June 5, 1923. 1,458,064

A. KUSHLAN

BLOW-OFF VALVE

Filed Nov. 22, 1920 2 Sheets-Sheet 1

FIG. 1.

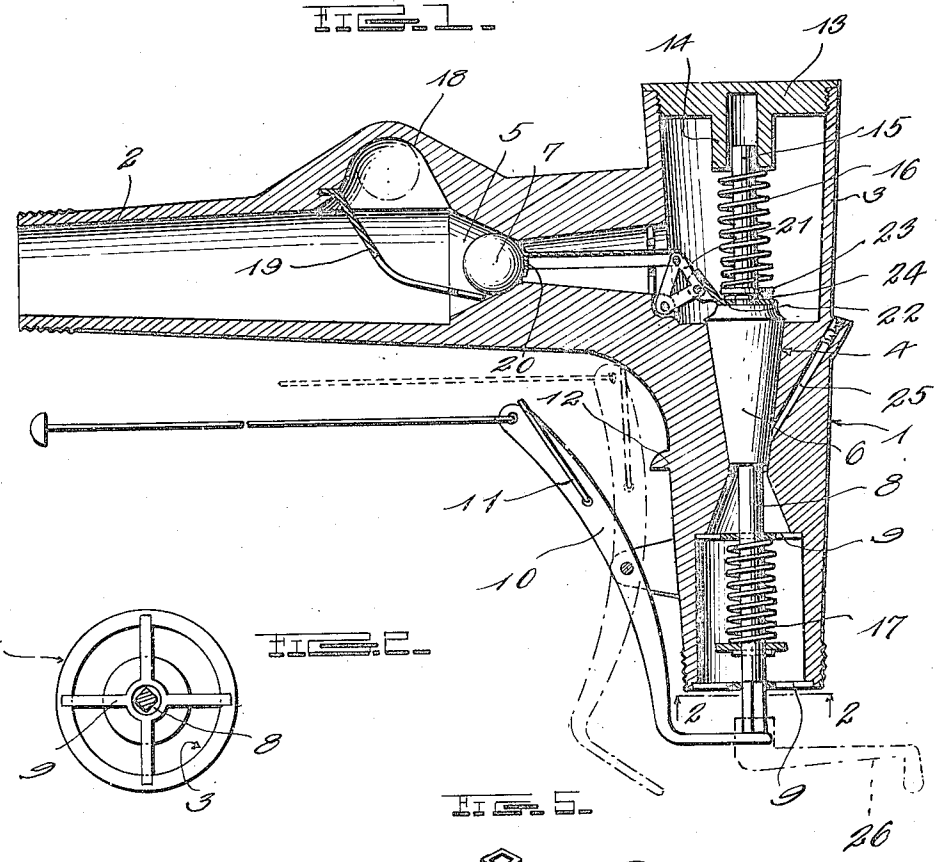


FIG. 2.

FIG. 5.



FIG. 3.

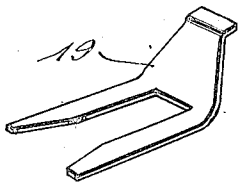
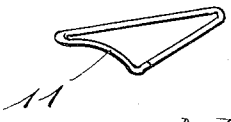


FIG. 4.



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FIG. 6.

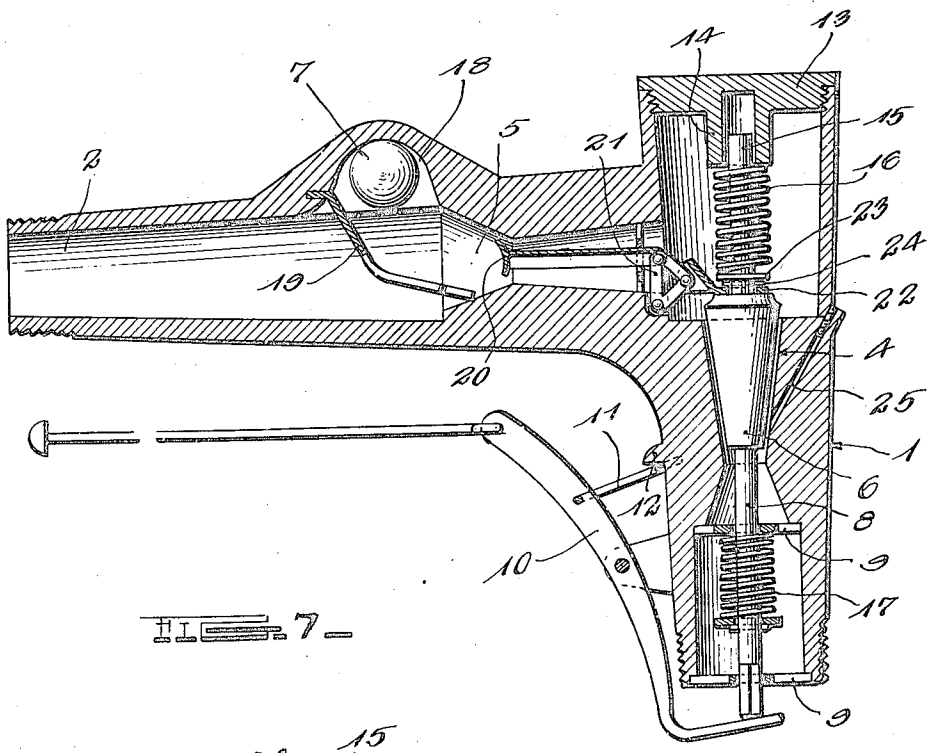
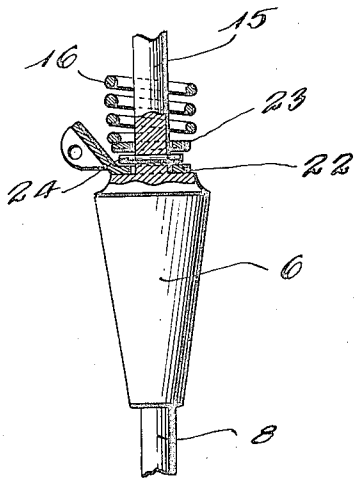


FIG. 7.



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UNITED STATES PATENT OFFICE.

ANTON KUSHLAN, OF BROWNSVILLE, PENNSYLVANIA.

BLOW-OFF VALVE.

Application filed November 22, 1920. Serial No. 425,812.

To all whom it may concern:

Be it known that I, ANTON KUSHLAN, a citizen of the United States, residing at Brownsville, in the county of Fayette and State of Pennsylvania, have invented certain new and useful Improvements in Blow-Off Valves; and I do 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 an improved blow-off valve which is especially, although not necessarily, designed for use on steam engine boilers.

The principal object of the invention is to provide a valve of this class which is such that it serves to permit the boiler to be drained, after which, by attaching a hose or the like to this valve, permits the boiler to be refilled with fresh water.

Another object of the invention is to provide a valve of this type embodying valved passages in which the valves are normally closed, but are at the same time both moved to open position by the pressure of the fluid being supplied to the boiler through the hose, there being manually actuated means for positively and simultaneously opening these valves in case it is desired to drain the boiler.

A further object of the invention is to provide a blow-off valve wherein the operating lever is such that it may be swung entirely out of the way to permit quick attachment of the hose.

A still further object of the invention is to provide a blow-off valve embodying a manually controlled valve and a second valve, there being coacting means between the first named valve and the said second valve for unseating the latter when the former is opened, and said coacting means being such as to permit said manually controlled valve to be rotated on its seat to grind this seat.

Still another object of the invention is to provide a valve of this class including a fluid controlled valve in the form of a ball check valve, the passage in which this valve is located, including a pocket and track leading to this pocket, so that when the boiler is being filled, the check valve will be moved into this pocket and the possibility of obstructing the free flow of liquid overcome.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a central vertical sectional view through a valve constructed in accordance with this invention, the valve being shown closed.

Figure 2 is a view taken on the line 2—2 of Fig. 1, looking in the direction of the arrows.

Figures 3 and 4 are perspective views of two of the details of the device.

Figure 5 is a perspective view of a crank-handle to be used on the valve stem for grinding one of the seats.

Fig. 6 is a view similar to Fig. 1, the valve being shown open.

Fig. 7 is an enlarged view of the conical valve and adjacent parts.

Referring to the drawings, wherein the preferred embodiment of my invention is clearly illustrated, the numeral 1 designates a body which includes communicating passages 2 and 3, the last named passage being open at its lower end and being internally thickened intermediate its ends to provide a substantially conical valve seat 4. I also thicken the metal of the wall of the first named passage so that another substantially conical valve seat 5 is provided. It is to be noted that the last named valve seat is so formed that the amount of fluid passing therethrough will be restricted. A conical valve 6 co-operates with the seat 4, while a ball check valve 7 co-operates with the remaining seat. As before intimated, these valves 6 and 7 are both manually operated in some instances and are opened in other instances by the fluid which is being supplied to the boiler for the purpose of refilling the latter. In order to permit the valve 6 to be operated manually, it is equipped with a depending stem 8 which passes through guide 9 arranged in the lower end of the passage 3. The free end of this stem projects beyond this passage and the laterally bent end of a pivotally mounted operating lever 10 serves to force it inwardly in order to unseat the valve by which it is carried. Operating lever 10 may be of any suitable construction, being preferably of the shape shown, so that it may be swung to the dotted line position, whereby the end

which coacts with the stem 8 will be swung entirely out of the way to permit attachment of a hose (not shown) to the screw-threaded body portion at the lower end of the passage 3. While on the description of this lever, it is well to state that it will be equipped with a suitable locking member 11, this member being intended to be positioned against the exterior surface of the body portion surrounding the passage 3 below the shoulder 12 in order to retain the lever in such a position that the valve 6 will be held open. Close examination of the construction of the passage 3 will disclose the fact that the body portion at the upper end of the passage is internally screw-threaded to permit a screw-cap 13 to be used for closing said upper end, this screw-cap in its preferred form including a central depending guide 14 into which the free end of a rod 15 is received, this rod being carried by the valve 6. At this point I may mention that both the rod 15 and the stem 8 are surrounded by coiled springs 16 and 17 respectively, which serve to automatically close the valve 6 and retain it in extremely tight contact with its seat.

Now by referring to the other passage 2, it will be seen that this passage is provided with a recessed enlargement 18 constituting a pocket into which the ball valve may move when the boiler is being refilled with fresh water. It is obvious that since this valve must necessarily be fairly large, it would have a tendency to obstruct the free passage of water into the boiler. However, by providing this pocket, this valve may move into it and be entirely out of the way so that the free passage of fluid will be insured. It is also obvious, that so long as water is passing through this passage, this valve will remain in the pocket. However, as soon as the flow of water stops, the valve, due to its own weight, will automatically close, that is, it will assume its normal position. To prevent the water under pressure from driving this valve into the boiler, as might otherwise occur, I provide a novel track or guide member 19 which is positioned in such a manner as to cause the valve to move into the pocket. By referring to Fig. 3 an idea of the construction of this member may be obtained. In this figure, it will be seen that the member is so constructed that it permits the free flow of water through the passage 2 and at the same time it provides a novel means for guiding this ball valve into the pocket in the manner above set forth.

It is desirable to have both of the valves operate simultaneously or substantially so in both instances. To this end, I make use of a plunger 20 which is adapted to extend through the valve-seat 5 to engage the ball valve 7 for the purpose of unseating this valve. This plunger is connected to the rod 15 through the medium of a suitable linkage, being here shown as consisting of a pivotally mounted bell-crank lever 21 connected to a ring-like member 22 through which the rod 15 is freely slidable. It is to be noted that the rod 15 is provided with a removable shoulder 23 held against movement in one direction by a pin 24, and when the device is in use, the ring-like member 22 abuts this shoulder. This particular construction is employed to permit free rotation of the valve 6 for the purpose of grinding its seat. In other words, with this construction, it will be seen that by attaching the crank handle 26 to the non-circular end of the stem 8, and rotating it, the valve will be in turn rotated and its seat effectively ground, free rotation of this valve and the rod 15 being permitted because of the loose connection of this rod with the actuating means for the ball valve 7. To insure effective grinding of the valve seat 4, I provide the wall of the passage 3 with an inclined support 25 through which a suitable lubricant may be introduced.

The operation of my improved blow-off valve is as follows: Assuming that it is desired to drain the boiler, it is only necessary to move the lever 10 in such a manner as to force the stem 8 upwardly. Such movement of parts will unseat the valve 6, and due to the fact that this valve imparts a longitudinal movement to the rod 15, it will be seen that the co-acting means between this rod and the ball valve 7 will impart movement to the plunger 20. Thus, the ball valve will be unseated together with the first named valve. Should it be desired to retain these valves in this open position, the locking member 11 may be swung against the outer wall of the passage 3 beneath the shoulder 12. Upon releasing this member 11 and the operating lever 10, the springs 16 and 17 will automatically seat the valve 6, and the pressure from the boiler will automatically close the check valve 7. When it is desired to refill the boiler with fresh water, the operating lever 10 will be moved to the position indicated in dotted lines, in which position the effective end thereof will be moved entirely out of the way of the lower end of the passage 3, thus permitting a hose to be conveniently attached. It is obvious, that as soon as the water under pressure enters the passage 3 it will unseat the valve 6 and the ball check valve 7. As before stated, the last named valve will, through the employment of the inclined track 19, be moved into the pocket 18, in which position it will be prevented from obstructing the free flow of the water through the passage 2.

In case leakage between the valve 6 and its seat occurs, this may be overcome by simply grinding this seat by rotating the valve 6. To do this, it is only necessary to swing

the operating lever out of the way, and attach the hand crank 26 to the non-circular free end of the stem 8, and by rotating this stem, the valve seat 4 may be effectively ground.

While I have shown and described my improved blow-off valve as being especially designed for use in connection with steam boilers, I desire it to be understood that it is not to be restricted to this particular use, since it will effectively serve as a safety valve for any devices wherein it is found necessary to relieve excessive pressures.

A careful consideration of the foregoing description taken in connection with the accompanying drawings, is thought to be sufficient to enable persons skilled in the art to which this invention relates to obtain a clear understanding of the same, therefore, a more lengthy description is deemed unnecessary.

Effective and advantageous results are insured with the construction and arrangement herein described and shown and for this reason, this construction and arrangement is taken as the preferred embodiment of my invention. However, I wish it to be understood that various minor changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

I claim:

1. A blow-off valve for draining a boiler or supplying fresh water thereto comprising a body having two communicating valved passages, the valves being normally closed but movable to open position under the pressure of fluid being supplied to the boiler, and manually actuated means for positively and simultaneously opening the valves and retaining them in open position when the boiler is being drained.

2. The structure set forth in claim 1, one of the valves carrying a pivotally mounted member which is designed to unseat the remaining valve when said one valve is opened.

3. A blow-off valve for either draining a boiler or for refilling the same with fresh water comprising a body having two communicating passages, a valve arranged in each passage, both valves being normally closed but adapted to be automatically opened by the pressure of the water when filling the boiler, manually operated means on the exterior of the body for opening the valves, and co-acting means between the valves for causing simultaneous operation thereof when the manual means is actuated.

4. The structure set forth in claim 3, together with quick releasable means between the exteriorly arranged operating means and body for holding both valves open.

5. A blow-off valve for the purpose set forth comprising a body including two communicating passages having valve seats therein, check valves for co-action with these seats, said valves being adapted to be unseated by the water when filling the boiler, and adapted to be manually unseated when draining the boiler or relieving it of excessive steam, a rod carried by one of the valves, and means between said rod and other valve for unseating the latter, said means being effective when draining the boiler or relieving it of steam and having detachable connection with said rod to permit said one valve to be removed from the body for making repairs.

6. A blow-off valve comprising a body having two passages communicating with one another and provided with valve seats, fluid actuated check valves for cooperation with said seats, manually operated means for unseating one of the valves, a stem carried by said one valve, a plunger arranged in one of said passages for unseating the remaining valve when it is actuated, and linkage connecting said plunger with said stem for operating said plunger when said first named valve is unseated.

7. A blow-off valve comprising a body provided with two communicating passages having valve seats therein, valves for co-operation with said seats, said valves adapted to be controlled by manually operated means or automatically controlled by the fluid, a stem carried by one valve, a plunger arranged in one of said passages for unseating the remaining valve, a bell crank pivoted in said one passage, said plunger being connected with one of the arms of said crank, a ring surrounding said stem and having pivotal connection with the remaining arm of said bell crank, and means for securing said ring on said stem.

8. A blow-off valve comprising a body provided with a passage having a valve seat, a valve arranged in the passage and co-operative with the seat, a stem carried by the valve and extending through said passage and beyond one end of the body, a spring for automatically closing said valve, a lever pivoted on the body and having a laterally directed end co-operative with the exposed end of said stem, means for actuating said lever to bring it into engagement with said stem for opening the valve, the free end of the stem being flat-faced to permit connection of a hand crank therewith, and said lever being shaped to permit it to be swung clear of said end to permit use of said crank, whereby to permit rotation of said valve against the seat for grinding the latter.

In testimony whereof I have hereunto set my hand.

ANTON KUSHLAN.