

J. F. MATTERN AND G. M. STONER.

BLOW-OFF VALVE.

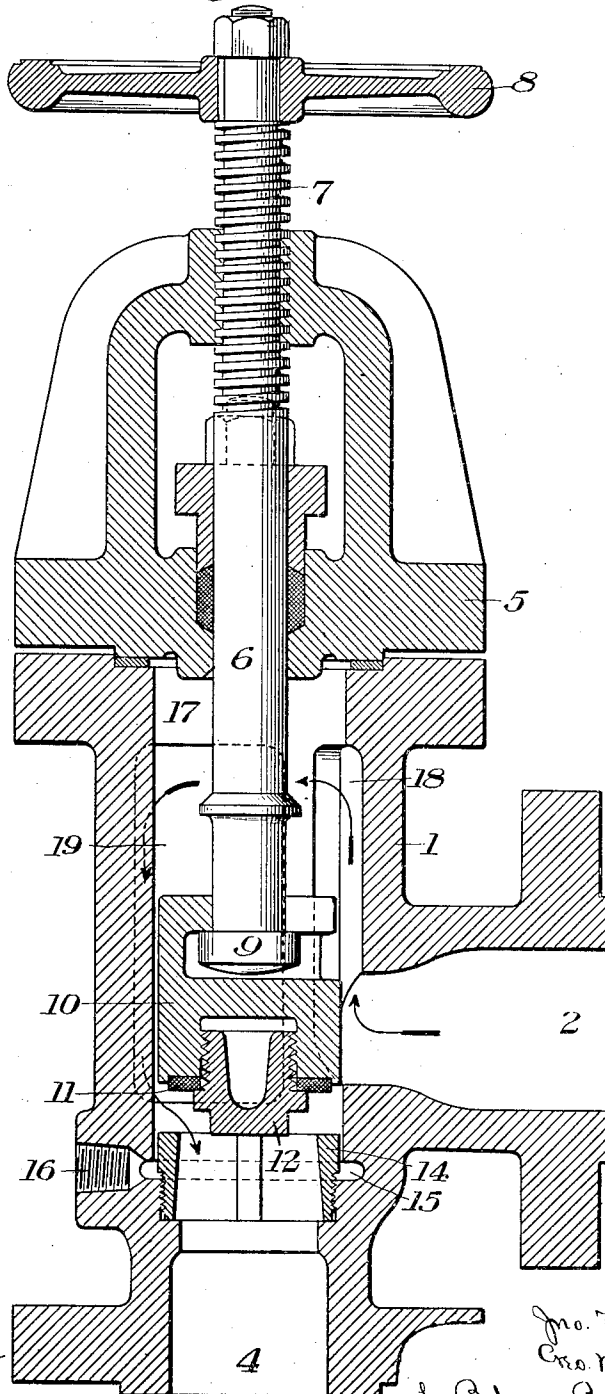
APPLICATION FILED JULY 2, 1919.

1,358,968.

Patented Nov. 16, 1920.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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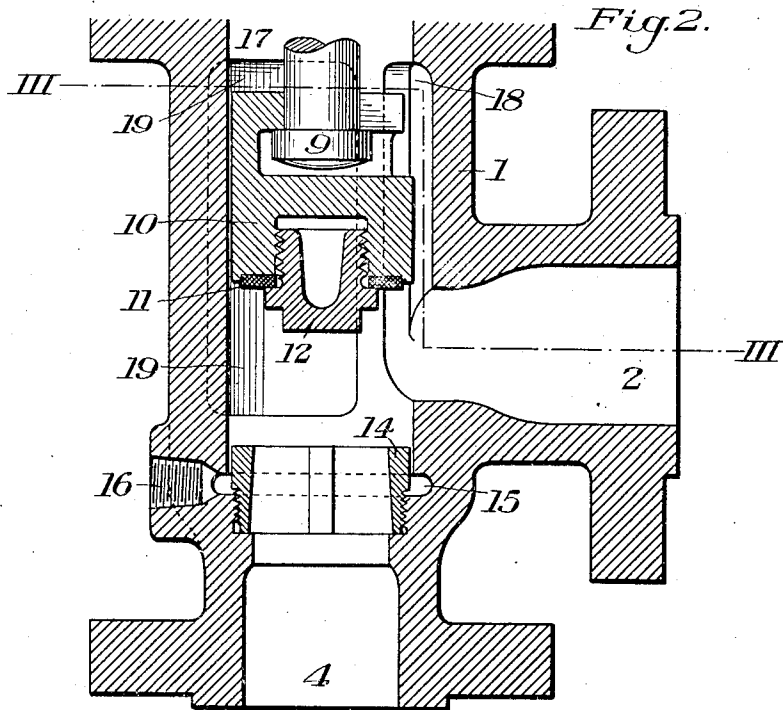
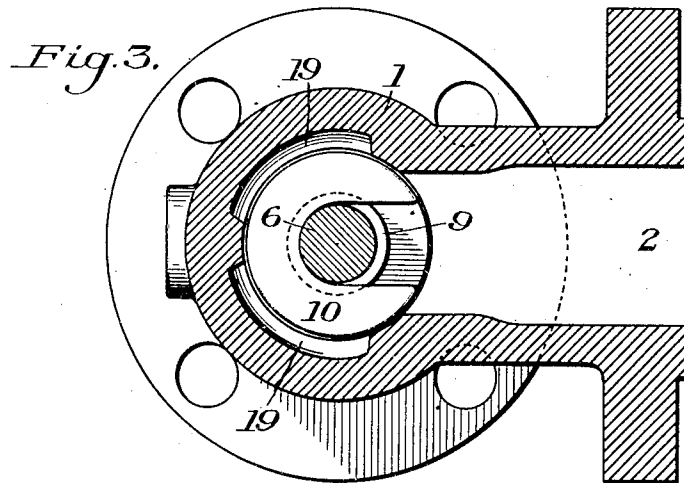
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INVENTORS

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UNITED STATES PATENT OFFICE.

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BLOW-OFF VALVE.

1,358,968.

Specification of Letters Patent. Patented Nov. 16, 1920.

Application filed July 2, 1919. Serial No. 308,199.

To all whom it may concern:

Be it known that we, JOHN F. MATTERN and GEORGE M. STONER, both citizens of the United States, and residing, respectively, at Wilkinsburg and Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Blow-Off Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

The present invention relates broadly to valves, and more particularly to blow-off valves adapted for use in connection with steam boilers and the like.

The principal object of the present invention is to provide a valve with means for cleaning the same each time the valve is operated.

A further object of the invention is to so construct a valve of this nature that the accumulation or deposit of sediment and the like above the valve is removed during each operation of the valve.

A further object of this invention is to construct a blow-off valve having by-passes or relief passages so formed therein that upon the initial opening movement of the valve the pressure within the boiler to which the same is connected is made available to clean the portion of the casing above the valve, and continued opening movement of the valve establishes a direct connection between the inlet and outlet passages of the valve.

A still further object of the invention is to provide a valve having a jet opening and a passage intersecting at an angle to facilitate and insure complete cleaning of the valve during each operation.

These and other objects, together with their attendant advantages, will be apparent as the invention becomes better understood by reference to the accompanying specification and drawings forming a part thereof, it being premised that changes may be made in the construction of the valve within the scope of the appended claims without departing from the spirit of the invention.

Figure 1 is a vertical section through a valve constructed in accordance with the present invention.

Fig. 2 is a section corresponding to Fig. 1 showing the valve completely opened; and

Fig. 3 is a cross sectional view on the line III—III of Fig. 2.

Referring more particularly to the drawings, we have illustrated a valve casing 1 having an inlet passage 2 and an outlet passage 4 formed therein. Surmounting the casing is a head member 5 of any desired construction, tightly maintained on the casing by any suitable means.

Passing through the head member 5 is a valve operating stem 6 having a threaded portion 7 for engagement with a corresponding threaded portion in the head. A suitable hand wheel 8, or the like, may be provided for operating the same.

Mounted on the lower enlarged end 9 of the valve stem is a piston valve 10 having a seating face provided with a suitable packing material 11. Any desired means, such as the plug 12 may be utilized for holding the packing in position.

Detachably secured in the valve casing to cooperate with the packing 11 on the valve, is an annular seating member 14. In the preferred construction there is provided an annular passage 15 surrounding the seating member, which passage communicates with a jet opening 16 through which steam under pressure may be admitted for cleaning the valve or removing sediment from the seat during the initial opening movement of the valve.

It has been found in actual use that in valves of this type there forms an accumulation or deposit of foreign matter in the chamber 17 above the valve. Unless the valve is taken down and the sediment removed periodically, the operation of the valve is impeded. For removing this accumulation automatically each time the valve is operated, we have provided the chamber with by-passes 18 leading from the inlet passage 2 into the upper portion of the chamber 17, by which steam under pressure is admitted at all times to the chamber. As soon as the valve is unseated, the exhaust by-passes 19 are uncovered at their lower ends permitting the fluid, together with the foreign matter, to pass downwardly through the outlet passage as indicated by the arrows

in Fig. 1. During this time direct communication between the inlet passage and the outlet passage is prevented by the piston valve 10. Continued opening movement of the valve to the position shown in Fig. 2 establishes communication between the inlet and outlet passages in the valve casing, permitting the flow of water therethrough.

While we have found that the by-passes or relief passages 18 and exhaust passages 19 will effectively clean the chamber 17 when employed alone, their operation is materially assisted by combining the same with the steam jet opening 16. Due to the intersection at an angle of the steam jet opening 16 and the exhaust passages 19, the deposit of any material from the valve chamber upon the valve seat is prevented. This material is held out of contact with the walls and seat of the valve so that scoring and cutting of the same is prevented, by the combined action of the intersecting jets.

It will be apparent that the specific construction of the valve casing and of the valve itself, may be changed and constructed in any desired manner to adapt the same for the specific use to which it is to be placed, without affecting the operation of the same or departing from the present invention.

We claim:

1. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, and a valve cooperating with said seat, said casing being provided with means controlled by said valve for cleaning by the action of the fluid from the inlet the portion of the casing above the valve during the opening movement thereof before direct communication between the inlet and outlet passages is established, substantially as described.

2. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, and a valve cooperating with said seat, said casing being provided with means controlled by said valve for simultaneously cleaning by the action of the fluid from the inlet the valve seat and the portion of the casing above the valve during the opening movement thereof before direct communication between the inlet and outlet passages is established, substantially as described.

3. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, and a valve cooperating with said seat, said casing being provided with means intersecting at an angle and controlled by said valve for cleaning by the action of the passing fluid the valve during the opening movement thereof, substantially as described.

4. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, and a valve cooperating with said seat, said casing having by-passes formed

therein and controlled by said valve for cleaning by the action of the passing fluid the portion of the casing above the valve during the opening movement thereof, substantially as described.

5. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, a valve chamber above said seat, a valve in said chamber cooperating with said seat, and means for operating said valve, said chamber being provided with passages controlled by said valve for cleaning by the action of the passing fluid the chamber above the valve during the initial opening movement thereof, substantially as described.

6. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, a valve chamber above said seat, a valve in said chamber, and means for reciprocating the valve in said chamber, said chamber being provided with passages controlled by the valve during the initial opening movement thereof before the inlet passage is uncovered, for cleaning by the action of the passing fluid the valve chamber during the initial opening movement of the valve, substantially as described.

7. A valve casing having inlet and outlet passages formed therein, a valve seat intermediate said passages, a piston valve cooperating with said seat, and means for operating said valve, said casing being provided with passages communicating with the inlet passage at one end and closed at their exhaust end by the valve when the same is seated for directing a cleaning jet above the valve during the initial opening movement thereof, substantially as described.

8. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, and a valve cooperating with said seat, said casing having passages for a plurality of independent intersecting cleaning jets, said passages being controlled by said valve for cleaning by the action of the passing fluid the valve during the opening movement thereof, substantially as described.

9. A valve casing having inlet and outlet passages, a valve seat intermediate said passages, and a valve cooperating with said seat, said casing having a cleaning passage communicating at one end with said inlet passage and terminating at its opposite end adjacent said seat, said casing having a supplemental jet opening adjacent the terminating end of said cleaning passage, said passage and said jet opening being rendered inoperative by said valve when in closed position, substantially as described.

10. A valve casing having inlet and outlet passages, a valve seat intermediate said passages and below the level of the inlet pas-

sage, a valve coöperating with said seat, said casing having a bypass therein communicating at one end with the inlet passage and terminating at its opposite end adjacent
5 said seat for cleaning the portion of the casing above the valve during the initial opening movement thereof before direct communication between the inlet and outlet passages is established, substantially as de-
10 scribed.

11. A valve casing, having inlet and outlet passages, a valve seat intermediate said

passages, a valve coöperating therewith, and means for bypassing fluid around said valve from the inlet to the outlet during the
15 initial opening movement thereof before direct communication is established between the inlet and outlet, substantially as described.

In testimony whereof, we have hereunto 20 set our hands.

JOHN F. MATTERN.
GEORGE M. STONER.