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T. M. EYNON.

BLOW-OFF VALVE.

(Application filed Jan. 4, 1898.)

(No Model.)

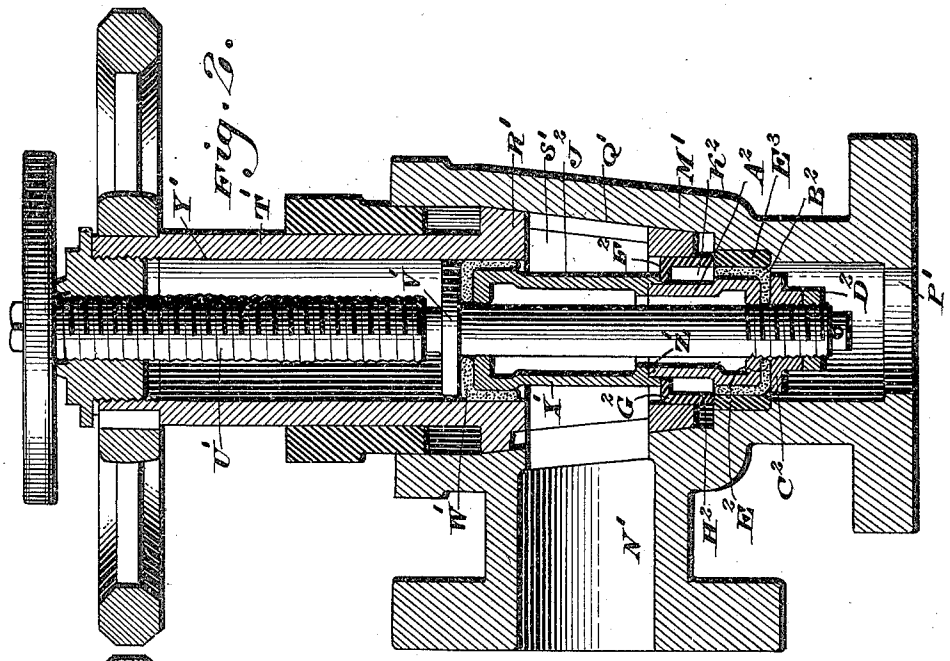


Fig. 2.

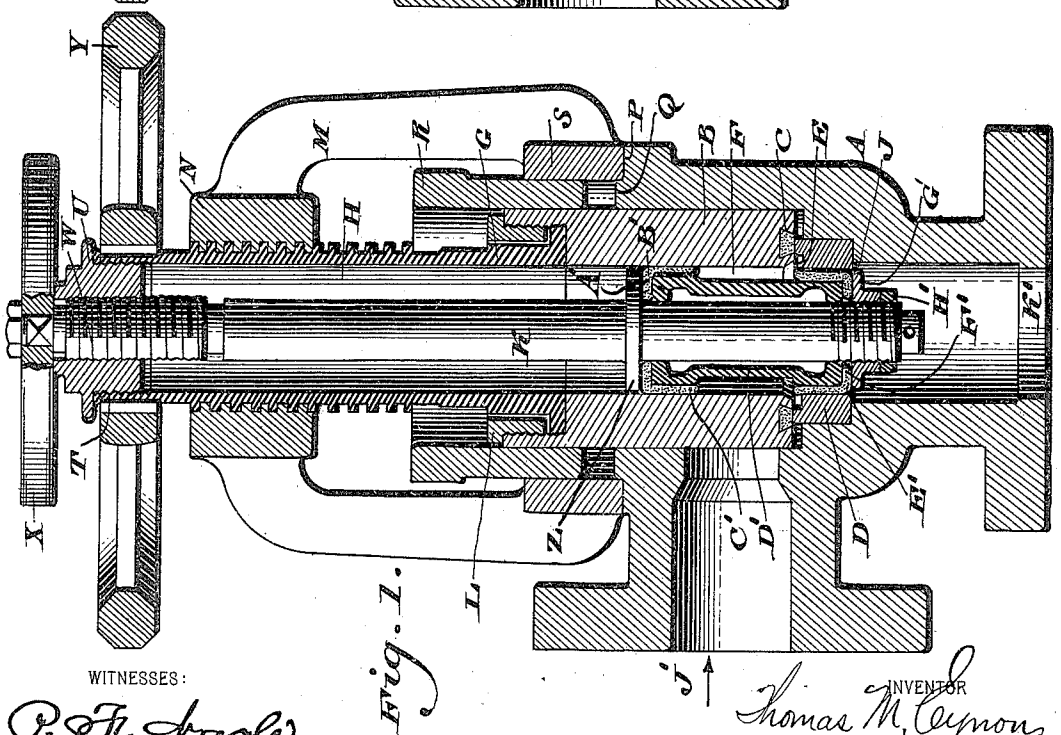


Fig. 1.

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BLOW-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 617,150, dated January 3, 1899.

Application filed January 4, 1898. Serial No. 665,534. (No model.)

To all whom it may concern:

Be it known that I, THOMAS M. EYNON, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Blow-Off Valves, which improvement is fully set forth in the following specification and accompanying drawings.

It is a well-known fact that it is an extremely difficult matter to keep a blow-off valve or cock tight under the severe conditions to which they are subjected, since the dirt, sediment, &c., which are precipitated from the water contained in the boiler and, during the action thereof, are blown out at a high velocity and the grit and other ingredients cut and score all surfaces with which they come in contact.

Various forms of blow-off valves have been heretofore devised which have failed to fulfil the requirements; but I have found that by employing cups of suitable material in conjunction with a distance-piece and other adjuncts, thereby producing a cup-fitted or auxiliary piston, I am enabled to construct a valve which is cheaply manufactured and very effective in its operation; and to this end my invention consists of an improved construction of blow-off valve the novel features of which will be hereinafter fully set forth, and particularly pointed out in the claims.

Figure 1 represents a longitudinal sectional view of a blow-off valve embodying my invention. Fig. 2 represents a longitudinal sectional view of another embodiment of the principle of my invention, showing a cup-fitted piston in combination with a plug or cock.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates a valve body or casing, the same being provided with a main valve or piston B, which has seated in its lower portion a ring C, of composition or other suitable material, said ring being adapted to contact with the valve-seat D, thereby closing the opening E.

F′ designates an opening which may be concentric with the piston B and of substantially the same diameter as the opening E.

G designates a main spindle which is provided with the opening H, whereby a practically continuous bore is attained throughout the length of said main spindle and through which the auxiliary or cup-fitted piston J, whose construction will be hereinafter described, and the connecting-spindle K may be withdrawn or replaced for the purposes of inspection or repairs. The main spindle G is connected with the piston B by means of the keeper L in such a manner that said main spindle is capable of rotation without rotating the piston B, whereby the ring C is enabled to seat or unseat vertically without any grinding motion.

M designates a yoke suitably supported upon the valve body or casing A and threaded at its upper portion N to receive the main spindle G, said yoke being preferably rigidly secured to said valve-body by any suitable means, thereby forming the joint P, as is evident, a portion of said body having a male counterbore Q, so as to fit the bore of the lower portion S of the yoke M, whereby the latter is accurately retained in position under all conditions.

R designates a gland which is adapted to be inserted between the piston B and the lower portion S of the yoke M, said gland fitting snugly therein and being provided with any suitable means for retaining it in position.

The main spindle G is internally threaded at its upper portion T and fitted with a cap-nut or plug U, which is interiorly threaded to receive the threaded portion W of the spindle K, which latter is provided at its upper portion with the hand-wheel X, while the main spindle G is provided with a hand-wheel Y. The lower end of the spindle K has a flange or shoulder Z thereon, against which is held the laterally-extending portion A′ of the angularly-shaped cup B′, which is composed of any suitable material, the depending portion C′ of the latter being adapted to contact with the walls of the bore F of the piston B, said cup B′ being held in juxtaposition with the shoulder Z by means of the distance-piece D′, whose lower portion serves to retain in position the angularly-shaped cup E′, which is composed of any suitable material, the laterally-extending flange F′ of said cup being held between the lower portion of said distance-piece

and the collar-nut G′, which latter is held in position by means of the jam-nut H′ and a split pin or other device.

J′ designates the inlet of the valve, and K′ the outlet thereof.

The operation is as follows: The valve seen in Fig. 1 is in closed position, and it will be evident that upon the rotation of the hand-wheel Y in the proper direction the main spindle G will be raised, thus unseating the ring C, while the auxiliary piston J, composed of the cups B′ E′, assembled in the manner described, can also be raised and lowered by the proper rotation of the hand-wheel X at the proper period.

The lower cup E′ is adapted to prevent any downward leakage through the outlet K′, while the upper cup B′ is adapted to prevent any upward leakage from the causes hereinabove referred to, it being apparent that the cup-fitted piston J by reason of its novel construction will intercept said leakage and prevent any improper escape of the fluid under all conditions.

It will of course be understood that in opening the blow-off valve when the parts are in the position seen in Fig. 1 the cup-fitted piston J should be raised before the main valve or piston B, and in closing said main valve should be closed before the cup-fitted piston is lowered.

It will be apparent that if at any time the cups become defective through use or for any other reason by unscrewing the cap-nut U they may be removed and new cups placed upon the spindle K, after which the parts can be again assembled, in the manner seen in Fig. 1, while the pressure is on the boiler.

In the construction seen in Fig. 2 I show another embodiment of the principle of my invention, M′ designating the valve-casing, which is provided with the inlet N′ and the discharge P′. The inner portion of the valve body or casing is provided with a tapered or similar-shaped portion Q′, in which is located the plug or piston R′, the latter having the opening S′ therethrough, terminating in the main spindle T′, which carries a hand-wheel and cap-nut similar to the one already described, said cap-nut having a threaded opening therethrough, in which is located a spindle U′, which has a flange or shoulder V′, against which is held the cup W′, similar to the cup already described, by means of the distance-piece X′, said cup moving in the bore Y′. The distance-piece X′ is counterbored to receive the end Z′ of a second distance-piece A^2, the extremity of which latter engages the cup B^2, the latter having the laterally-extending flange E^2, held between the adjacent portion of said distance-piece A^2 and the collar-nut C^2, which latter is locked by means of the jam-nut D^2, &c., in the usual manner. E^3 designates a ring seated in the body or casing M′, against which the upwardly-extending portion of the cup B^2 is adapted to contact. F^2 designates an angular-shaped ring, a portion G^2 of which is adapted to contact with the adjacent projecting edge of the distance-piece X′, while the depending portion H^2 of said ring is adapted to seat upon the ring or bushing E^3, it being of course evident that when the auxiliary piston J^2, formed by the distance-pieces and cups X′ and A^2, is moved the upwardly-extending member of the cup B^2 moves into the space K^2 within the member H^2 of the ring F^2. The operation is substantially the same as has already been described, the cup-fitted or auxiliary piston J^2 being raised before the main valve R′ is actuated, while in closing said main valve should be closed before said piston J^2 is lowered, as will be evident.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a blow-off valve, the combination of a main valve having an internal bore, a cup-fitted piston formed separate from its spindle and adapted to work in said bore, and means for enabling said piston to intercept any leakage from said main valve.

2. In a stop-cock or blow-off valve, the combination of a plug or piston having an internal bore, a cup-fitted piston adapted to work therein, a spindle upon which said cup-fitted piston is mounted, means for enabling the cup-fitted piston to intercept any leakage from said plug, and means for actuating the pistons.

3. In a stop-cock or blow-off valve, the combination of a taper plug or piston constructed with an internal bore, and adapted to receive a cup-fitted piston, a spindle for the latter formed separate therefrom, means for lowering and raising said pistons, and means for removing the cups of said auxiliary piston according to requirements.

4. In a blow-off valve, the combination of a valve-body having a main piston therein, a main spindle for raising and lowering said piston, a cap-nut or plug located in the upper portion of said spindle, a cup-fitted piston movable within the bore of said main piston, a stem for said cup-fitted piston having a threaded portion for engaging said plug, and means for actuating said stem and spindle.

5. In a blow-off valve or cock, a body portion, a ring or valve-seat D located therein, a main piston B movable within said body, and adapted to seat in said ring, a main-valve stem or spindle for raising and lowering said piston, a plug or cap-nut located in the upper portion of said main stem, an internal piston located within said main piston and having a threaded stem passing through said cap-nut, a shoulder on said last-mentioned stem, said internal piston consisting of a cup adapted to contact with said shoulder, a distance-piece having one end adapted to hold said cup in position, a lower cup adapted to contact, with the lower extremity of said distance-piece, and means for holding said cups and distance-piece in assembled position.

6. In a blow-off valve, a valve-body pro-

vided with a male counterbore, a yoke having a lower portion into which said counterbore projects, a gland located within said lower portion of said yoke, a main valve or piston movable within said gland, and body, and a cup-fitted piston adapted to be moved independently of said main piston.

7. In a blow-off valve or cock, the combination of a main valve or piston, an internal cup-fitted piston, a spindle for each piston formed of a part separate therefrom and means for enabling said internal piston to intercept any leakage from the main valve.

8. In a blow-off valve, the combination of a valve-body, a taper plug contained therein, an auxiliary piston composed of cups and distance-pieces, means for holding the latter in juxtaposition, an angular-shaped ring adapted to contact with said distance-pieces and means for actuating said ring.

9. In a blow-off valve, the combination of a main valve or piston with an internal cup-fitted valve or piston, a spindle formed independently thereof, means for independently actuating said pistons and means for enabling the cups of said internal piston to be removed and replaced according to requirements.

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Witnesses:
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