Oct. 27, 1931. J. R. CARNES 1,828,763

FIRE HYDRANT VENT VALVE

Filed March 13, 1928

Fig. 1.

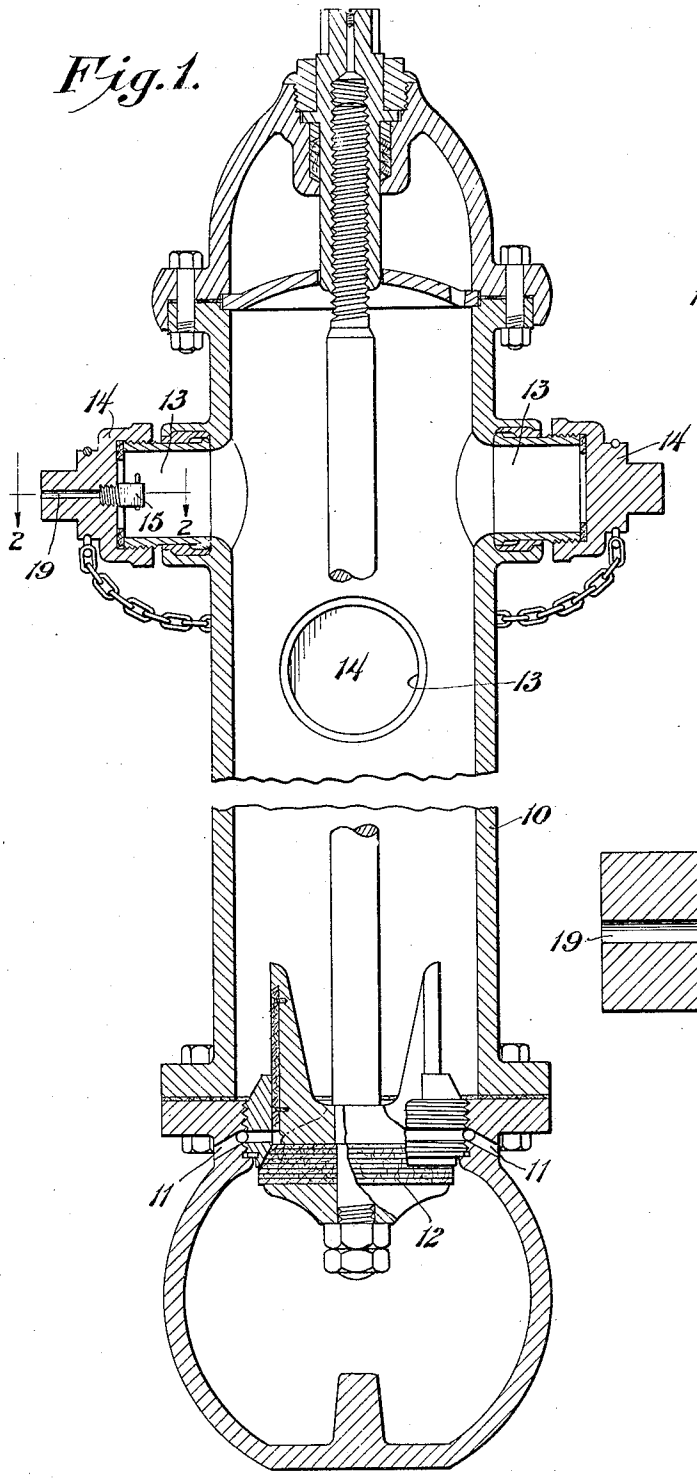



Fig. 3.

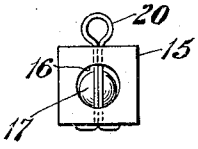
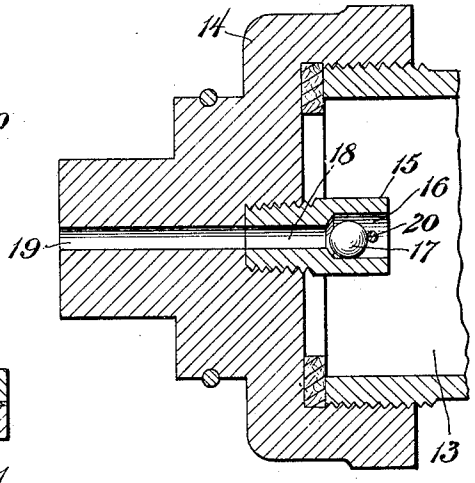



Fig. 2.




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# UNITED STATES PATENT OFFICE

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## FIRE HYDRANT VENT VALVE

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This invention relates to fire hydrants and among other objects, aims to provide an automatic air vent therefor, which will permit the water in the hydrant to drain therefrom after the hydrant valve and outlet caps are closed, to prevent freezing in cold weather.

In the drawings:—

Fig. 1 is a vertical sectional view of a fire hydrant embodying the invention;

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1; and

Fig. 3 is an end view of the vent valve.

Referring particularly to the drawings there is shown a hydrant 10 of any conventional type having one or more drain openings 11 above the control valve 12, and a plurality of outlets 13 adapted to be closed by caps 14. The openings 11 are adapted to be opened when the valve 12 is closed, to permit water which remains in the hydrant above the valve to drain therefrom, into a sump drain or sewer (not shown) and thereby prevent it from freezing and bursting the hydrant. However, the drain openings in themselves are not adequate to prevent freezing, especially in extremely cold weather. After the hydrant has been used, it has been found that when the valve 12 is closed and the caps 14 are replaced, the water remaining in the casing will drain very slowly due to the partial vacuum and to the small drain openings. If one of the caps is left off, to admit air above the water, it will drain off faster, but this necessitates some one waiting until the water has drained before replacing the cap. Even then there is no way to tell when the water has entirely drained.

To overcome these objections the present invention provides means whereby the caps may be replaced immediately after using the hydrant and the water will always drain therefrom. Herein, a vent valve 15 opening inwardly is associated with one of the caps to permit air to enter and displace the water as it drains. The valve 15, in the present instance is shown as comprising a piece of square stock metal, preferably of non-corrosive material having screw-threads on one end, by means of which it is secured to the inside of a cap. The body portion is provided at its inner end with a longitudinal bore 16 for a portion of its length which terminates in a tapered seat for a ball 17 of smaller diameter than the bore. A smaller longitudinal bore 18 is provided between the seat and the outer end of the body portion and this bore communicates with a vent opening 19 through the cap (Fig. 2). To prevent the ball from falling out of the bore 16, a cotter pin 20 or the like may be employed. Thus, the valve acts as a check valve opening inwardly to admit air when it is required.

In any hydrant, regardless of the number of outlets, it is necessary to use only one valve which may be placed at any point above the water level. In the hydrant shown there are three outlets, one being lower than the others. When the control valve is closed, the water level in this case would be at the lowest point of whichever outlet has been opened, so that by placing the vent valve in either of the caps of the highest outlets, a proper venting is assured. The vent valve could be placed in the wall of the casing, and function equally as well, but it is easier to apply it to one of the caps than to dismantle a part of the hydrant and apply it elsewhere. All that is necessary to install a vent valve is to remove the desired cap, drill the small bore 19 through the cap and drill and tap the inside of the cap and screw in the single check valve 15.

It will be seen that after the hydrant has been used and the caps replaced, air may enter through the vent valve to permit the water to drain. It will also be seen that if any cap other than that containing the vent valve is removed, and the control valve is opened, the pressure of the water in the casing will cause the vent valve to close by forcing the ball 17 against its seat 16, thereby preventing the escape of any water through the vent opening 19. Also, the vent valve will not close until pressure is formed in the casing by operating the hydrant valve, thus allowing the vent to be cleared or cleaned before the pressure seats the valve. This insures a clear passage for the inlet of air when necessary.

From the foregoing description, and a study of the drawings, it will be apparent that a single air vent or check valve of the character described arranged in one of the closure caps of a hydrant will insure the proper drainage and will prevent water from escaping when the hydrant valve is opened. While the attachment is simple in construction, it is very efficient and is practically a necessity. It may be manufactured at a very low cost and can easily be installed in any hydrants now in use, without alteration other than drilling the small bore 19 and tapping out the cap for the screw-threaded end of the valve.

Obviously the present invention is not restricted to the particular embodiment thereof herein shown and described.

What is claimed is:—

1. In combination with a fire hydrant having a control valve, a drain opening near the bottom of the hydrant above said valve, a plurality of outlets and a cap for each outlet; a vent valve in one of the caps, said cap having a vent opening therein, said vent valve comprising a body portion adopted to be screw-threaded in to the inner end of the vent opening in the cap and projecting inwardly therefrom; said body portion having a longitudinal bore through its outer end and in communication with the vent opening in the cap and having a larger bore through its inner end; a valve seat formed between the two bores; and a valve in said larger bore adapted to co-act with said valve seat.

2. In combination with a fire hydrant having a control valve, a drain opening near the bottom of the hydrant controlled by said valve, a plurality of outlets and a cap to close each outlet, one of said caps having a vent opening extending therethrough; and a ball valve to control said vent opening, said ball valve being adapted to open inwardly whereby air is admitted to the hydrant to permit the water to drain by gravity therefrom through the drain opening when the control valve is closed and all of the outlets are covered by the caps, said ball valve also being adapted to close to prevent the passage of water through the vent opening when the control valve is open and any one of the caps removed.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JAMES R. CARNES.