W. Y. STEWART.

EXPANSION CONTROL DEVICE FOR ELASTIC VALVES.

APPLICATION FILED FEB. 8, 1916.

1,266,340. Patented May 14, 1918.

FIG I

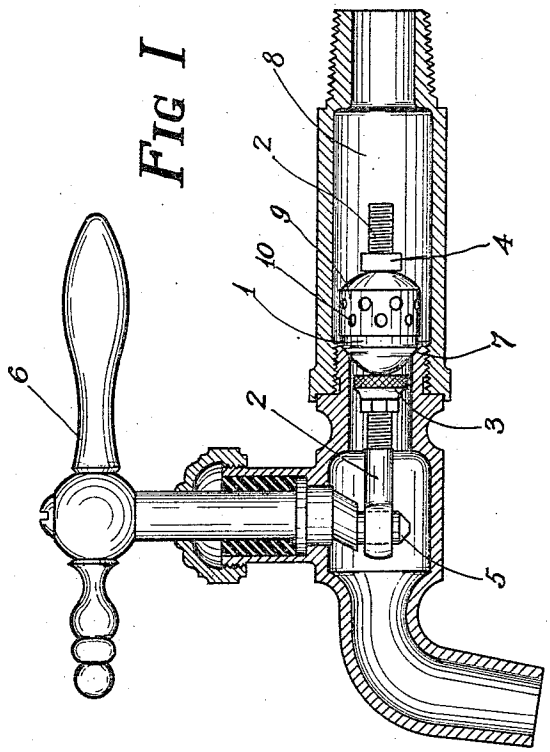


FIG V

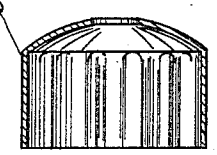


FIG IV

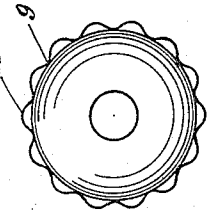


FIG III

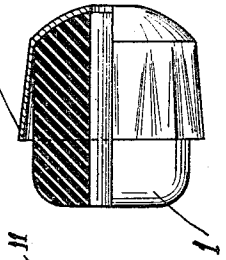
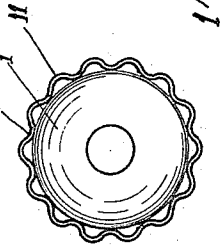


FIG II



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UNITED STATES PATENT OFFICE.

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EXPANSION-CONTROL DEVICE FOR ELASTIC VALVES.

1,266,340. Specification of Letters Patent. Patented May 14, 1918.

Application filed February 8, 1916. Serial No. 77,062.

To all whom it may concern:

Be it known that I, WILLIAM Y. STEWART, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Expansion-Control Devices for Elastic Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to valves for shutting off the flow of liquids and particularly to those valves composed of elastic or expansible material and has for an object to provide means for permitting normal expansion of the valve and preventing abnormal expansion thereof.

With this and other objects in view the invention comprises certain novel constructions, combinations and arrangements of parts as hereinafter more fully described and claimed and as illustrated in the accompanying drawings in which like characters of reference indicate corresponding parts throughout the several views and in which—

Figure I is a longitudinal vertical section of an ordinary Fuller cock showing the usual elastic valve with one form of cap, constructed in accordance with this invention, positioned upon the same.

Fig. II is a front elevation of such a valve with another form of cap, constructed in accordance with this invention, positioned thereon.

Fig. III is a side elevation, partly in section, of the valve and cap shown in Fig. II.

Fig. IV is a rear elevation of the cap of the form shown in Figs. II and III.

Fig. V is a vertical longitudinal section of the cap of the form shown in Figs. II, III and IV.

In the ordinary Fuller cock the valve is composed of rubber or a composition similar thereto and is, in shape, approximately cylindrical with rounded ends. It is ordinarily referred to as the "Fuller-ball" and, for convenience will be thus referred to herein. Also, while these cocks may be used for any liquid the general use is for water and in these specifications I shall use the word water as representing any liquid for which the cock may be used.

In Fig. I of the drawings I have shown an ordinary Fuller-cock complete but the construction and operation thereof is so commonly understood that I shall not describe it except as it relates directly to my invention. It will be understood that the Fuller-ball 1 is mounted on rod 2 and retained at any desired point thereon by lock nuts 3 and 4 and that rod 2, at its forward end, is rotatably mounted on crank 5 which is operated by hand lever 6 for reciprocating rod 2 and drawing the ball forward against valve seat 7, as shown in Fig. I for closing the valve and shutting off the liquid, or forcing the ball back away from the valve seat 7 for opening the valve and allowing the liquid to flow forward therethrough from chamber 8.

It will be noted that the body of the Fuller-ball is at all times within the water chamber 8 and thus is at all times submerged in the water therein and subject to the action thereof.

In closing the valve the ball is drawn against the valve seat with sufficient force to insure the closing of the valve. The pressure thus exerted upon the ends of the ball (by the valve seat 7 at the front end and by lock nut 4 at the rear end) causes the ball to expand sidewise to some degree. This I term the normal expansion as it results naturally from the ordinary operation of the valve.

In addition to this normal expansion the action of the water, and especially hot water (for which Fuller-cocks are very commonly used) causes a swelling or abnormal expansion of the ball which, if the swelling be not checked, will finally enlarge to such an extent that it will substantially fill the portion of chamber 8 surrounding the ball resulting in practically shutting off the flow of water past the ball at all times, such swelling being accompanied with a loss of the normal elasticity of the ball so that it does not resume its normal shape when relieved of the pressure of the nut 4 and the valve seat 7.

This swelling or abnormal expansion of the ball causes much trouble and expense in keeping Fuller-cocks in repair. I am aware that caps of metal have been used for inclosing portions of the Fuller-ball for preventing expansion thereof but such caps are so constructed that the normal expansion of the portion of the ball within the cap is prevented as well as the swelling or abnormal expansion.

In order to limit this swelling or abnor-

mal expansion and maintain sufficient space around the ball to insure a sufficient flow of water at all times and at the same time provide for the normal expansion of the ball, I provide a cap 9 of any sufficiently stiff or substantial material, designed to inclose the rear end and a substantial portion of the body of the ball, preferably more than half thereof. The cap is preferably designed to fit the ball snugly but in the walls of the cap I provide means such as perforations 10 or flutings or corrugations 11 whose raised ribs leave spaces for permitting some expansion of the ball therein and these spaces are to be large enough to accommodate within them the ordinary or normal sidewise expansion of that portion of the ball which lies within the cap. The number and size of the perforations or flutings or other similar spaces will be determined by the size of the ball, its qualities, especially its elasticity, the amount of pressure to which it will be subjected in closing the valve and other factors which would determine the normal expansion of the ball.

By this means provision is made for permitting the normal expansion of the ball throughout its length thus retaining and utilizing the elasticity of the entire ball whereas were the cap to fit the ball closely at all points the elastic action of the ball would be limited to the small portion thereof in front of and outside of the cap necessitating greater pressure on the ball to insure a tight fit in the valve seat, resulting in greater wear upon the ball and necessitating more power to close the valve and thus making the operation of the valve more difficult.

My invention is primarily designed for use in Fuller-cocks of the ordinary and usual shapes and sizes and its construction is such, as clearly shown in the drawings, that it may be placed upon the ball in any Fuller-cock of ordinary design without any change in such ball or any other portion of the cock.

I claim—

1. A cap for a Fuller-cock valve having corrugations in the walls thereof.

2. A cap for inclosing a portion of an elastic valve and preventing abnormal swelling thereof and having corrugations formed therein for permitting elastic action of the valve within the cap.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM Y. STEWART.

Witnesses:

CARLE WHITEHEAD,

WALTER C. BRINKER, Jr.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."