

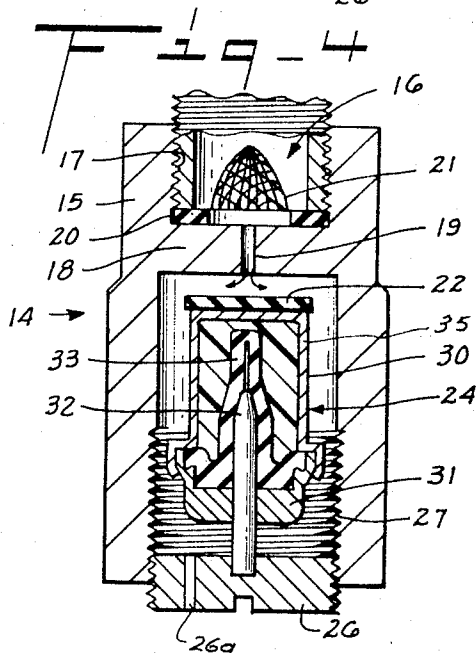
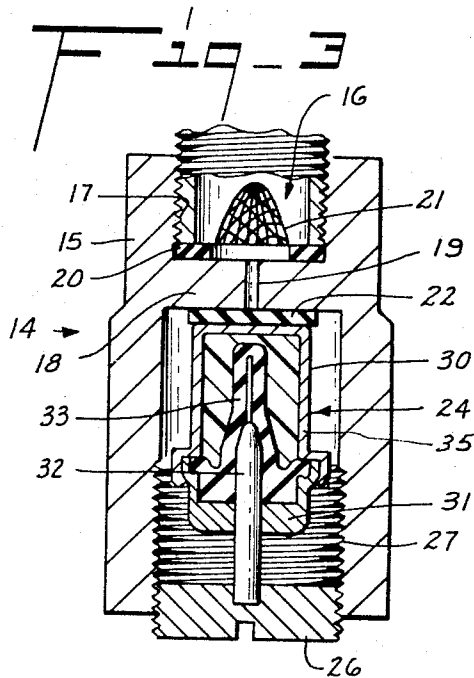
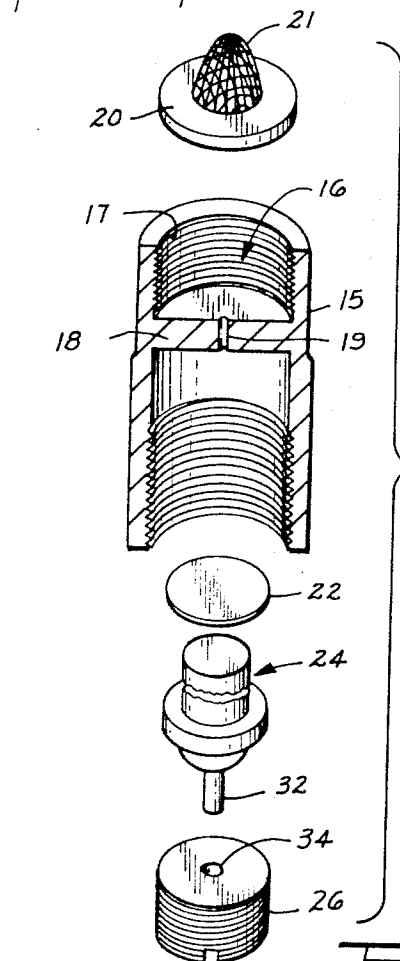
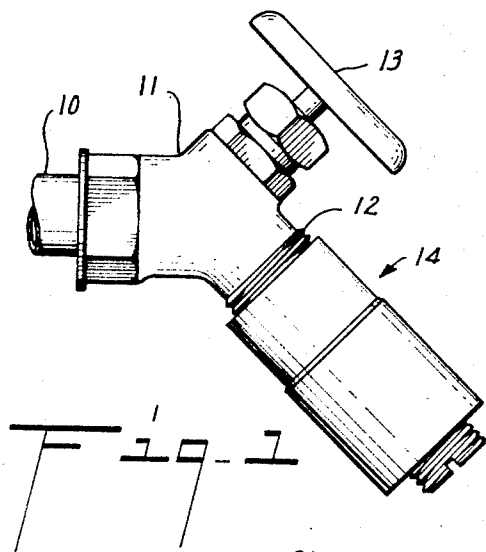
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AUTOMATIC HYDRANT DRIPPING APPARATUS

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AUTOMATIC HYDRANT DRIPPING APPARATUS

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2 Claims

ABSTRACT OF THE DISCLOSURE

Automatic hydrant dripping apparatus for attaching to an outside water hydrant to permit a small stream of water to flow from the hydrant when the ambient temperature is near or below the freezing temperature of water. The apparatus includes a housing for attaching to the faucet of the water hydrant. The housing has a passageway through which the water from the hydrant must flow. A flow restriction is located in the passageway to prevent the loss of an excessive amount of water and allow only such amount of water as is necessary to prevent freezing to flow through the passageway. A valve element is located downstream of the flow restriction. A temperature sensitive element is located downstream of the valve element to hold the valve element in sealing engagement with the partition to close the flow restriction when the temperature is above freezing. The temperature sensitive element contracts as the ambient temperature drops to a point near the freezing temperature of water to permit the valve element to move out of sealing engagement with the partition and allow the flow of water through the orifice. An adjusting nut is provided to set the apparatus to open at a preselected ambient temperature.

This invention relates to apparatus for attaching to an outside water hydrant to automatically permit a small stream of water to flow from the hydrant, when the ambient temperature approaches the freezing temperature of water.

It is an object of this invention to provide automatic dripping apparatus that will permit only the amount of water to flow from the hydrant that is necessary to prevent freezing.

It is another object of this invention to provide automatic hydrant dripping apparatus that can be quickly and easily attached to the faucets on outside water hydrants, when freezing weather is expected, and which can be quickly removed when the danger has passed.

It is another object of this invention to provide automatic hydrant dripping apparatus that can be quickly adjusted to open at a desired temperature.

It is yet another object of this invention to provide automatic hydrant dripping apparatus that is reliable, and which will not be inadvertently plugged by particles entrained in the water flowing from the hydrant.

The preferred embodiment of the invention will now be described in detail in connection with the attached drawings, in which:

FIG. 1 is a side view, in elevation, of the apparatus of this invention attached to the faucet of an outside water hydrant;

FIG. 2 is an exploded view, partially in elevation and partially in vertical section, of the components making up the dripping apparatus of FIG. 1;

FIGS. 3 and 4 are cross-sectional views through the apparatus of FIGS. 1 and 2 showing, in FIG. 3, the position of the components, when the ambient temperature is above the freezing level of water and, in FIG. 4, showing the flow of water through the apparatus, when the temperature has dropped below that preselected at which the valve is to open.

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The hydrant of FIG. 1 includes water pipe 10 and water faucet 11. The water faucet is provided with external threads 12 to which a water hose can be connected. Valve handle 13 opens and closes the faucet to control the flow of water from the hydrant.

The automatic hydrant dripping apparatus is indicated by the number 14. It includes housing 15, which is tubular-shaped. Longitudinal passageway 16 extends through the housing. Internal threads 17 are located adjacent one end of the passageway, which mate with male threads 12 on faucet 11 and serve to attach the housing to the water faucet. Downstream of threads 17 is partition 18. The partition is provided with a small orifice 19 to restrict the flow of water through passageway 16. To provide a watertight seal between the hydrant and the housing, annular washer 20 is positioned between partition 18 and female threads 17 to be compressed between the partition and the lower end of the spout of faucet 11, as shown in FIGS. 3 and 4. This insures that all the water leaving the hydrant will have to flow through orifice 19.

The size of orifice 19 could be such that sufficient water will flow from the hydrant, when the apparatus opens in the manner to be described below, to insure that the water in the hydrant does not freeze, when the ambient temperature is well below freezing. It should not be so large, however, that water is wasted. Since usually only a small stream of water is sufficient to insure against freezing, orifice 19 is preferably relatively small.

This creates the problem, however, of foreign particles in the water, such as sand and scale, becoming lodged in the orifice and stopping the flow of water from the hydrant. This could result in the freezing of the hydrant with the subsequent rupture of the water pipe and the faucet. To prevent this, filter screen 21 is attached to annular gasket or washer 20 and positioned upstream of the orifice. Preferably, the perforations in the screen are smaller than orifice 19 so that anything passing through the screen will pass through the orifice.

To control the flow of water through the orifice, valve element 22 is located downstream of partition 18. In the embodiment shown, it is a flat disc of resilient material such as rubber.

Means are located in the passageway downstream of the valve element to expand as the ambient temperature increases and to contract when the ambient temperature decreases. In the embodiment shown, temperature sensitive element 24 is employed. It consists of cup-shaped housing 30, the lower end of which is closed by cap 31. Extending through the cap is stem or rod 32. The portion of the rod inside the housing is enclosed by flexible boot 33, which provides a seal between the housing and the cap and between the cap and the rod. The remainder of the housing is filled with substance 35, which changes in volume substantially with changes in temperature. Temperature-sensitive elements of this type are available from Standard Thompson Corporation, Waltham, Mass.

Holding element 24 in engagement with the valve element, so that it in turn can be held in sealing engagement with the partition, is adjusting nut 26. The lower end of passageway 16 is provided with internal threads 27, which mate with the threads on adjusting nut 26.

By rotating the adjusting nut in one direction or the other the space between the nut and partition 18 can be changed. This space, then, can be adjusted so that the distance rod 32 extends out of cap 31 at a given temperature will be such as to cause the valve element to be in or out of sealing engagement with the partition, as desired. The nut has drilled hole 24 to receive the end of rod 32. This adds lateral stability to the rod and element 24.

Usually, nut 26 is adjusted so that rod 32 will retract into housing 30 sufficiently, at say 38.6 to 38° F., for water to start flowing through orifice 19, as shown in FIG-

FIGURE 4. The nut is provided with hole 26a to allow the water flowing through the orifice to escape from passageway 16. FIGURE 3 shows the apparatus when the ambient temperature is well above freezing. Faucet 11 is opened, of course, after the apparatus is installed so that it will offer no restriction to the flow of water from the hydrant. As the temperature drops further, the rod will be able to move farther into housing 30. This will not cause an increase in the stream of water flowing through orifice 19. For, as stated above, the amount of water flowing from the apparatus is restricted by orifice 19 so that the water is not wasted even though element 24 contracts considerably.

From the foregoing it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth, together with other advantages which are obvious and which are inherent to the apparatus.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

The invention having been described, what is claimed is:

1. Automatic hydrant dripping apparatus for attaching to an outside water hydrant, which includes a faucet having male threads on its spout, to permit a small stream of water to flow from the hydrant through the apparatus when the ambient temperature is near or below the freezing temperature of water to keep the water in the hydrant from freezing, said apparatus comprising a housing for attaching to a hydrant, said housing having a longitudinal passageway extending therethrough through which water from the hydrant must pass and internal threads adjacent one end of the passageway for mating with and threadedly connecting the housing to the male threads on the faucet of a hydrant, a partition located in the passageway downstream of the female threads, said partition having a small orifice therethrough to restrict the flow of water through the passageway, an annular gasket of resilient material located between the partition and the female threads to

be compressed between the faucet and the partition when the housing is screwed onto the faucet to provide a seal between the housing and the faucet to cause all the water flowing from the faucet to pass through the orifice, a valve element in the passageway downstream of the partition and movable into sealing engagement with the partition to stop the flow of water through the orifice, means located in the passageway downstream of the valve element to expand as the ambient temperature increases and to contract when the ambient temperature decreases, and means located in the passageway downstream of the temperature sensitive means and movable toward and away from the valve element and temperature sensitive means for adjusting the space provided for the temperature sensitive means for the temperature means to hold the valve element in sealing engagement with the partition when the temperature is well above the freezing temperature of water and to contract sufficiently when the ambient temperature approaches the freezing temperature of water for the valve element to be moved away from the partition by the water pressure upstream of the partition whereby a small stream of water can flow from the hydrant and keep it from freezing.

2. The combination of claim 1 further provided with a filter screen located in the passageway upstream of the orifice to collect all particles in the water flowing into the housing that are larger than the orifice to prevent the orifice from being plugged by one or more of such particles.

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