June 3, 1930. H. G. CARLSON 1,762,010

PROTECTING DEVICE FOR BLEED PASSAGES

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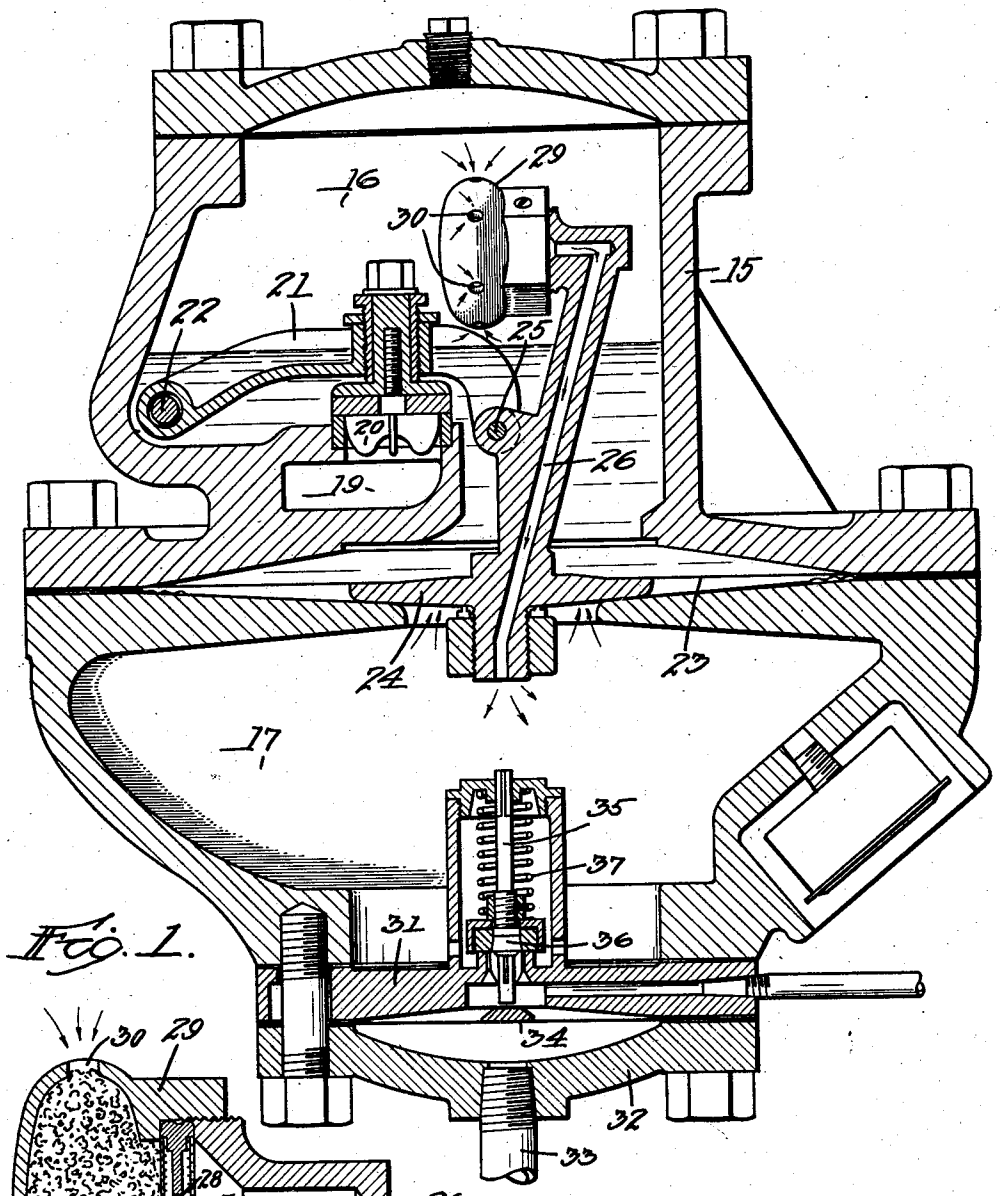


Fig. 1.

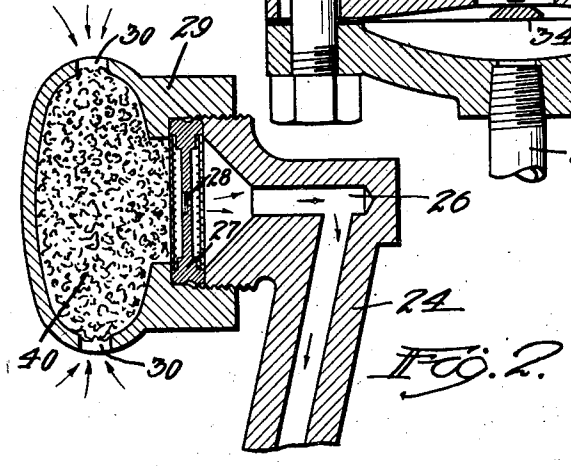


Fig. 2.

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UNITED STATES PATENT OFFICE

HJALMAR G. CARLSON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO ROCKWOOD SPRINKLER COMPANY OF MASSACHUSETTS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS

PROTECTING DEVICE FOR BLEED PASSAGES

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This invention relates to means for protecting a bleed passage particularly adapted for use in a dry-pipe sprinkler system.

In freezing weather air under pressure is maintained in the sprinkler system, its pressure automatically holding its dry-pipe valve shut. If heat melts open one of the sprinklers, the sudden releasing of this air causes the system pressure to go down suddenly when the bottled up air in the lower chamber of the exhauster causes it to open its valve, thereby discharging the compressed air from the system and hence shortening the period of time required to get water to the fire. To save air pumping during the warm weather it is more or less the custom to set the dry-pipe valve open and maintain water directly in the system without the intervention of compressed air. In that case any dirt or fine sediment contained in suspension by the water is liable to settle in the filter and plug it tight. If that happens the exhauster will fail to function when compressed air is substituted again in place of water, for no air will penetrate through the filter to the space below the diaphragm. In some western river waters there is so much fine silt that merely testing the system by opening it when set dry may plug the filter and render the device useless.

The principal object of my invention is to provide a simple automatic means for protecting the bleed passages in devices operating in this manner from being obstructed by the deposition therein, or in the passages leading thereto, of substances such as dirt or silt.

Other objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings in which

Fig. 1 is a central sectional view of an air exhauster for use with a dry-pipe valve for a sprinkler system illustrating a preferred embodiment of this invention, and

Fig. 2 is a central sectional view of the protector for the bleed opening, on enlarged scale.

I have illustrated the invention as applied to a type of air exhauster such as that set forth in my prior Patent No. 1,504,811, patented August 12, 1924 and in the patent to George I. Rockwood, No. 1,502,879, patented July 29, 1924.

As set forth in the said patents the invention is shown as applied to a sprinkler system having an air exhauster comprising a casing 15 in two parts, as shown, provided with an exhaust chamber 16 and an air storage chamber 17. The chamber 16 will be understood to be connected with the sprinkler system as in said patents and this chamber also has an exhaust passage 19 adapted to be closed by a valve 20 mounted on a pivoted lever 21 and adjustable in any usual way thereon. This frame is pivoted on a stud 22 in the casing and chamber 16.

As described in said patents the chambers 16 and 17 are separated by a diaphragm 23 on which is mounted a valve lifter 24. This valve lifter is pivoted to the lever 21 at a point 25 so that when the pressure in the chamber 17 exceeds that in the chamber 16 plus the weight of the water on the diaphragm, the valve 20 will open. The valve lifter 24 is provided with a passage 26 extending up through from the chamber 17 to the chamber 16. At the upper end this passage is substantially closed by a filter 27. This is shown as a simple self-contained element adapted to be placed on the head of the valve lifter 24 which is shaped to receive it. It is shown as provided with two filters and a small plate 28 having a center bleed passage of very fine dimensions. These filters, or at least the one on the outside, are designed to protect it from solid particles which might be deposited in the very small passage and plug it up. It is shown with two filters so as to be reversible. Heretofore I have used an annular nut to secure the filter disc to the valve lifter. To incorporate my present invention in an actual design, I attach to the nut a hollow casing 29. This casing is also provided with a series of inlets 30 around the same to admit air freely and its interior is entirely filled with sponge material 40 which is porous and will expand when wet. This may be in one piece or several, if desired, but it is desirable to fill

the entire interior of this head clear down to the screen of the filter 27.

I have shown the invention as used with substantially the same means for retaining the quick closing of the exhaust valve and eliminating the hammering action due to any vibration thereof as shown in the above mentioned Rockwood patent. For this purpose the bottom of the casing 15 is shown as provided with a mushroom plate 31 having a plate 32 secured to the same and both having chambers therein. One of these chambers is connected by a pipe 33 to the drain chamber of the dry-pipe valve. A diaphragm 34 extends across the space between these two chambers. It carries a stem 35 which is provided with a relief valve 36. This cooperates with the plate 31 which has a surface forming a valve seat. A spring 37 is arranged to keep the valve 36 closed. This operates in substantially the manner shown in the above mentioned patent, although its details are different.

When water has been admitted to a dry-pipe system containing an exhauster or accelerator provided with the bleeder protector herein described the sponge is immediately swollen with water and gently presses against the interior surfaces of the casing 29. Therefore, any deposition of silt or dirt would simply tend to fill the holes with a wet mass. On withdrawing the water and admitting the air under pressure, no deformation of the sponge would occur unless all of the small holes, those on the bottom of the circumference as well as those more exposed to gravity, are plugged. If such should be the case, however, then the air would slightly compress the sponge at one or more holes and penetrate it, through the greater surface thus exposed, to the filter and bleed hole. Thus the use of spongy material automatically supplies just the right increase of surface to the entering air to prevent its material exclusion, without exposing that surface to the action of floating silt.

The effect of such an arrangement is to greatly prolong the useful life of the sponge, for the casing, surrounding as it does, the spongy particles, protects them from continual infiltration of the circulating dirt and the dirt itself seals only those sponge surfaces directly opposite and protruding into the holes. The gentle elasticity of the wet sponge precludes any material loss of air pressure when air is being forced through it. When once wet the sponge would remain wet throughout its life, as the relative humidity of the atmosphere in a dry-pipe system is 100%, owing to the presence of the priming water in both the exhauster and the dry-pipe valve.

The casing 29 can be removed readily for cleaning or reversal of the screens in the filter 27 and for the replacement of the sponge material if that should prove to be desirable. This element will have great durability on account of the material used and need be replaced only very seldom. When used for a long period of time without operation of the device due to the opening of any sprinkler heads it will still retain its relative properties without inspection of any kind.

Although I have illustrated and described the invention as used in connection with constructions similar to those shown in the above mentioned patents, that is simply for convenience, and I do not wish to be limited to these particular constructions or particular systems to which they relate. Furthermore, changes in the construction of the invention itself can be made by any person skilled in the art without departing from the scope of the invention as expressed in the claims.

Therefore, I do not wish to be limited in these respects but what I do claim is:—

1. The combination of a member having a passage through it for air and provided with an externally threaded head, of a filter located on the outside of the head for protecting a fine bleed passage, and a perforated casing screwed onto the head to hold the filter in place and filled with porous compressible material to protect the bleed passage from impurities of air and water.

2. The combination of a member having a passage through it for air and provided with a head, of a filter screen located on the head, a plate spaced from the screen and having a fine bleed passage, and a perforated casing on the head filled up to said screen with sponge to protect the bleed passage from impurities.

In testimony whereof I have hereunto affixed my signature.

HJALMAR G. CARLSON.