

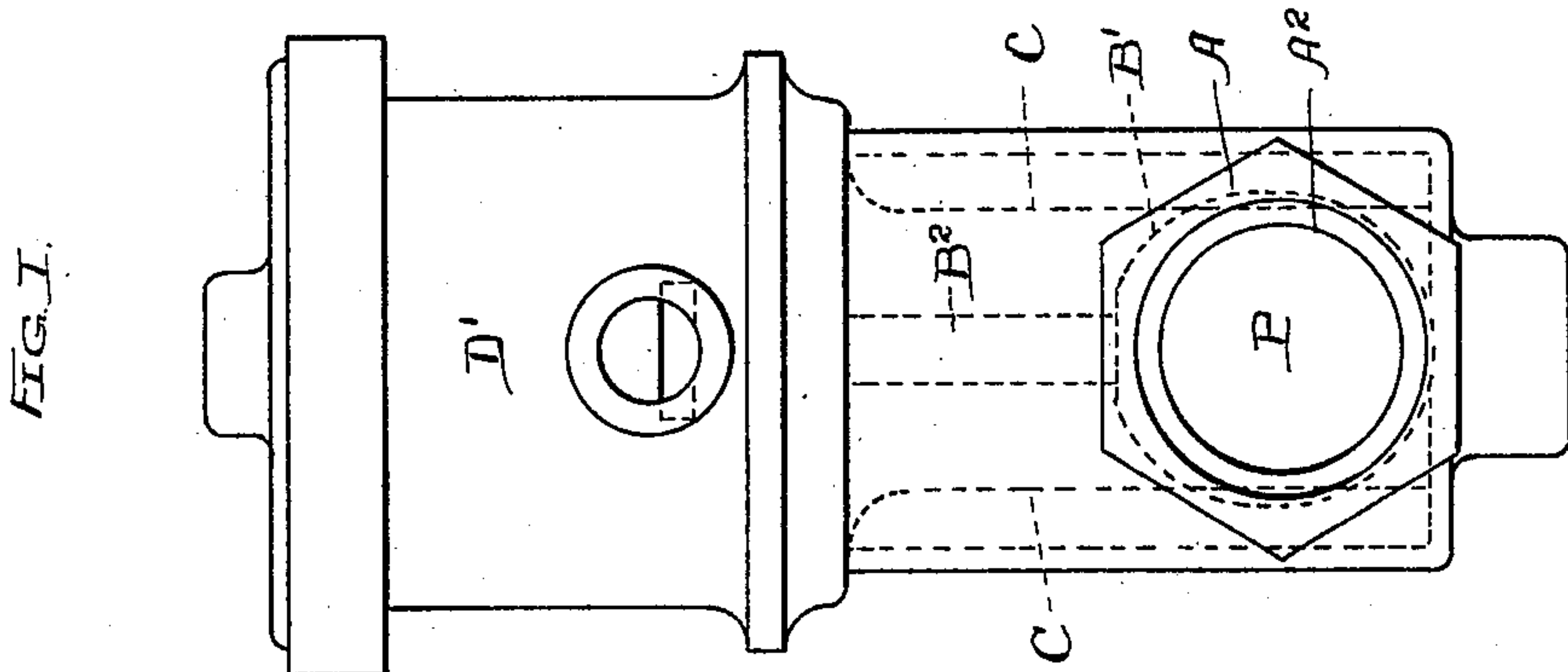
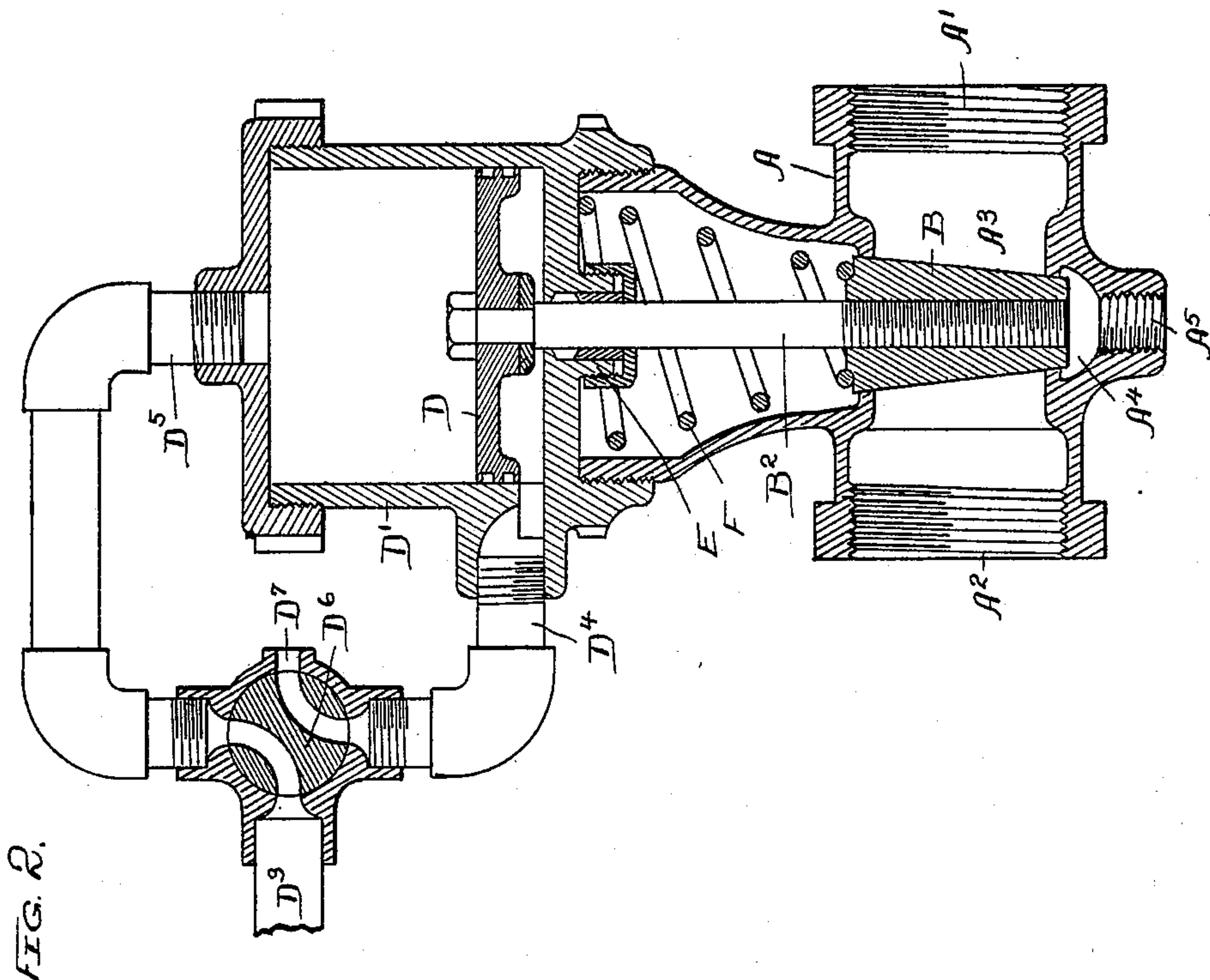
No. 607,265.

Patented July 12, 1898.

D. McLEAN.  
BLOW-OFF VALVE.

(Application filed Jan. 5, 1898.)

(No Model.)



WITNESSES:

*Sew. E. Lewis*  
*A. W. Munday*

INVENTOR:  
DAVID McLEARN

BY *Munday, Everts & Holcomb*

HIS ATTORNEYS.



# UNITED STATES PATENT OFFICE.

DAVID MCLEAN, OF CHICAGO, ILLINOIS.

## BLOW-OFF VALVE.

SPECIFICATION forming part of Letters Patent No. 607,265, dated July 12, 1898.

Application filed January 5, 1898. Serial No. 665,649. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID MCLEAN, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Blow-Off Valves for Locomotives, of which the following is a specification.

In this invention I have endeavored to make the valve movements entirely independent of any direct action of the steam from the boiler and also to make the valve and its seat of a form capable of opening widely, so as to form a large and unrestricted opening; also, to make the valve and its seat of such form as will obviate the lodgment of scale or sediment between them and the consequent inability to absolutely shut off the discharge. The construction by which these objects are attained will be fully understood from the description given below and from the accompanying drawings, in which—

Figure 1 is an elevation of my invention; and Fig. 2 is a central section thereof, the latter view showing also the air-valve for controlling the blow-off valve.

In said drawings, A represents the valve box or casing, having openings A' A<sup>2</sup> at opposite ends of the valve-passage A<sup>3</sup>, one opening connecting with the boiler and the other with the discharge.

The blow-off valve is shown at B and is preferably of the gate variety, having a movement at right angles to the passage A<sup>3</sup>. Its outline is indicated by the broken line B' in Fig. 1, and upon its flat sides it is preferably made tapering, as shown at Fig. 2. Of course the walls of the passage are recessed to correspond with the valve, and below its seat is a cross-opening A<sup>4</sup>, connecting with the opening A<sup>5</sup>, through which the valve-seat and passage may be cleaned. It will be noticed that when this valve moves into its closed position it is apt to push any scale lodging along the walls of its seat ahead of it either into the main passage or into the cross-opening A<sup>4</sup>.

The movements of the valve B are not caused in any way by the steam-pressure acting directly upon the valve, but instead thereof it is preferably moved in both directions between guides C C, which extend upward from passage A<sup>3</sup> into the upper part of the valve-box, as seen at Fig. 1, by air-pres-

sure acting upon the piston D in cylinder D', such piston being joined to valve B by the stem B<sup>2</sup>. The air for operating this motor-piston is supplied through the pipe D<sup>3</sup> and the branches D<sup>4</sup> and D<sup>5</sup>, one branch leading to the top and the other leading to the bottom of the cylinder, as plainly indicated. The valve D<sup>6</sup>, which is under the control of the engineer and preferably by means of levers which he can operate from his cab, controls the air from pipe D<sup>3</sup> and directs it, as desired, to either side of the piston. As shown, the air-pressure is acting upon the top of the piston and the blow-off valve is closed, and at the same time the exhaust-port D<sup>7</sup> of the valve is in communication with the under side of the piston. If a quarter-turn be now given to the valve, the compressed air will be directed under the piston, thereby opening valve B, and at the same time the air above the piston will be given exit through the valve D<sup>6</sup> and port D<sup>7</sup>.

A stuffing-box E is placed around the stem B<sup>2</sup>, as shown, and a coil-spring F, encircling said stem, is arranged between the top of box A and the top of valve B, its tension being exerted down upon the valve in order that the latter may not open until the air-pressure under piston D becomes sufficient to overcome the spring.

It will be also noticed that when the valve B is open a straight and unrestricted channel of large capacity is afforded for the passage of the water, mud, scale, &c., from the boiler, through which solids may be blown.

By turning the air-valve so as to open the branch D<sup>4</sup> or D<sup>5</sup> only part way and then closing it before the piston has moved its entire stroke the blow-off valve may be moved to and held in a partially-open position. This is frequently desirable.

It will be noticed that the movement of the valve B is at right angles to the direction in which the steam-pressure from the boiler is exerted against the valve; also, that the valve is stayed by the guides against the steam-pressure in any partially-open position as well as in its closed position; also, that in closing it moves in a direction substantially parallel to the guides and to the faces of its seat and is thus adapted to force out any pieces of scale lodged against the guides or seat.



While I have shown the form of apparatus which I deem the best, it will be obvious that other forms of valves may be substituted for the valve illustrated without departing from my invention, the chief requisite being that the valve be not moved by the steam acting directly against it. I also do not wish to be limited to the relative arrangement shown of the valve and its actuating means, nor to the construction described of the actuating means, nor to actuating means adapted to move the valve back and forth in a straight line, as obviously the actuating devices must be adapted to impart the motion required by the valve; nor do I wish to be limited in all my claims to a piston adapted to actuate the valve in both directions, as it is obvious that the spring shown might be utilized for moving it in one direction, and in that case one of the air connections of cylinder D' would be unnecessary.

I claim—

1. The combination with the valve closing the blow-off passage, such valve being unaffected by the steam pressing against it, of means for moving said valve, and the spring F, substantially as specified. 25

2. The combination with the valve closing the blow-off passage, such valve being unaffected by the steam pressing against it, of means for both opening and closing said valve, and a spring acting to retain the valve in its closed position, substantially as specified. 30

3. The combination with the valve closing the blow-off passage, such valve being unaffected by the steam pressing against it, of a motor for opening the valve, and a spring tending to close it, substantially as specified. 35

DAVID McLEAN.

Witnesses:

EDWARD S. EVARTS,  
H. M. MUNDAY.