Equip Tips

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U. S. DEPARTMENT OF AGRICULTURE — FOREST SERVICE EQUIPMENT DEVELOPMENT CENTER — SAN DIMAS, CALIFORNIA

SANITARY, FROSTPROOF HYDRANTS FOR RECREATION SITES

Some Forest Service recreation and administrative sites are located in areas where freezing weather occurs during a significant portion of the use season. Hydrants (water faucets) located outdoors can be damaged by the water freezing in the barrel of the hydrant. Some hydrants have been rendered "frostproof" by the installation of a drain that empties the water remaining in the barrel into the surrounding soil when the hydrant is turned off. Since the drain is open, it provides a route through which ground water, insects, and dirt can enter the barrel, contaminating the water supply. In those cases where a simple standpipe is used—i.e., there are no means of draining the barrel—site managers have had to either leave the hydrant on (water flowing through a hydrant normally will not freeze), or shut off and drain the water system prior to the onset of freezing weather. Some of these actions are costly, inconvenient to the manager and the user, and dangerous to public health.

The San Dimas Equipment Development Center conducted a market search and located five units that appear to be sanitary and frostproof (Clayton-Mark Model 5441, Modern Kelly Model 6A, American Foundry Model 126, Whitewater Model 256, and Hays Module-Pac Model 30502). This **EQUIP TIPS** provides the recreation and administrative site managers with information on available hydrants, what they cost, and how they operate.

Three methods of frostproofing the hydrants were found: (1) draining the water out of the barrel into the surrounding soil (fig. 1); (2) draining the barrel into an internal reservoir (fig. 2); and (3) heating the

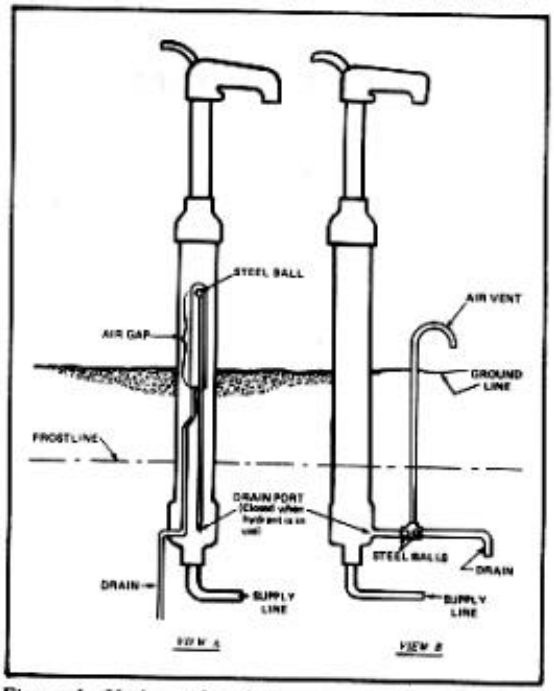

Figure 1. Hydrant that drains water in the barrel into the surrounding soil. (Clayton-Mark, View A; Modern Kelly, View B).

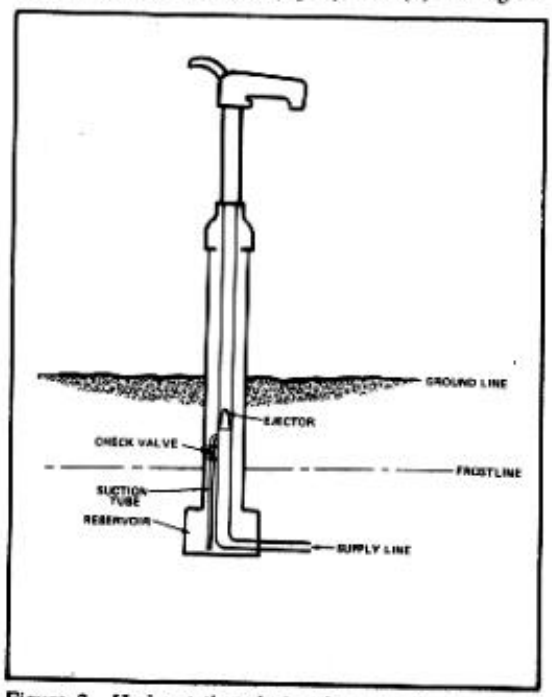

Figure 2. Hydrant that drains the water in the barrel into an internal reservoir.

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barrel with an immersion heater. (Of course, any pipe or hydrant can be made frostproof with the use of electrical heat tape.)

The Clayton-Mark Model 5441 (fig. 1, View A) and Modern Kelly Model 6A (fig. 1, View B) units allow the water to drain into the surrounding soil. Both of these units incorporate one or two stainless steel balls, and some type of syphon-breaker to prevent the entry of contaminated water and insects into the hydrants. These balls provide extra protection in the event the level of the water around the hydrant were to rise above the drain. The pressure of the exterior water on the balls tends to force them securely against their seats. A concern with these units is that the steel balls could lose their seal because of the accumulation of materials on them, or the deterioration of the Neoprene collar on which the steel ball rides in the case of Clayton-Mark and the brass fittings in the case of Modern Kelly. Because the hydrants are sealed, visual inspection of the ball and seal is impossible without cutting the units apart. To date, no method for testing the integrity of the seals has been developed by either manufacturer. Until the effectiveness of the backflow prevention device can be conveniently checked, the possibility of water contamination (cross connection) must be considered with this type of hydrant.

On the American Foundry Model 126 and the Whitewater Model 256 units, the water in the barrel drains into a reservoir built into the hydrant and set below the frostline. When the handle is turned on, the water is evacuated from the reservoir by the flow of the supply water past an ejector plumbed into the supply line within the barrel. There is no drain to the outside. The self-contained reservoir method of frostproofing hydrants appears to have merit; however, certain problems could arise. The reservoirs are not completely evacuated when small amounts of water are drawn off. (It takes up to 3 minutes of full flow to evacuate the reservoir of the Model 126 and 6 to 9 seconds for the Model 256.)

Samples of all units, except the Hays Module-Pac, have been obtained and installed at selected sites for monitoring. The above concerns can only be answered after evaluation and field testing, which will take at least 2 years before enough data are gathered to apprise the field of the results.

The Hays Module-Pac Model 30502 uses a urethane packing to provide some protection from freezing. An optional immersion heater can be used at those sites where the insulation does not provide adequate protection. Hydrants using insulation and/or electric heat to provide frostproofing do not have, nor do they require, any external drains (although the water system on which the hydrants are installed will most likely have a drain). As a result, there is no avenue for the entry of contaminants, and these units can therefore be considered inherently "sanitary" from this standpoint. Because this hydrant will require electricity to render it frostproof in some locations, its use is limited.

MANUFACTURER AND COST DATA

The manufacturer and the cost data (as of December 1976 and subject to change) for each hydrant are as follows:

Manufacturer	*Model*	*Cost ($) Bury Depth 2 ft*	*4 ft*	*6 ft*
Clayton-Mark Div. of Mark Controls Corp. 1900 Dempster Street Evanston, IL 60204	5441	102	108	115
Modern Kelly Corp. 1084 Industrial Drive Bensenville, IL 60106	6A	1/ 92	95	101
American Foundry & Mfg. Co. 920 Palm Street St. Louis, MO 63147	126	250	300	350
Whitewater Mfg. Co. Whitewater, WI 53190	256	170	181	196
Zurn Industries, Inc. Hays Fluid Control Div. Erie, PA 16512	Hays Module-Pac 30502	63	68	73

1/ The cost quoted is for a 3-ft bury depth. The 2-ft bury depth hydrant is not available as standard but can be special ordered at the same cost as the 3-ft bury depth.