R. A. ANDERSON.

PROTECTIVE DEVICE FOR FLUID SYSTEMS.

APPLICATION FILED FEB. 16, 1910.

1,066,973. Patented July 8, 1913.

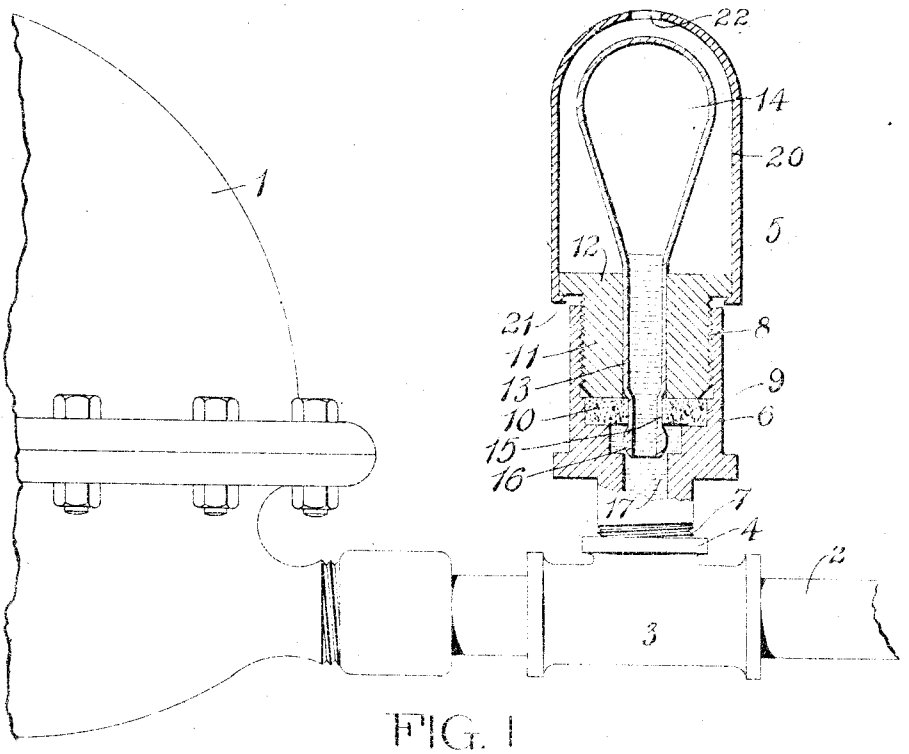


FIG. 1

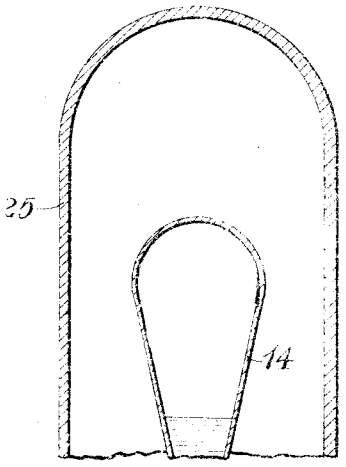


FIG. 2.

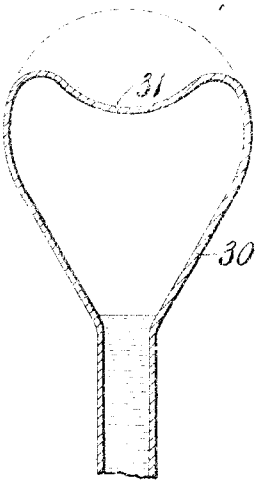


FIG. 3.

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PROTECTIVE DEVICE FOR FLUID SYSTEMS.

1,066,973. Specification of Letters Patent. Patented July 8, 1913.

Application filed February 16, 1910. Serial No. 544,175.

To all whom it may concern:

Be it known that I, ROBERT A. ANDERSON, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Protective Devices for Fluid Systems, of which the following is a specification.

My invention relates to means for protecting fluid systems such as water pipes, receptacles or meters from damage due to excess of pressure in the fluid contained therein, and is designed more particularly to protect water meters or other receptacles from the effects of the freezing of their contents.

In the accompanying drawings, which form a part of this specification, Figure 1 is a view partly in elevation and partly in section illustrating a portion of a water meter, a pipe leading thereto and one of my protective devices applied to the pipe; Fig. 2 is a fragmentary sectional view illustrating a modification of my device; and Fig. 3 is a sectional view of a modified form of bulb.

Referring to the drawings in detail, the numeral 1 designates the meter or other device or receptacle which it is desired to protect. 2 is a pipe leading thereto, which contains a T 3. With the side outlet 4 of the T I connect my protective device 5. The latter may be constructed in a variety of ways, but I prefer to form the same of a plug or nipple 6 having an externally screw-threaded end 7 which may be screwed into the outlet 4 of the T, and an internally threaded cylindrical portion 8 provided with a seat 9 for the reception of a packing ring 10. The packing ring may be of rubber or other suitable material, and is held in place by a plug or gland member 11, provided with a flange 12 at its outer end. The plug 11 and packing ring 10 are perforated to receive the tubular neck 13 of the bulb 14, which forms an essential feature of my invention. The inner end of the neck 13 is contracted as indicated at 15 to provide a seat for engagement with the packing ring 10, the latter being sufficiently resilient to permit the enlarged end 16 of the bulb neck to be forced therethrough and to contract into the groove formed by the contracted portion of the neck, thus serving to retain the bulb in position. The bulb is open at its inner end and is in connection with the water-pipe 2 through the opening 17 in the nipple. The bulb may be made of any material which will break or stretch under the influence of excessive pressure within the same, and thus relieve the pressure in the pipe and meter 1 to an extent sufficient to prevent damage thereto. I prefer to make the bulb 14 of glass or other frangible material, so that it will burst and permit free outflow of the water contained therein. In order to protect the bulb from injury from external sources, I preferably cover the same with a cap 20, having an in-turned flange 21, which engages beneath the flange 12 of the plug 11. In order that this cap may not impede the expansion of the fluid after the breaking of the bulb, I may provide it with one or more vents or outlets 22.

In Fig. 2 I have shown a modification of my device in which the bulb 14 is contained within a cap 25 similar to the cap 20, but without a vent. The cap in this case will serve to prevent the leakage of the fluid upon the breaking of the bulb 14. In order, however, to permit the bulb to serve its function and allow expansion of the contained fluid, I make the cap 25 of considerably greater volume than that of the bulb or of the cap shown in Fig. 1. Thus, when the bulb bursts the pressure within the system will be greatly relieved and will not rise again to an appreciable extent until the cap 25 is nearly filled. Under ordinary circumstances the volume of the cap will be sufficient to permit an ample expansion of the fluid in the system.

In Fig. 3 I have shown a modified form of bulb which I may use with my apparatus, this bulb being formed of a flexible material, preferably a soft metal such as lead. The bulb 30 in this case is formed with a reentrant portion 31, which upon the rise of pressure within the bulb will be forced out into the position indicated in dotted lines. If the increase in volume due to this distention of the bulb is insufficient, the latter will burst.

It will be seen from the above description that I have provided, in order to allow for a certain expansion or rise in pressure of the fluids in a fluid system, a device acting to provide for an increase in the volume of the contained fluid, which at the same time permits a decrease in the pressure in the system and does not rely for its operation upon the continued increase of pressure in the system, as in certain devices using springs or air

cushions, the use of which has been heretofore suggested. My bulbs, by breaking, act positively to permit a free expansion of the fluid in the system, their breaking being at the same time no disadvantage, as their cost is negligible and they may be replaced without difficulty.

Having thus described certain modifications of my invention, but without limiting myself to the specific structures described and shown, I claim:

1. In combination, a fluid system and a protective device therefor including a glass container, in communication with said system, having a pressure resistive strength substantially less than that of the remainder of the system, and a fluid-tight compartment surrounding said container.

2. A fluid system, and a protective device therefor, said device including a relatively frangible container in communication with said system, and means for separably connecting said container to said system, including a tap member adapted to be inserted in some part of said system, a gland member surrounding said container, means for detachably securing said gland member to said tap member, and means for forming a fluid-tight connection between said container and said tap member.

3. A fluid system, and a protective device therefor, said device including a relatively frangible container in communication with said system, and means for separably connecting said container to said system, including a tap member adapted to be inserted in some part of said system, a gland member surrounding said container, means for detachably securing said gland member to said tap member, means for forming a fluid-tight connection between said container and tap member, and a fluid-tight shield surrounding said container.

4. A fluid system, and a protective device therefor, said device including a relatively frangible container in communication with said system, and means for separably connecting said container to the system, including a tap member adapted to be inserted in some part of said system and having an internally threaded portion, a gland member surrounding said container and having an externally threaded portion adapted to fit said tap member, and means for forming a fluid-tight connection between said container and tap member.

5. A fluid system, and a protective device therefor, said device including a glass container in communication with said system, and means for separably connecting said container to the system, including a tap member adapted to be inserted in some part of said system and having an internally threaded portion, a gland member surrounding said container, and having an externally threaded portion adapted to fit said tap member, and means for forming a fluid-tight connection between said container and tap member.

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