G. M. BARD.

VALVE.

APPLICATION FILED AUG. 1, 1907.

958,716. Patented May 24, 1910.

Fig. 1.

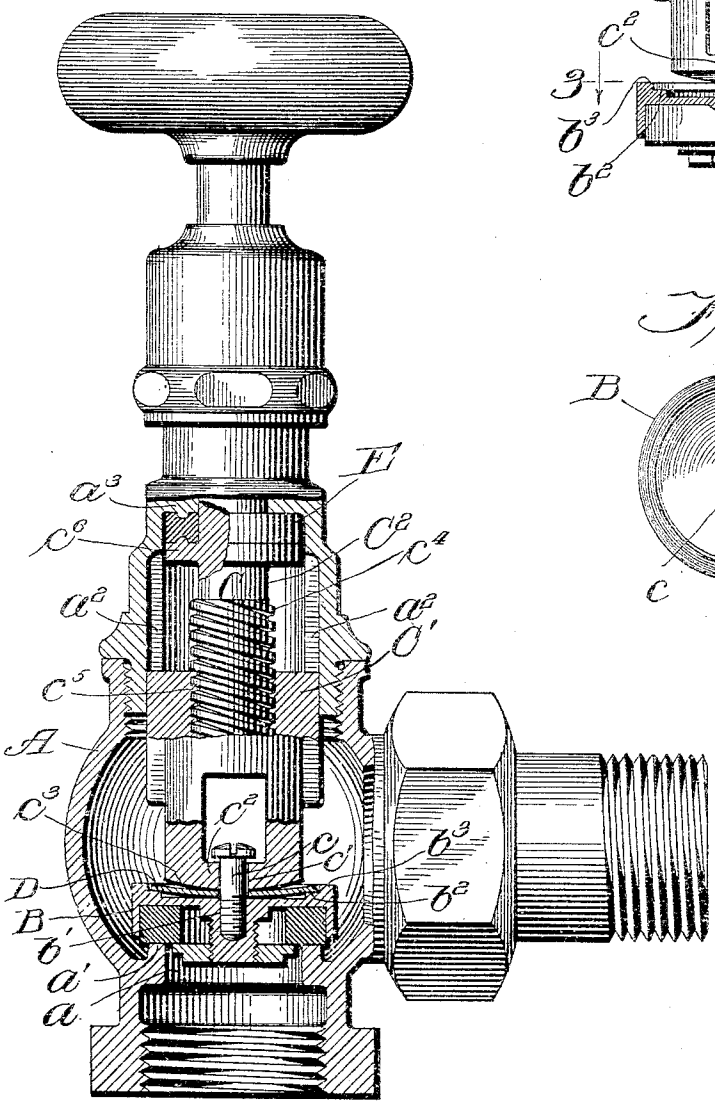


Fig. 2.

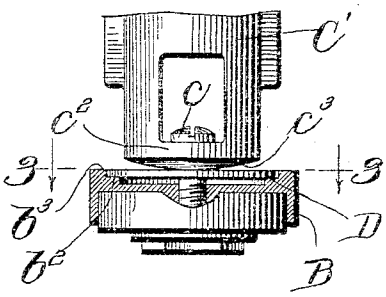
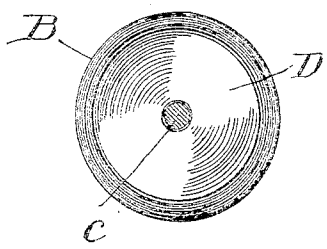


Fig. 3.



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UNITED STATES PATENT OFFICE.

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VALVE.

958,716. Specification of Letters Patent. Patented May 24, 1910.

Application filed August 1, 1907. Serial No. 386,559.

To all whom it may concern:

Be it known that I, GEORGE M. BARD, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Valves, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to valves and has for its object to improve the same.

In valves employed in steam pipes or in other places wherein they are subjected to varying temperatures, it often happens that, even though the valve be tightly seated, it will afterward become sufficiently loose upon its seat to permit leakage; this unseating being due to a change in temperature within the valve casing which causes contraction of the valve stem.

It is the purpose of my invention to provide means, whereby after a valve has once been seated, it will remain in that condition indefinitely irrespective of variations in temperature.

To the above end my invention consists in the interposition of a resilient member between the valve seat and that portion of the valve casing or other fixed member which serves as the abutment or support for the valve operating means. By this arrangement, when the valve is closed or seated with a pressure sufficient to prevent leakage, the resilient member is put under tension, so that any contraction of the parts due to lowering temperature or otherwise will fail to affect the seating of the valve because of such tension.

My invention may be carried out in various forms, and I have found that a very satisfactory form consists in placing between the valve proper and its operating stem a spring member which is placed under tension when the valve is forced against its seat and which, upon contraction of the valve stem, operates to maintain the valve seated due to the tension under which it has been placed.

My invention will be more fully understood, and its various objects and advantages will be more clearly apparent from the following detailed description taken in connection with the accompanying drawing. The various features of novelty which characterize my invention will, however, be pointed out with particularity in the appended claim.

In said drawing Figure 1 shows, partly in side elevation and partly in cross-section, a valve arranged in accordance with a preferred form of my invention; Fig. 2 is a view showing the valve proper and a portion of the stem, showing the condition of the resilient member when the valve is in an unseated position; Fig. 3 is a view taken on line 3—3 of Fig. 2 looking in the direction of the arrows.

In the drawing I have illustrated my invention as taking the form wherein there is a slight lost motion between the valve and its operating stem, so that a spring plate placed between the valve and the stem may be placed under tension when the valve is forced against its seat; and in the following description reference will be had particularly to this specific construction. It will, of course, be understood, however, that my invention is not limited to this one form.

Referring to the drawing, A indicates a valve casing having a port a and a valve seat a' surrounding the port.

B is a valve adapted to engage the seat so as to close the port.

C is an operating stem for the valve. The stem is connected to the valve in any convenient manner, as by means of a screw c which passes loosely through an opening c' in the lower end of the stem and is screwed into the valve as at b'. The distance between the lower surface of the screw head and the top of the valve is somewhat greater than the thickness of the wall c^2 in the stem through which the screw passes. Space is thus provided for the interposition of a resilient member between the lower end of the valve stem and the top of the valve, which member may be compressed so as to be placed under tension upon continuing the downward movement of the valve stem after the valve has come into engagement with its coöperating seat. The resilient member may conveniently take the form of a flat spring plate D which rests upon an annular shoulder b^2 projecting upwardly from the upper surface of the valve. The lower end of the valve stem which engages the plate D is preferably slightly convexed as shown

at c^3. When the valve is open, the spring plate, bearing against the lower end of the valve stem, draws the screw outwardly or downwardly until its head engages with the wall c^2. When the valve is seated the stem is permitted to continue its inward or downward motion a short distance, but in so doing it flexes the resilient plate so that the valve is held seated under spring pressure. Therefore, if the valve is seated while the parts are hot and they are then allowed to cool so as to contract, the lower end of the stem may be drawn upward slightly; but the middle portion of the spring plate will follow, while, at the same time, the edge of the plate will maintain pressure upon the annular shoulder and thereby prevent the valve from leaving its seat. By properly proportioning the parts, a reliable closure may be effected and maintained without danger of leakage even though the temperature of the parts may afterward be greatly reduced. The top of the valve is preferably provided with a second annular shoulder b^3 above and surrounding the shoulder b^2, whereby a recess is formed within which the resilient plate is inclosed.

The form of the valve stem and the connection between it and the casing may be varied as desired, since the present invention, in its broader aspects, is not dependent upon any particular arrangement of actuating means. However, by employing an arrangement of operating means such as shown, a further function of the spring plate is obtained. Thus the valve stem is shown as made of at least two parts, a lower part C′ slidably mounted within guideways a^2 within the casing and an upper part C^2 revolubly mounted within the casing, but held against axial movement therein. The part C^2 is provided with screw-threads c^4 which engage the screw-threaded interior c^5 of the part C′. Upon rotating the part C^2, the part C′ is drawn upwardly or is forced downwardly depending upon the direction of rotation, thus unseating or seating the valve. The part C^2 is provided with an annular flange c^6 between which and an annular shoulder a^3 upon the casing there is arranged a suitable packing ring E.

It will be seen that as soon as the spring plate D is placed under a tension, it not only forces the valve down but it exerts an equal upward pressure on the stem and thus forces the flange c^6 and the ring E firmly against the shoulder a^3.

Having now fully described my invention, what I claim as new and desire to secure by Letters Patent is:

In combination, a valve having a recessed upper surface, a valve stem having a perforated wall arranged above said valve, a headed stud carried by said valve and extending through the perforation in said wall, the distance between the head of the stud and the bottom of the recess in the valve being greater than the thickness of said wall, and a resilient plate arranged between said wall and said valve and spanning said recess.

In testimony whereof, I sign this specification in the presence of two witnesses.

GEORGE M. BARD

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