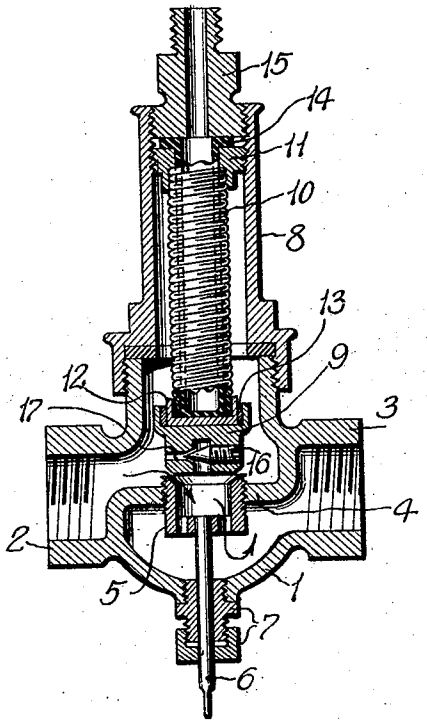
J. W. BARTON.

PRESSURE VALVE.

APPLICATION FILED JUNE 2, 1919.

1,414,323. Patented Apr. 25, 1922.



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PRESSURE VALVE.

1,414,323. Specification of Letters Patent. Patented Apr. 25, 1922.

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To all whom it may concern:

Be it known that I, JOHN W. BARTON, a citizen of the United States of America, residing at Flint, in the county of Genesee and State of Michigan, have invented certain new and useful Improvements in Pressure Valves, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in valves adapted to control a passageway and wherein the position of the closure relative to its seat is controlled by fluid pressure normally active in such control.

The invention is designed more particularly for use in connection with systems wherein a pressure condition is set up beyond the closure in the presence of a supply through the passageway, this pressure being made effective on the closure in such manner as to vary the position of the closure relative to its seat; and this variation in pressure may be provided by variations in temperature conditions within the pressure-producing portion of the system. One embodiment of use of the valve herein disclosed, is to be found in its installation as the controlling device for vulcanizing moulds and plates or boilers, a use to which the invention is especially applicable.

For instance, vulcanizers for molding and curing tires are generally in the form of casings for containing water, the casing having faces of molding characteristics, the water compartment having the characteristics of a steam generator or boiler, steam generation being provided by the use of a suitable fluid or gas in a suitable burner. It is desirable that the temperature of the molds be maintained as uniform as possible, and this can be controlled by regulating the steam pressure by regulating the burner flame through controlling the supply of fuel. For this purpose the present invention is particularly applicable, owing to the fact that the closure operating means is placed under the control of the steam pressure, the closure itself operating to control the passageway for the fuel. Obviously, control of this kind needs to be sensitive in character, since small variations in pressure may represent considerable variation in temperature conditions, thus tending to affect the character of the work being done by the apparatus.

Another feature of the invention is to provide a construction which will, in the presence of an accident in the controlling means, operate to automatically seat the closure and thus avoid difficulty in the apparatus.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

The drawing is a view in longitudinal section, partially broken away and in elevation, of a valve that embodies features of the invention.

As herein shown in a preferred form, a casing 1 has an intake nipple 2 and an outlet boss 3 separated by a wall 4 in which a valve-seat bushing 5 is screw-threaded or otherwise axially adjusted by means of a manually operable stem 6 connected thereto and arranged with a suitable packing gland 7 to avoid leakage. This provides the fuel or fluid passageway which, when used for the purpose above described, leads to the burner.

A bonnet 8 is screw-threaded onto the casing in substantially axial alignment with the sleeve 5. A closure 9 for the seat on the bushing 5 is retracted normally therefrom by a helical spring 10, that is secured to a threaded ring 11, inserted in the upper portion of the bonnet. A cap 12 on the lower end of the spring is cemented or joined to the closure 9 by wax or other material, indicated at 13, which softens under heat.

A chamber is formed within the spring 10 by a sack 14 of extensible fabric, such as rubber or the like, the upper margin of which is clamped between the ring 11 and a nipple 15, screwed into the bonnet 8, which is likewise a connection whereby communication may be established between the interior of the sack 14 and the pressure-producing instrumentality—the steam-space in the particular embodiment referred to, thus providing an open communication with such space.

An adjustable plug 16 may regulate flow through a by-pass 17, in the closure, so that, regardless of the position of the closure, there may be always a regulatable, minimum flow through the valve.

Normally, sack 14 will be filled with water of condensation (the sack providing a closed

end to the line of communication with the steam space), thus retaining the sack free from steam temperature, the contents, however, being subject to the steam pressure of the generator or boiler.

In operation, the spring 10 normally retains the closure in its open position, and until the power of the spring is overcome, the closure will remain in this position. The change is provided by the value of the pressure placed on the sack 14 or its contents. Increase in pressure within the generator or boiler increases pressure on the sack or its content, and since the latter practically fills the interior of the spring 10, the effect of the pressure increase is to elongate the sack, thus moving the closure toward its seat and reduce the fuel amount passing through the fuel passageway, cutting down the flame and affecting the steam generating ability to decrease the pressure. This action takes place whenever the pressure increases beyond the desired maximum, the maximum being set by the position of nipple 15 in barrel 8, adjustment of the nipple permitting variation in the distance between the closure and its seat to control the maximum amount of fuel which passes through the fuel passageway.

Should conditions arise which would disrupt the sack 14, the steam pressure would drive out the content of the sack and permit the steam to enter the sack and discharge through the break, thus producing temperature conditions within the valve itself such as would soften the wax retaining means 13 and permit the closure to drop to its seat by gravity. Repairs are then made by substituting a new sack 14.

It will thus be understood that I have provided a valve construction of simple and efficient character, in which the pressure-production value can be controlled by controlling the supply of the means for producing the pressure by making the closure directly responsive to the variations in pressure produced, and this result is obtained by a structure sufficiently sensitive to maintain the variations in pressure comparatively small. This sensitiveness is obtainable by the use of the sack 14 which is subject to small variations and which, by its mounting translates these variations into linear movement applied directly to the closure itself.

Obviously, the invention is not limited to its use with the specific embodiment referred to, that being more or less illustrative of the installation of the valve for use as a controlling medium in other relations.

It will be understood, of course, that the valve herein disclosed may be considered as having characteristics of an indirect thermostatic action, in that the pressure effective in the expansion of the sack 14 is controlled by the heat value effective in setting up the conditions of pressure, the heat value being controlled by the amount of fluid passing through the valve to the burners. It will be understood, however, that the mere presence of heat within the sack will not set the sack into motion to obtain the desired sensitiveness, the action being by pressure rather than by the presence of heat in the sack itself.

Obviously changes in the detail of construction may be made without departing from the spirit of the invention, and I do not care to limit myself to any particular form or arrangement of parts.

What I claim is;

1. In a valve, a seat, a shiftable closure therefor, means normally operative to yieldably retract the closure from the seat, and a chamber-forming element housed by said means and normally free from operative connection with the passageway controlled by the closure, said element being adapted to be connected to a source of and expanded by internal fluid and arranged to force the closure to seat in opposition to the yieldably retracting means.

2. In a valve, a seat, a shiftable closure therefor, means adapted to yieldingly retract the closure from the seat, and an extensible chamber housed by the retracting means and adapted to seat the closure against the influence of the retracting means when extended by internal pressure of fluid.

3. In a valve, a seat, a closure therefor, yieldable means adapted to retract the closure from the seat normally, an extensible chamber adapted to force the closure to seat against the action of the yieldable means under the influence of pressure, and a connecting medium between the closure and retracting means adapted to release the closure to seat itself when disruption of the chamber exposes the medium to heat above the normal temperature under which the valve is arranged to operate.

4. In a valve, a seat, a shiftable closure therefor, a spring adapted to retract the closure from the seat normally, and an extensible chamber within the spring adapted to force the closure to seat against the spring action under the influence of internal fluid pressure.

5. In a valve, a seat, a closure therefor, a spring adapted to retract the closure from the seat normally, an extensible chamber adapted to seat the closure against the action of the spring under the influence of fluid under pressure, and means connecting the closure to the spring adapted to release the closure to seat itself when disruption of the chamber exposes such means to a temperature above the normal.

6. In a valve, a casing having an inlet and outlet separated by an internal wall, an apertured valve seat adjustably secured in the wall, a shiftable closure for the seat,

a spring mounted in the casing and adapted to retract the closure from the seat normally, and an extensible chamber in the casing housed by the spring and adapted to force the closure to seat against the action of the spring when under a predetermined fluid pressure in the chamber.

7. In a valve adapted to control a passageway from a pressure-production source, a closure seat within the passageway, a shiftable closure therefor, means for yieldingly retaining the closure in an open position, and means housed by and separable from said retaining means and responsive to pressure variations for varying the position of the closure relative to its seat, said latter means including an expansible bag-like element mounted to have its interior in open communication with the pressure-production source.

8. A valve as in claim 7 characterized in that the bag-like element is mounted to substantially limit its maximum expansion to the direction of closure movement.

9. A valve as in claim 7 characterized in that the bag-like element is housed by the closure retaining means in a manner to substantially limit the element maximum expansion to the direction of closure movement.

10. A valve comprising a body providing a valve chamber, a valve seat in said chamber, a valve element, a contractible coil spring secured to the body and supporting the valve element, and a hollow rubber expansion element having one end closed and the other secured to the body, said expansion element extending longitudinally into the coil spring and adapted to expand transversely to engage the spring convolutions and longitudinally with the spring to translate the valve element.

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

JOHN W. BARTON.

Witnesses:

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