T. F. CLARK.

BLOW-DOWN VALVE FOR BOILERS.

APPLICATION FILED AUG. 31, 1914.

1,126,395. Patented Jan. 26, 1915.

Fig. 1

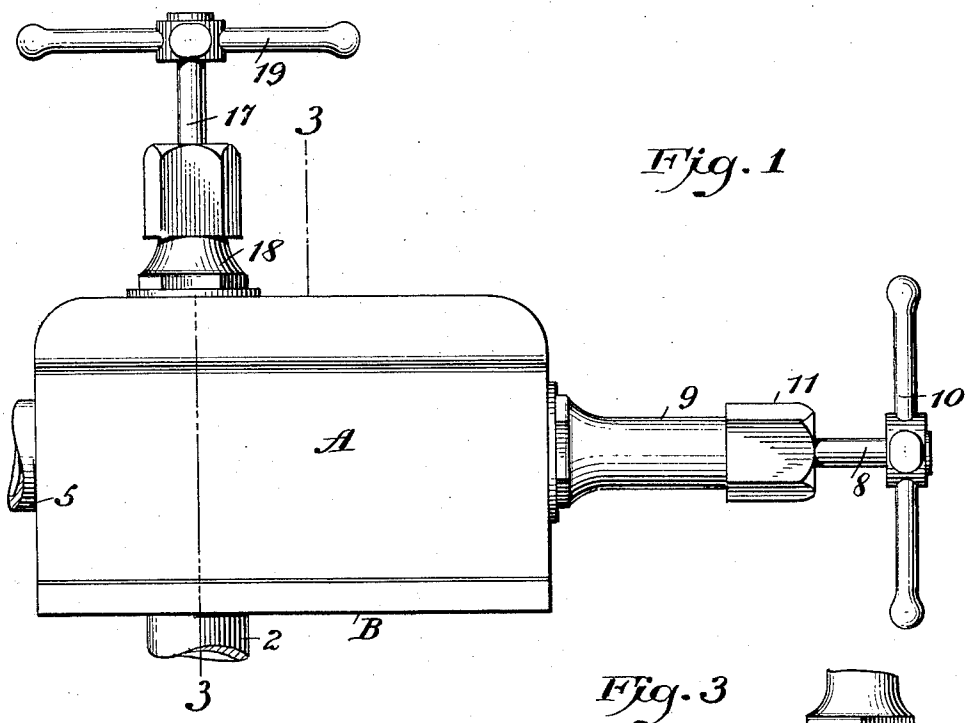


Fig. 3

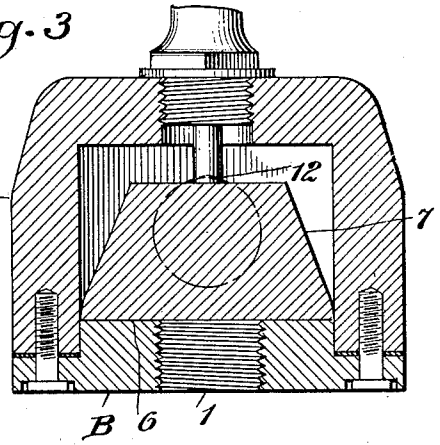


Fig. 2

Fig. 4

WITNESSES

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BLOW-DOWN VALVE FOR BOILERS.

1,126,395. Specification of Letters Patent. Patented Jan. 26, 1915.

Application filed August 31, 1914. Serial No. 859,417.

To all whom it may concern:

Be it known that I, THOMAS F. CLARK, a citizen of the United States, and a resident of West Hoboken, in the county of Hudson and State of New Jersey, have invented a new and Improved Blow-Down Valve for Boilers, of which the following is a full, clear, and exact description.

This invention relates to a blow-down valve, specially adapted for use in connection with boilers, whereby the collection of sediment in the bottom of a boiler or on the crown sheet can be periodically blown off, for the purpose of keeping the boiler in its high state of efficiency.

The invention has for its general objects to improve and simplify the construction and operation of blow-down valves, so as to be reliable and efficient in use, comparatively inexpensive to manufacture and of such design that a pressure-tight closure is always insured when the valve is closed, after the blow-down operation.

A further object of the invention, is the provision of a blow-down valve of novel construction, whereby the element on which the valve body seats is kept constantly clean, so that a pressure-tight closure is attained, the valve seat being self-cleaned by the valve in moving from open to closed position and the valve body is slidably mounted on the seat and is so shaped that the edge of the valve operates as a scraper to remove any sediment or deposit that may be lodged on the seat as the boiler blows down.

Still another object of the invention is the provision of a valve in which the valve body or closing element is in the form of a slide which rests on its seat and is normally maintained thereon by the boiler pressure and in addition to the valve body, means are provided for clamping the valve against its seat, so that in case of a battery of boilers with the blow-down valves connected with a common drain header, the pressure of the escaping water, when one blow-down valve is open, will not act on the other blow-down valves of boilers of lower pressure and open the same.

With these objects in view and others, as will appear as the description proceeds, the invention comprises various novel features of construction and arrangement of parts, which will be more fully described hereinafter and set forth with particularity in the appended claims.

In the accompanying drawing, which illustrates one embodiment of the invention, and wherein similar characters of reference indicate corresponding parts in all the views, Figure 1 is a side view of a blow-down valve; Fig. 2 is a longitudinal section thereof; Fig. 3 is a transverse section; and Fig. 4 is a perspective view of the valve body with the closing element removed.

Referring to the drawing, A designates a casing of any suitable construction, which is open at its bottom and provided with a removable bottom plate B, which has an outlet opening 1, to which a discharge pipe 2 is connected. In the wall 3 of the casing, is an opening 4, which has a suitable pipe connection 5 with the crown sheet of the boiler. The inner surface 6 of the bottom plate forms a seat for the valve body or closing element 7, which valve body and seat element are made of suitable valve metal or composition, and the bottom surface of the valve body is preferably flat, as is the surface 6 of the bottom plate B and the engaging surfaces of these two parts are carefully machined, so as to provide a tight closure.

The valve body 7 is slidable on the surface 6 for the purpose of covering and uncovering the opening 1, in the bottom plate of the casing. The movement of the valve body is effected in any suitable manner, as for instance by a stem 8 which passes through the bonnet 9 in which the stem is threaded, there being on the outer end of the stem, an operating wheel or equivalent means 10, and a stuffing box 11 is provided on the bonnet where the stem leaves the same. The inner end of the stem has a disk-like head 12, and this head is adapted to engage in a transverse slot 13 formed in the top of the valve body 7, and intersecting this slot, is a cross slot 14, which receives the inner end of the stem. This connection permits the stem to rotate, whereby its thread will cause longitudinal movement, for the purpose of moving the valve body 7 to and from closed position. The end of the valve body 7 nearest the inlet opening 4 of the casing A is inclined or sloping at 15, so that a compara-

tively sharp, chisel edge 16 is provided at the bottom to act as a scraper, as the valve closes for scraping off any matter that accumulates on the valve seat or surface 6, during the blow-down operation. By reason of this feature and by reason of the manner in which the valve is movably mounted, it is possible always to maintain a perfectly tight closure when the valve is closed, as there will be no sediment or foreign matter on the seat element, which will prevent the tight seating of the closing elements, and furthermore the valve is of such design that renewals or repair are reduced to a minimum. The sloping surface 15 of the valve element 7 is disposed opposite the inlet 4, so that the water in entering the casing will strike this surface directly and be deflected thereby to the outlet opening. As the sediment in the water impinges on the surface 15, this surface will receive the wear instead of the seating surface on which the valve bears.

In the case of a battery of boilers, and where the blow-down valves have their outlets connected to a common header, it might sometimes happen that the blow-down valves connected with boilers of lower pressure may be open or unseated when a blow-down valve of a boiler of high pressure is open. For this purpose, means are provided for clamping the valve body or closing element tightly against its seat. Thus a clamping screw 17 is mounted in the top of the casing A in such a manner that the lower end of the screw bears on the top of the closing element 7, so as to force the same tightly against its seat. This screw passes out through a bonnet 18 and is provided with a handle or equivalent means 19, so as to conveniently operate the same. The clamping screw will of course be loosened preparatory to the moving of the valve body or closing element 7, to open position when the boiler is to be blown down.

From the foregoing description taken in connection with the accompanying drawing, the advantages of the construction and method of operation will be readily understood by those skilled in the art to which the invention appertains and while I have described the principle of operation, which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is simply illustrative and that such changes may be made when desired as are within the scope of the appended claims.

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

1. A blow-down valve, comprising a casing, a plate forming the bottom of the casing and constituting a valve seat element, a sliding valve element arranged within the casing and resting on the seat element, a port in the seat element, an inlet connection for the casing, and means for operating the valve element, said valve element having one end sloping, whereby the seat-engaging surface and sloping surface of the valve element form a sharp edge at its front for scraping off the seat element during the closing movement of the valve element, the inlet being adjacent the sloping surface of the valve element, whereby the entering water impinges on such sloping surface.

2. A blow-down valve, comprising a casing, an inlet connection therefor, a plate having an outlet port and constituting a seat, a valve body slidable on said plate to open and close the port thereof, means for actuating the valve element, a loose connection between the said means and the valve element, and means for forcing the valve element against the said seat.

3. A blow-down valve, comprising a casing, an inlet connection therefor, a flat plate having an outlet port and constituting a seat, a valve body slidable on said plate to open and close the port thereof, means loosely connected with and actuating the valve element, and a device mounted in the casing and arranged to engage the valve element to clamp the same against its seat when the valve element is in closed position and movable out of engagement with the valve element to permit the latter to move to open position.

4. A blow-down valve, comprising a casing, a bottom plate therefor, having a flat inner surface and provided with an outlet port, a valve element resting on the said bottom plate and slidable on the inner surface thereof to open and close the said port, an operating device mounted in the casing, and connecting means between the operating device and valve element, said connecting means permitting the valve element to be detached with the removal of the bottom plate, while the operating means remains *in situ*.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS F. CLARK.

Witnesses:
E. P. Cole,
W. J. Daubney.