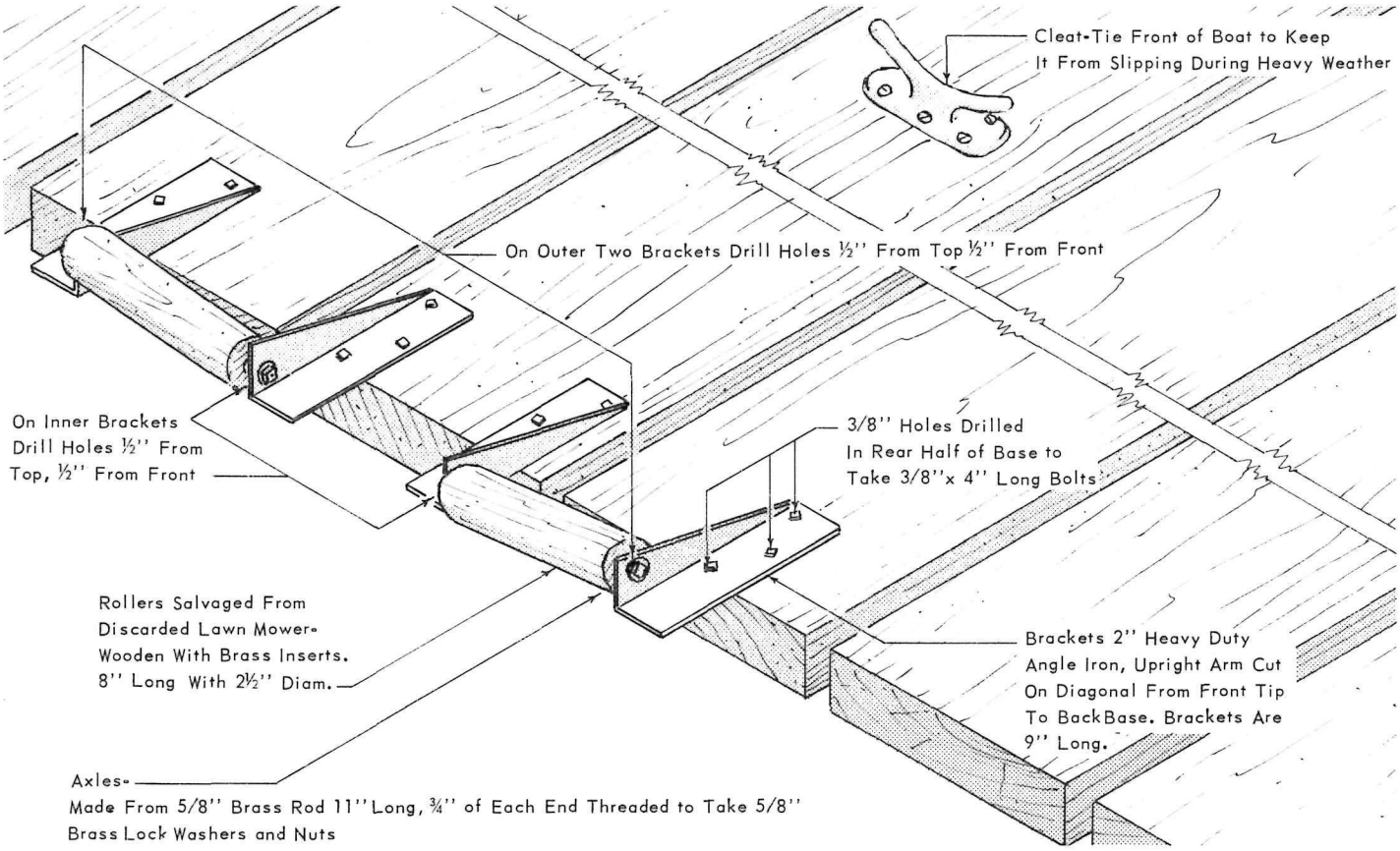
Write to Environmental Science Center, 5400 Glenwood Avenue, Minneapolis, Minnesota 55422.

ONE-MAN, ONE-MINUTE BOAT LAUNCH

Statue of Liberty National Monument, being an island operation, has a high water-hazard potential in spite of fencing along seawalls and dock. The usual aids to life saving, plastic and self-inflating life rings and long-handled hooks, are, of course, readily available—but there is no substitute for a ready-to-go boat when there is danger of drowning. Donald J. Colville, supervisory park ranger and W. Pingree Crawford, management assistant, Fire Island NS and New York City Group, concerned about the time required to get a boat going in case of emergency, designed a device to speed up the operation.

The problem was solved by installing rollers on the end of the floating stage which is used for access to the 22-foot NPS inboard-outboard (which must be sprung out to prevent buffeting and is therefore not suitable for use in a crisis). The roller from an old lawn mower was used to make the device, as shown in the sketches, which permits one man to launch a 14-foot fiberglass boat with a 9 1/2 H. P. outboard motor quickly and easily, or raise it from the water onto the stage. A single nylon line at the bow is sufficient to hold the boat securely in position because of the weight of the motor pressing the keel onto the divided rollers.

Prior to installation of this launching device the 14-foot outboard boat was inconvenient to use since it, too, had to be sprung out. The motor and gasoline tank could not be left in place because of the danger of heavy rains filling the boat to the point where it would "turn turtle." The 14-footer is now always ready for immediate use and can be launched by one man in less than a minute.



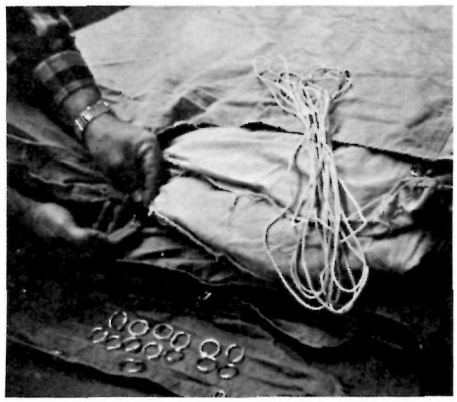
LIGHT FOR FIRE TRUCK BED

Darkness adds to the hazards of fire-fighting, of course. Supervisor Park Ranger Weston P. Kreis, Natchez Trace Parkway, Tupelo subdistrict, has brought light to one hazardous area by installing on the Dodge power wagon a light to illuminate the fire truck bed. This enables the pump control operator to see what he is doing and makes the hose and tool storage box clearly visible.

Wes used an ordinary small truck backup light (light and toggle switch cost $4.95, and it took 15 minutes to install it). The light was mounted on a 360-degree swivel, and it has a 90-degree back movement which allows it to be placed out of the way when the wagon is moving through brush and areas with low limbs. There are no batteries to be replaced, there is no fumbling around in the dark for the light is always in place and ready to use, and both hands are free for the immediate and urgent jobs.

BINDER RINGS FOR SLEEPING BAGS

Forest Service-type sleeping bags use a 288-inch string lacing to fasten the inside to the cover. After cleaning, it takes



about a half hour to put together and lace each bag.

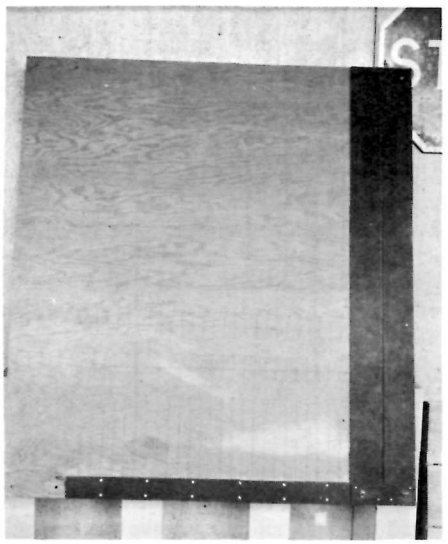
An easier and faster way was devised by Donald F. Hutchens, general supply assistant, Rocky Mountain National Park. Use binder rings instead of the string lacing as shown in photographs. It takes 14 rings for each bag, and they cost a penny each. Using this method, one man can put four bags together in an hour.

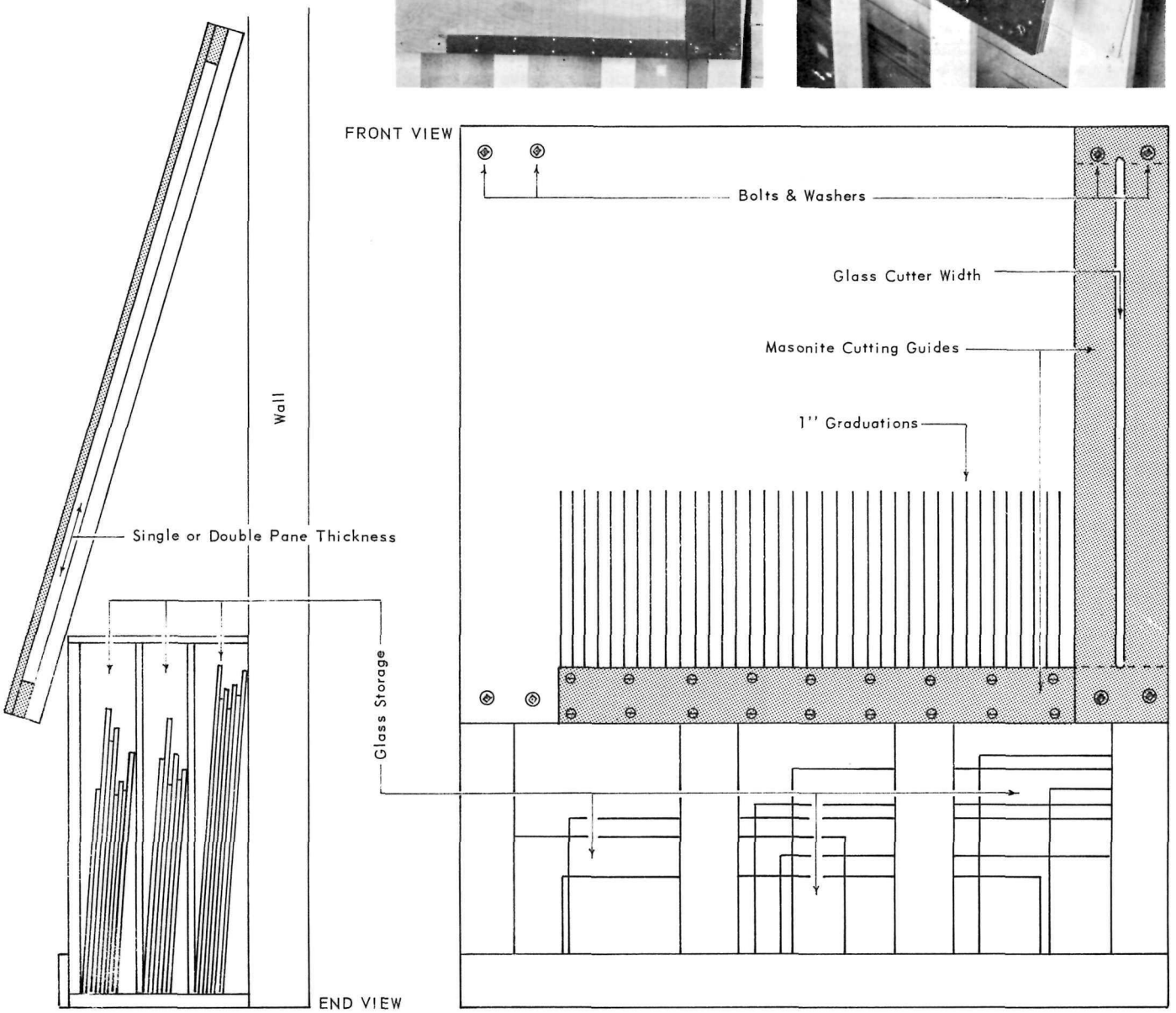
GLASS CUTTING RIG

There are many types of glass cutting devices, but the one shown in the sketch and photos has proven to be exceptionally valuable by reducing time needed to do the job and reducing breakage or loss due to wrong measurement. Manuel V. Goodman, carpenter, Dinosaur National Monument, designed the guide and storage space.

The cutting device is mounted permanently on the wall, out of the way. It is graduated on the face in inches for easy and quick measurement. The glass is placed on the board at the desired length and under the masonite cutting guide, which is elevated slightly to take the thickness of single pane. By adding a shim under the cutting guide, adjustment can be made to accommodate double pane thickness. The guide may be fastened to either end of the cutting board for left or right hand operation.

As indicated, the board is graduated in inches, but should the need arise to cut a piece of glass in fractions of an inch, one only need measure from the inch line to the desired fraction. For example, if a piece of glass 15 3/8" long is wanted, place the glass at 15", and, using a tape measure, move the glass out 3/8" from the 15" line.



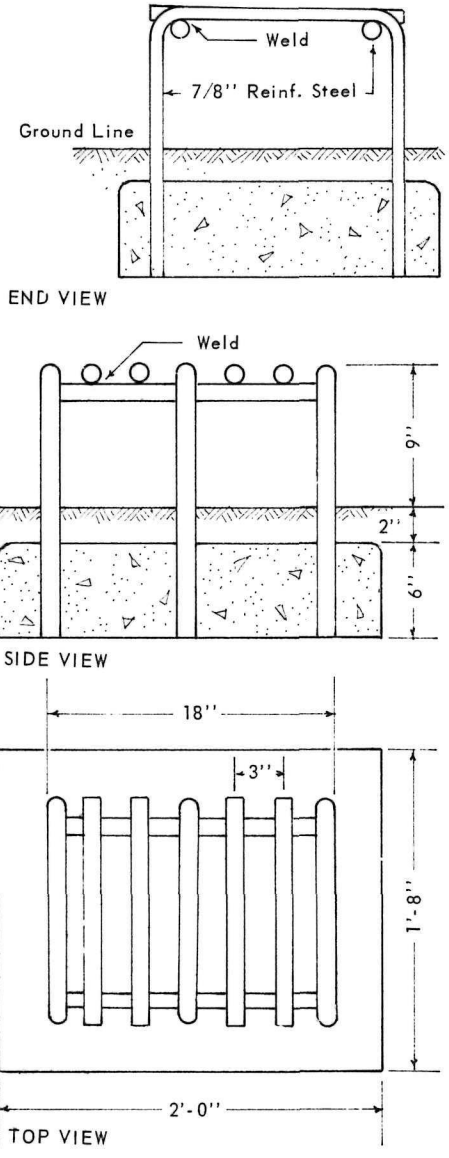


INEXPENSIVE CAMPSITE GRILL

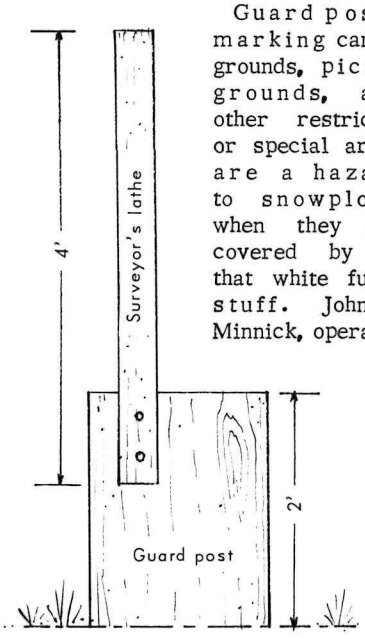
From Gale R. Trussell, chief planner, Missouri State Park Board, comes this photograph and design plan for an inexpensive, but effective campsite grill.

Wood can be placed on, under, or through the metal part of the grill. The concrete base in which it is imbedded is covered with two inches of soil to keep it insulated from campers' fires.

The grills cost about $8 each to construct.



GUARD POST EXTENSIONS AS SNOWPLOW GUIDES



Guard posts marking campgrounds, picnic grounds, and other restricted or special areas are a hazard to snowplows when they are covered by all that white fuzzy stuff. John C. Minnick, operator general, Grand Teton National Park, suggests 4-foot surveyor's lathe nailed to the guard posts as an inexpensive way to mark them in areas where snow depth does not exceed about 5 feet. The cost is about 8 cents each as compared with 25 cents each for snowpoles, and installation cost is lower, too.

CRANE FOR BUTLER-TYPE CONSTRUCTION

To avoid the cost of renting a motor crane during erection of some butler-type buildings at Cumberland Gap National Park, Work Supervisor Sam P. Lacy designed the crane shown here.

It was designed for use with a front-end loader. Sam used two 10" pieces of 4" pipe welded in an inverted "V". A hook was

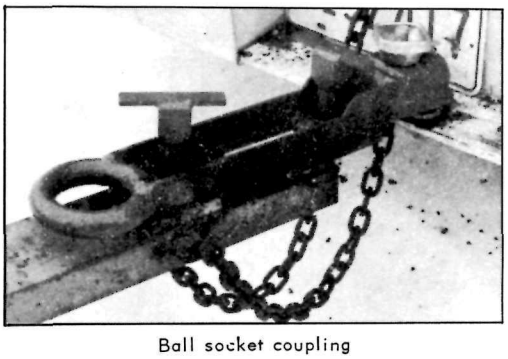
welded to the apex, and fingers were welded on the ends of the pipe to slide over the cutting edge of the dipper. A 2" eye was welded to the back of the bucket to receive a 3/4" cold-roll pull bar running from there to the apex. To mount or dismount, it is only necessary to pull the one pin on the 3/4" lift bar.

The crane has also been used for many other fitting jobs.

MULTI-HITCH TRAILER COUPLING

There is available a versatile hitch, recently tested by the U.S. Forest Service Equipment Development Center, which is designed to fit most vehicle couplings, including three sizes of ball sockets, the military pintle ring, and the farm tractor clevis coupling (see photos).

The multi-hitch, which has a 5,000-pound capacity, makes it possible to tow equipment with most vehicles—anything

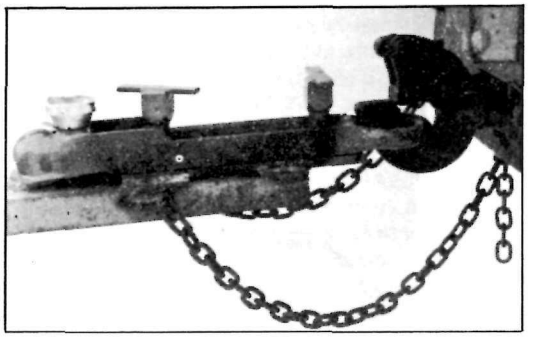


Ball socket coupling

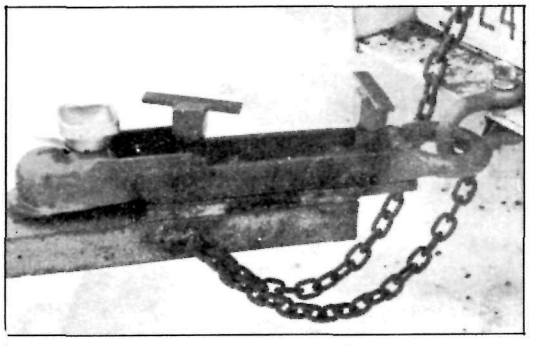
from a pickup to a dozer. It consists of the coupling and a base plate which is welded to the tow-tongue. The base plate has two threaded posts which fit through sleeves on the coupling. Each sleeve is

topped by a lock nut fitted with a handle—making it possible to tighten down the hitch by hand.

Manufactured and sold by Lloyd Messner, Box 97, St. Ignatius, Montana 59865, the hitch with base plate costs



Military pintle ring



Tractor clevis coupling

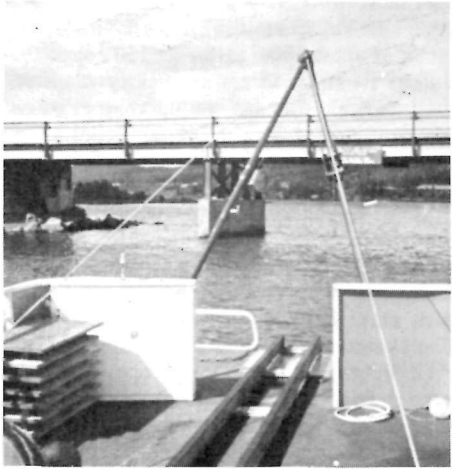
$50 f.o.b. Missoula, Montana. Shipping weight, 20 pounds. Extra base plates, $7 each; shipping weight 6 pounds.

HANDLING BUOYS, BUOY WEIGHTS, AND ANCHORS

How do you safely handle heavy buoys, buoy weights, and anchors on and off a barge without damage to the barge, injury to employees, and without the purchase or building of complicated or expensive machinery and permanent installation of equipment?

Ranger Richard M. Ward, Rocky Mountain National Park, solved it this way. A simple "A" frame with a winch to lift the weights was constructed (a second winch was added later to speed up operations). It lifts the objects out of the water or off the shore. After the objects are high enough a simple pully system allows the "A" frame to be moved to the vertical, and the objects are then lowered to a skid and pallet system. The entire weight can be easily slid to the center of the barge. To put the objects into the water they are just pushed off the end of the skid. The pallet floats free. The skid is narrow enough to slide a buoy along without a pallet.

The hoist and pallet-skid system was built from on-hand materials, and so constructed that it can be removed from the barge in a few minutes, clearing the barge for other types of work. It is estimated that even if all new materials were used the total cost of the system, including labor, would be between $50 and $70. Even more important, than the manpower savings and reduction of damage to buoys and loss of anchors, is the safety factor.



READING BELOW-GROUND METERS

There are forty-seven water meters to be read at Shenandoah National Park once a month. They are from three to six feet below ground level and reading them was sometimes quite a chore. If a box became partly filled with water, it was necessary to dip out the water before the meter could be read. Other times, due to faded lettering or condensation, it was necessary for a slender man to crawl down through the narrow opening in the top of the meter box. Some of the deeper meters have a three-foot square concrete slab cover with a 14-inch lid to allow for meter reading. When these deeper meters could not be read from the top it was necessary to raise the slab to allow a man to drop down into the box (there were no steps). Raising

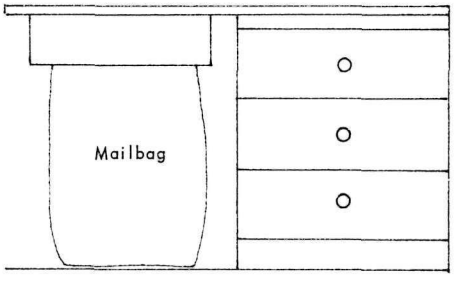
and lowering those heavy slabs is a two-man job and is a safety hazard as well, with the possibility of back strain or mashed fingers. Under these conditions it is not surprising that meter reading errors sometimes occurred.

Charles D. Campbell, plumber at Shenandoah, designed a device which makes it possible to read nearly all meters without a man's having to go into the meter box, eliminates dipping out water, eliminates the safety hazard, and reduces reading errors.

Cut 1/2" copper tubing the desired length. Flatten one end of the tube and bend to a right angle; this end will be used to lift the meter cap. About 1" above this same end attach a magnifying glass. About halfway up the tubing solder a trough to hold a flashlight; tape the flashlight in the trough. The flashlight shines through the magnifying glass and the magnified numbers are easily read.

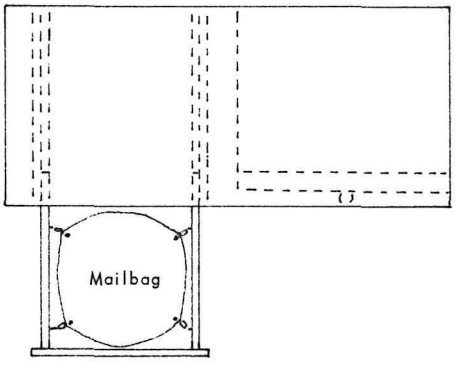
MAILBAG "DRAWER"

The mailroom mailbag at Great Smoky Mountains National Park hung on hooks under a counter. It was out of the way, but it was certainly awkward to get to, espe-



FRONT VIEW

TOP VIEW



cially with an armload of mail. Secretary Joyce McCarter suggested cutting a hole in the countertop. That would have made the bag more accessible all right, but it would also have cut down the amount of counter space of which they already had too little.

Joyce's suggestion started the thought processes about the problem and brought forth a modification of the idea. A bottomless drawer to which hooks were attached was installed under the counter and the mailbag hung on it. Now just a pull on the "drawer" and there's the wide open mailbag ready to receive that armload.

NO MORE FROZEN WATER SYSTEMS

From William T. Mixell, park foreman, Colonel Denning State Park in Pennsylvania, comes a way of being certain there will be no frozen pipes in summer cottages or vacant houses.

Shut off the main water system, open all faucets, and allow the water lines to drain. When drained as much as possible, shut off all faucets.

Put an air valve into the end of one of the faucets near the main water tank by soldering, or any alowable means, to make it air tight. Using an air compresser, pump 40 to 50 pounds of air into the water lines, water tank, or the hot water tank through the air valve. When the gauge on the water tank reaches 40-50 pounds, start at the highest point such as the bathroom, open faucets one at a time, allowing air to force all water out of tanks and lines. Then drain the main or first floor faucets, and last the basement pipes.

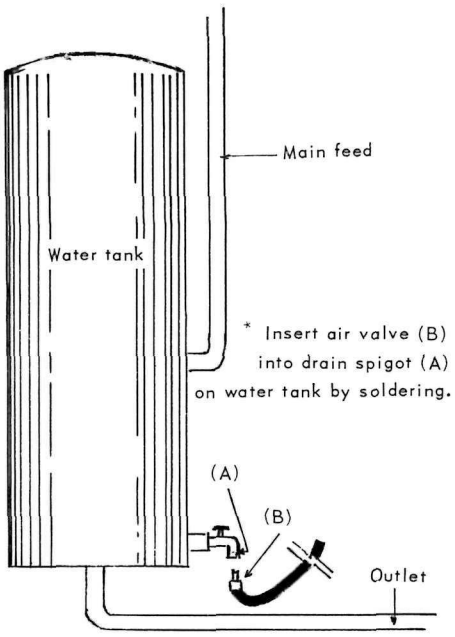
Be sure when draining the hot water tank that there is no sludge in the bottom of the tank.

When you get only air from all lines you know they are free of water.

If the furnace is hooked to the water system, do not forget to drain it also. That goes for the outside hydrants too.

For any traps in drains, such as toilet, bathtub, washbasin, or sink, pour antifreeze down the drains, allowing enough to mix with the water to assure no freezing.

AIR VALVE INSTALLATION



* Other allowable means are fine aslong as the fit is air tight.

But the top men of the natural sciences have one great advantage over us amateurs: they have discovered humility. —Freeman Tilden

HAND PUMP FOR CHEMICAL TOILET SERVICING

The U.S. Forest Service Equipment Development Center has tested an Edson Model 117A hand pump for servicing chemical toilets. The new chemical and recirculating chemical toilets have holding tanks of about 50- to 60-gallon capacity. Unless these tanks can be gravity-emptied to a larger storage vault, they require frequent pumping. The tested Model 117A lever-action proved satisfactory for this type of service.

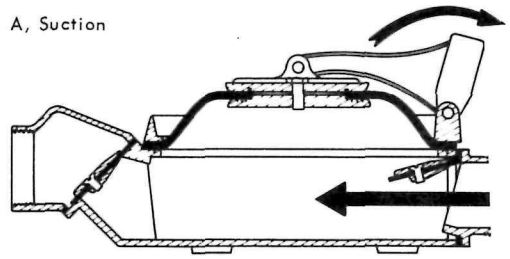
This diaphragm pump, which is also used as a bilge pump on small boats and as a dockside pump for emptying marine toilet holding tanks, is made of aluminum with steel fittings and weighs 15 pounds. The sketches show how it operates.

Under test the pump was operated to a suction head of 13.75 feet and a discharge head of 23.1 feet in an attempt to determine its maximum capabilities. After 26 strokes, the diaphragm pulled loose on the discharge stroke with 23.1 feet of head, rendering the pump inoperative. A pair of wrenches and about 15 minutes time were required to reset the diaphragm. The manufacturer recommends a maximum suction head of 15 feet and a maximum discharge head of 15 feet.

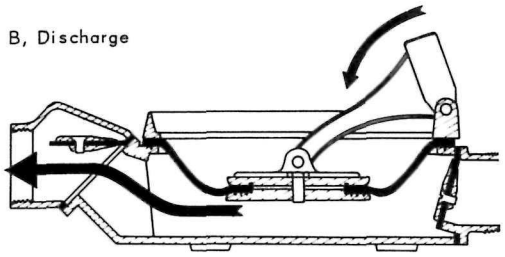
The pump was also field tested in servicing Monogram Jet-O-Matic Model 1000FE toilets on the Castle Dale Ranger District, Manti-LaSal National Forest, during the 1969 recreation season. The district ranger reported no maintenance problems, but he recommends discharge and suction hoses be kept as short as possible; all visible cans, bottles, plastics, rags, and the like be removed before pumping and that effluent be agitated before and during pumping. Disassembly was easy on the rare occasions when the pump became clogged.

It is recommended that Model 117A be ordered mounted on a Model 116 Carrying Board. A Model 671 Light Duty Suction Hose in 10-foot lengths is suitable for discharge and suction in most situations and a Model 122 Singlebar Strainer will keep large objects from clogging the hose or the pump. Heavy Duty Caps, Model 121, may be desirable for the hose or pump to prevent leakage of liquid during transportation or storage.

A, Suction



B, Discharge

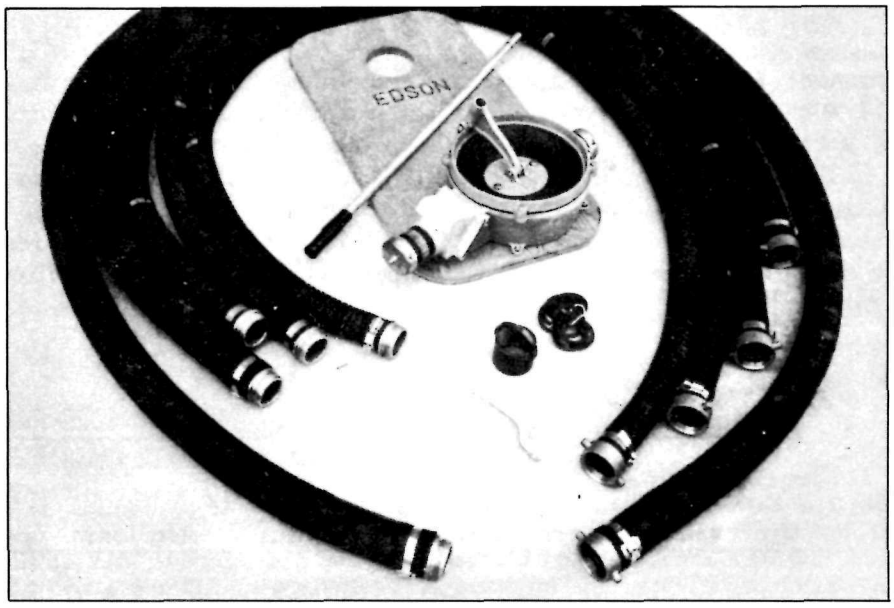


APPROXIMATE COSTS ARE:

Model 117A Pump	$ 84.00
Model 116 Carrying Board	7.50
Suction Hose, Model 671, 10' length	19.20
Strainer, Model 122	6.45
Heavy Duty Cap, Model 121	8.00

The pump and accessories or a catalog may be ordered from The Edson Corporation, 460 Industrial Park Road, New Bedford, Massachusetts 02745

Pump & Accessories



AESTHETIC PROTECTION FOR STATION AND VISITOR TRAILERS

The contact station at Grizzly Creek Redwoods State Park (California State Department of Parks and Recreation, District 1) has deep overhanging eaves. Drivers of campers and trailers, pulling in close to the station and oblivious to the hazard overhead sometimes have made a contact they hadn't intended. After three such incidents resulting in damage to vehicles and the building, Resident Ranger Jeremiah Hayes set out to do something about the situation.

He and the staff thought about it, experimented with posts, streamers, and reflectors, and then rejected all of those as unsightly.

Jerry came up with the solution which you see in the photos: log planters displaying plants common to the park. The result was an aesthetically pleasing accident prevention feature with the extra benefit of interpretation. Plant identification was right at hand, interpreting the relationship of plants to the environment could be done right there, and the need to leave the checking station was reduced.

After one year in use there have been no accidents, and many favorable comments have been received.

PRESSURE SPRAYER TRAILER

Poisoning grass and weeds on trails, using a small garden pressure sprayer is slow and expensive. Otis E. Robertson, construction and maintenance representative, Natchez Trace Parkway, designed a trailer-type pressure sprayer to do the job faster and more safely.

The sprayer, shown in the photos, was constructed in a Parkway subdistrict maintenance shop for $80. The trailer wheels are the same size and type as front wheels of the small riding mowers currently on the market, and the 40-gallon pressure tank was salvaged from a pressure-type water well system. The spray bar is a 3/4" (or 1") galvanized water pipe with spray nozzles tapped in at correct intervals to provide complete coverage of the bar width. Pipe fittings, cut-off valves, air intake valve, and pressure gauge are assembled to permit the herbicide, which is poured in at the top of the tank, to be released under pressure and sprayed from the bar which is adjustable in width, height, and pressure.

This sprayer, which covers approximately 1,200 to 1,500 feet of 4-foot trail per filling and which has been tested for a full season has reduced costs from $1,400 a year for personal services to $550 in one district of the Parkway. Its use has eliminated hand spraying and contributed to a much more complete job of trail maintenance and the consequent pleasing

appearance. Also, this is believed to be a safer method of distribution since the spray bar is closer to the ground and operates under pressure, thereby eliminating "drift" or wind carry.

ICE-FREE GUTTERS AND DOWNSPOUTS

In cold parts of the country where ice and snow stay on roofs for long periods, gutters and downspouts tend to clog up with ice; snow does not drain, and dangerous icicles form, placing extreme weight on the roofs.

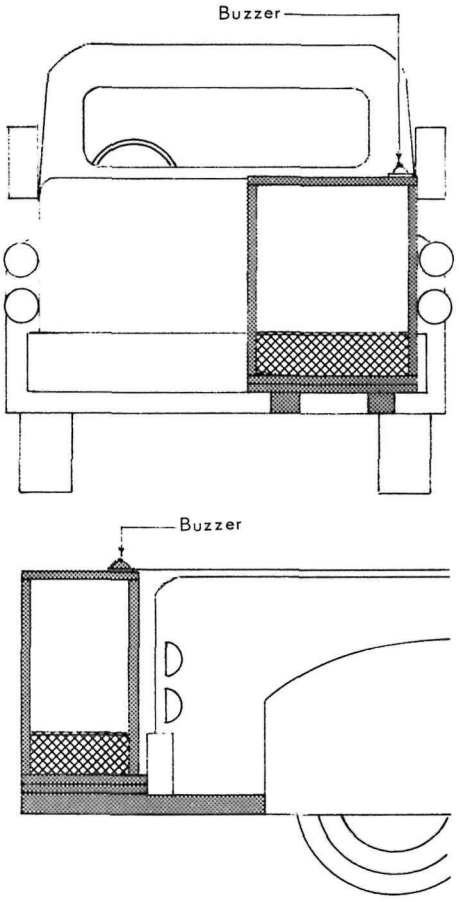
Maintenanceman William T. Cunningham, Lehman Caves National Monument, suggests laying heat tapes in the gutters and through the downspouts. This is much better than trying to wrap the tape spirally around the downspouts. Leave the tape in all winter and turn on when stormy weather occurs. There will be enough heat to melt the ice, thus keeping the gutters and downspouts free from ice build-up and allowing the roof to drain.

This method has been successfully used at Lehman Caves Visitor Center for several years.

SPEED UP ROADSIDE LITTER COLLECTION

Jumping on and off the back of a vehicle during the job of collecting roadside litter can be reduced to a minimum. Charles R. Andre, laborer, Yosemite National Park, suggests that a personnel carrier be attached to the back of any pickup truck for roadside litter collection.

The carrier would bring the worker closer to the litter so that he could remain on the vehicle. This would greatly increase the work capability of the two men working on the truck.



Machine shop personnel can make the carrier inexpensively, and all material is generally found in supply. It should have a wire mesh border about six inches high to keep feet from slipping off. The road side of the carrier should be open so that the worker can step on and off easily and safely. There should be a buzzer operating between worker and driver to maintain communication between them. Proper caution lights should be attached.

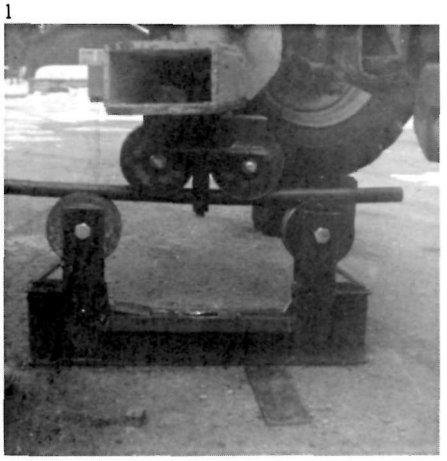
In addition to speeding up the operation, the carrier should also reduce the hazard to personnel.

PIPE-BENDER FOR MAKING CAMPGROUND TABLES

A device which will save from a fourth to a third of the cost of campground tables was designed by William J. Yenne, foreman, at Glacier National Park. If you have a welder, drill, power hack saw, and a motor grader, end loader, or hydraulic press you can make your own in spare time at a cost of about $18 each.

Photographs 1, 2, 3, and 6 show the devices in use with a scarifier frame as a press. Photographs 4 and 5 show the pipe vise (Bill's improvement over his own original locking design) which prevents endwise movement and sagging between the 90-degree bends as they are being made. In order to get better photographs of the pipe vise, a piece of 4x6 was used above the bender in lieu of the end loader arm or grade scarifier frame (photographs of the bending were taken before the pipe locking improvement was made and show the clevis used in the original design).

1



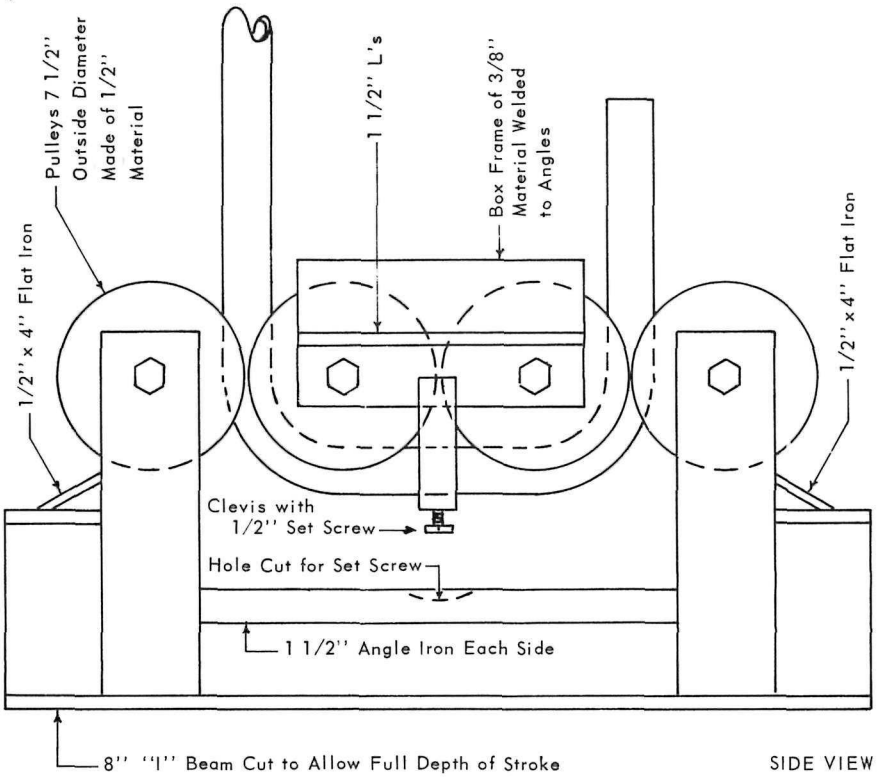
2

3

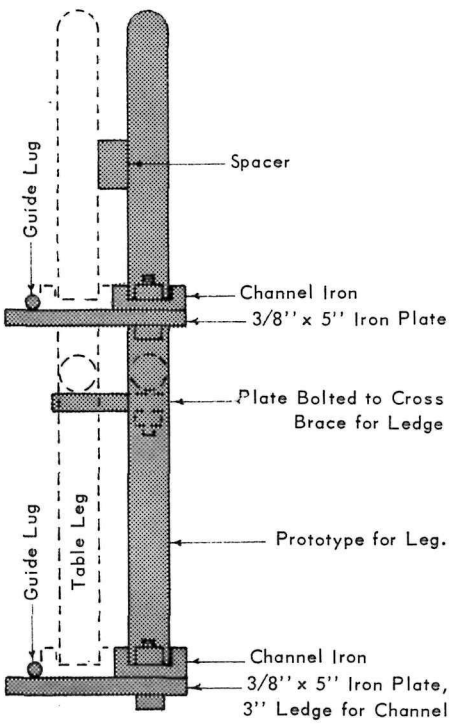
Pipe ends tend to spring back about 1/2" each to the device shown in the second sketch and in photograph number 6 is used to bend each end 1/2" past center. Ends then spring back to desired shape.

Bottom sketches show jigs (dark shaded) for welding table frame parts together.

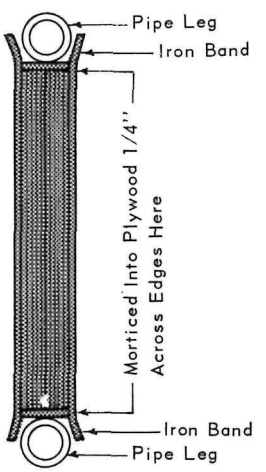
A sturdy platform, or blocking, 2 feet high makes stooping unnecessary and gives the loader operator a better view of the work.



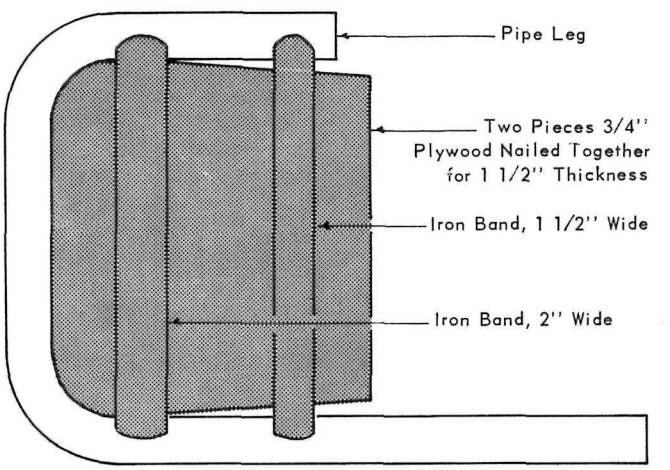
SIDE VIEW



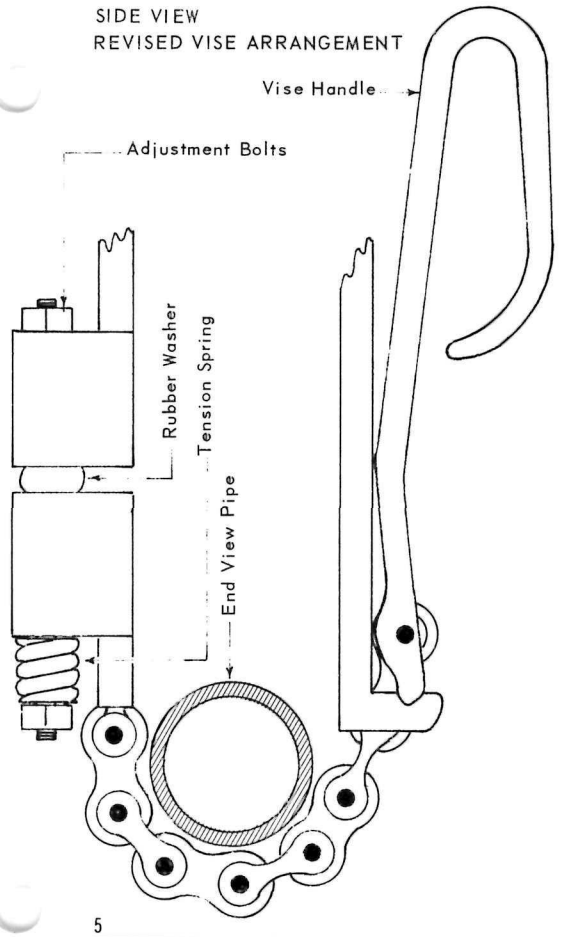
END VIEW



SECTION



SIDE VIEW



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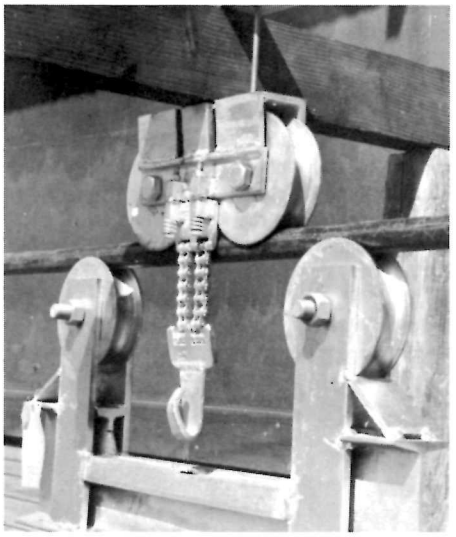

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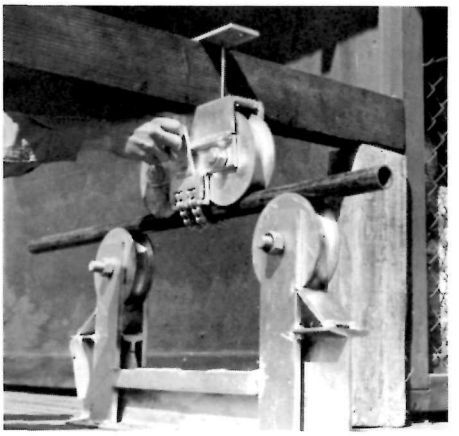


WEATHER-RESISTANT COATING

David A. Hughes, landscape architect, Western Service Center, has suggested use of a paint-like product trade-named Arabol, calling attention to its beneficial characteristics for both interior and exterior use. The product was tested in the field for about a year with favorable results.

Arabol is a translucent glue-base material to which a wide variety of water soluble colored pigments may be added. It is a good coating for wood which expands and contracts continuously thereby cracking conventional paints. Since it has a water base, it can be applied over wet surfaces, such as pipes, concrete walks, steel water tanks, assuring a tight, permanent bond.

The substance can be used successfully as exterior coating for residences, water tanks, steel sign posts, butane tanks, boat docks, and the like. Using this product and an inexpensive burlap, a tough non-skid surface results for boat docks, stair treads, and ramps. This method is used by many commercial fishing boats to make decks non-skid.

A high degree of water resistance is characteristic of the product. One steam pipe coated with Arabol which was under water for three years showed no sign of deterioration. Basically a type of polyvinyl acetate emulsion with a cream-like consistency, the product is sold by the Borden Chemical Company.

REMOVING PAINT FROM CONCRETE

Ralph E. Joines, signmaker and Mack F. Combs, maintenanceman, Blue Ridge Parkway, Bluffs District, suggest a faster method of removing old paint from concrete floors.

First wet the floor then cover lightly with sand. Rub with a rubbing stone, the same type stone used for rubbing concrete. Ralph and Mack say this method will remove the old paint better and in half the time it takes to scrape it off with a paint scraper.

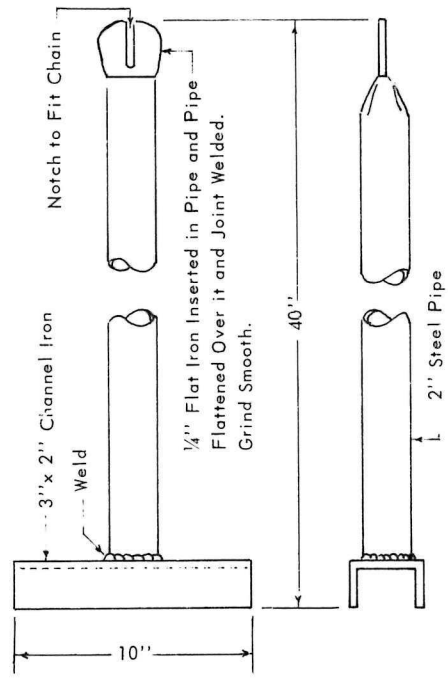
SIMPLE, INEXPENSIVE POST PULLER

Signmaker Richard E. Batman and Maintenanceman E. Lynwood Vaughan, Shenandoah National Park, devised the post puller shown in the sketches and photograph.

The puller is made of a 40-inch piece of 2-inch pipe welded to a 10-inch piece of 3-inch x 2-inch channel iron. The channel iron keeps the pipe from digging into the ground and also keeps it from tilting and skidding sideways.

A slot is made in the top of the pipe, and a chain is fastened to the bottom of the post to be pulled, the puller put in place, and a link of the chain inserted in the slot. The other end of the chain is fastened to a truck which furnishes the pulling power.

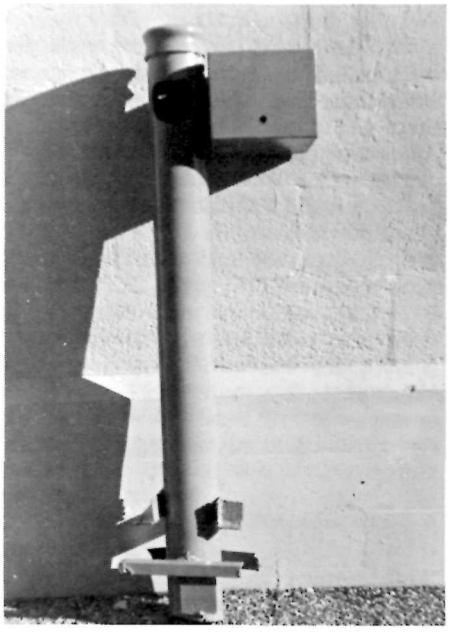
The puller eliminates digging around posts by hand and has been used to pull posts set in concrete bases about 2 1/2 feet in diameter and 2 1/2 feet in the ground, each weighing about 1700 pounds. Use of the puller permitted a three-man crew to remove and install two pairs of posts a day whereas it is estimated that six or seven days would have been required to excavate and break the concrete into sizes that could be handled and removed piecemeal.



TRAFFIC COUNTER "STRONG BOX"

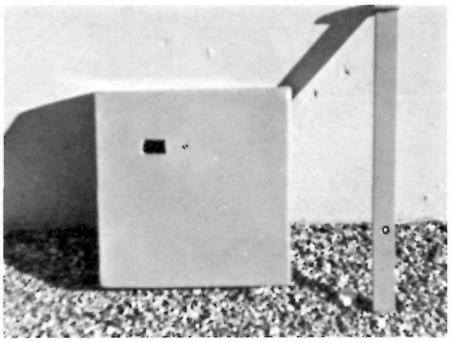
Sometimes traffic counters are stolen even though they are secured with chain and lock. Such loss can amount to a considerable sum, since the counters cost about $55 apiece. Arthur F. Graham, subdistrict ranger, Blue Ridge Parkway, designed a protective "strong box" to prevent theft.

Scrap material was used, so the boxes cost only $12 each, including labor.

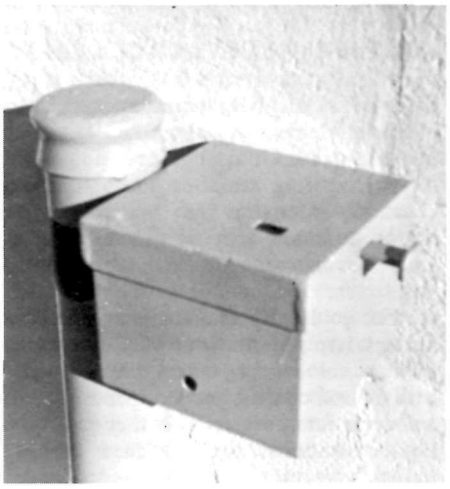


A) Pipe 4"x 4' was used for the post. Several short pieces of angle iron were welded to the bottom of the pipe for use as "dead men." A metal box made to fit the specific traffic counter, in this case 8" wide, 8" long, and 7" high, was welded and bolted to the top of the pipe. Small holes were drilled in the bottom of the box to permit drainage should moisture get inside.

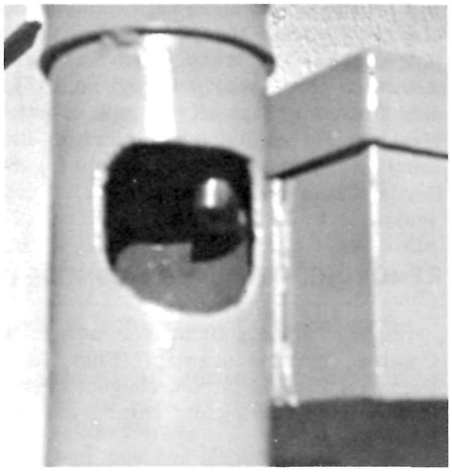
B) The traffic counter fits exactly in the "strong box" with the hose connection opposite the box hole. The reading window on the lid of the traffic counter was made larger to make it easier to take a reading.



C) The "strong box" lid also has a window which fits over the traffic counter window.



D) The metal locking rod fits through the lid, box, and into the pipe where it is secured with a padlock. There is no play in the locking rod. A small piece of metal was welded to the end in order that it might fit next to the box. The other end of the rod fits against the far side of the pipe. The lock is on the near side of the pipe. The lid never needs to be opened to read the traffic counter.



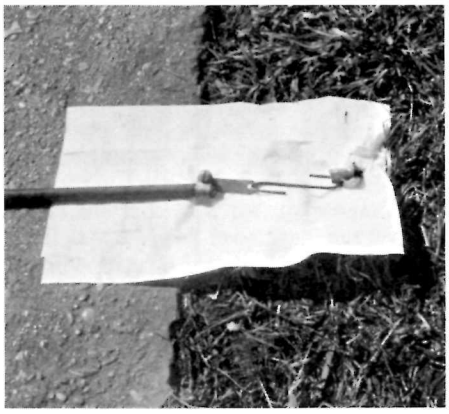
A predator may be loosely described as any animal that kills game that man himself wishes to kill.

—Freeman Tilden

INSTANT HOOKUP & RELEASE FOR TRAFFIC COUNTER ROAD TUBE

A 6" piece of #9 wire bent into a modified "S" and used instead of a bolt to attach each traffic counter road tube clamp to the stake at the edge of the road will speed the hookup or release operation.

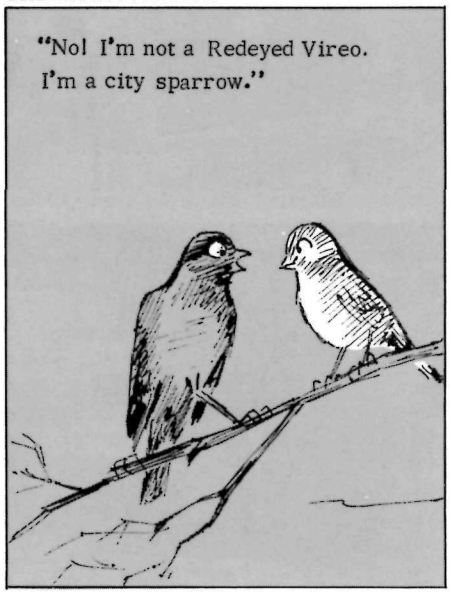
Roger E. Giddings, park ranger, Colonial National Historical Park says that 10 to 15 minutes can be saved using this method rather than the usual bolt method



of connection (or more if the bolts or holes in stakes have stripped threads). With 27 traffic counters (that's 54 road tube clamps) a significant amount of time is saved when the road tubes must be removed for repair, road grading, and snow removal. Also, the installer or repairman is exposed for much less time to the hazards of fast moving traffic.

Roger finds one of the greatest advantages of this fast method to be in keeping ahead of the snow plow during snow removal (usually an emergency operation) while removing the road tubes to prevent their being damaged.

THE SURVIVAL KIT



Jim Burnett