(No Model.)

A. D. DONALDSON.

CONTROLLING VALVE.

No. 600,829. Patented Mar. 15, 1898.

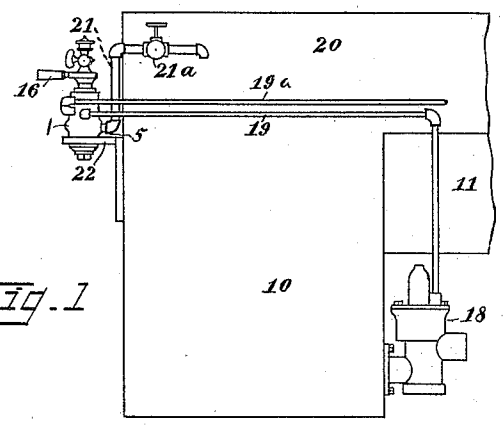


Fig. 1

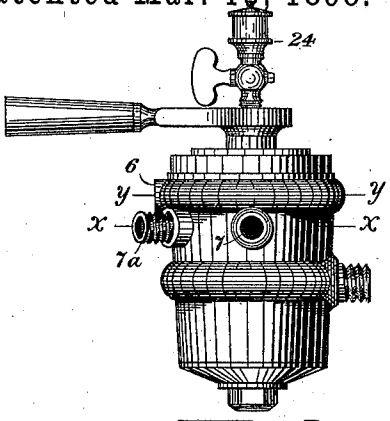


Fig. 2

Fig. 3

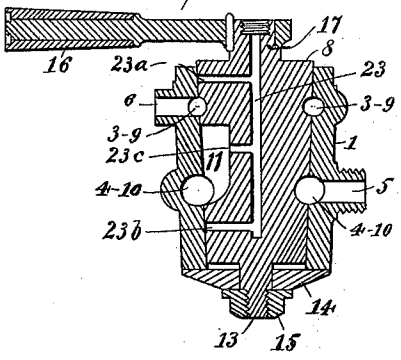


Fig. 4

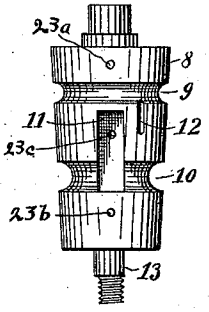
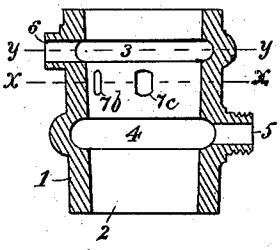


Fig. 5



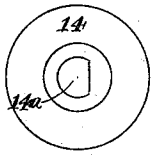


Fig. 8

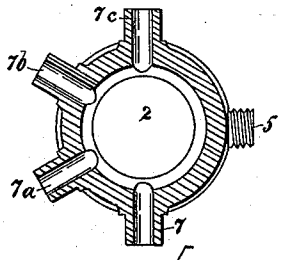


Fig. 6

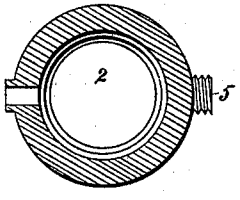


Fig. 7

Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ARTHUR D. DONALDSON, OF PAINESVILLE, OHIO, ASSIGNOR TO J. S. CASEMENT, OF SAME PLACE.

CONTROLLING-VALVE.

SPECIFICATION forming part of Letters Patent No. 600,829, dated March 15, 1898.

Application filed April 29, 1897. Serial No. 634,423. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR D. DONALDSON, a citizen of the United States, residing at Painesville, in the county of Lake, State of Ohio, have invented a certain new and useful Controller-Valve, of which the following, with the accompanying drawings, is a full, clear, and exact description, such as will enable those skilled in the art to make and use said valve.

The object of my invention is a simple and practical valve for controlling the admission of steam to the cylinders of steam-operated boiler-blow-off valves and its adaptation specially to use with the blow-off valves for locomotive-boilers for which Letters Patent No. 540,003, dated May 28, 1895, were issued to George Reed and J. S. Casement. In practice four of such blow-offs are connected to a locomotive-boiler, they being located at such places separated from one another as will facilitate cleaning the boiler throughout its interior.

My invention consists of a cylindrical valve provided with suitably-arranged steam connection, outlet connections, steam-ports and exhaust-ports for controlling the admission of steam to the cylinders of said several blow-off valves and to exhausting steam therefrom, and also in providing means for oiling said valve and the blow-off cylinders.

Reference is here made to the claims for a more specific definition of my invention.

In the drawings, Figure 1 is a reduced outline illustrating the application of my valve in practice. Fig. 2 is a side elevation of my valve, and Fig. 3 is a central vertical section of the same. Fig. 4 is an elevation of the valve-plug. Fig. 5 is an axial section of the valve-case, illustrating its interior. Fig. 6 is a horizontal section of the valve-case on the line x x. Fig. 7 is a horizontal section of the valve-case on the line y y, and Fig. 8 is a plan of the washer that closes the lower end of the valve-case.

In the embodiment of my invention I employ a casing 1, having a tapering cylindrical opening 2 through it longitudinally and the interior annular grooves 3 and 4. A steam-inlet opening 5 communicates with the annular groove 4, and an exhaust-opening 6 connects the annular groove 3 with the atmosphere. Around the casing, between the annular grooves 3 and 4, are four outlet-ports 7, 7^a, 7^b, and 7^c of equal distances apart. A tapering cylindrical plug 8 fits in the cylindrical opening through the valve-case. Around the plug 8 are annular grooves 9 and 10, that coincide with the annular grooves 3 and 4 in the valve-case. The coinciding grooves 4 and 10 form an annular steam-port 4 10 around the valve-plug, and the coinciding grooves 3 and 9 form an annular exhaust-port 3 9 around the valve-plug.

Opening vertically from the groove 10 above it in the plug 8 is a steam-port 11, that is adapted to communicate with the outlet-ports 7, 7^a, 7^b, and 7^c severally as the plug is turned in the valve-case, and at one side of the vertical steam-port 11 in the plug 8 is a vertical exhaust-port 12, that opens into the annular groove 9 and is adapted to communicate with the outlet-ports 7, 7^a, 7^b, and 7^c severally as the plug is turned in the valve-case. The distance from center to center of the vertical steam and exhaust ports is the same as the distances between the centers of the steam-outlet ports. On the lower end of the plug 8 and preferably integral therewith is a lug 13, that passes through the washer 14. The outer end of the lug 13 projecting beyond the face of the washer 14 is threaded to allow the nut 15 to be screwed thereon. The hole 14^a through the washer 14 is straight on one side, as illustrated, Fig. 8, and the lug 13 above its threaded part is shaped to fit in said hole 14^a. This construction causes the washer to turn with the plug and so avoids turning the nut loose when the plug is turned. The washer, threaded lug, and nut keep the plug in place in the valve-case. The operating-handle 16 is fixed to the shank 17 of the plug 8 by any known means. The handle is located directly above the vertical steam-port 11 in order that said port may be located without difficulty.

Each of the valve-openings 7, 7^a, 7^b, and 7^c is connected with the cylinder of a blow-off valve 18 by a pipe 19 19^a, &c. As the connections between said several valve-openings and the different blow-off valves are alike, but one blow-off valve is shown in the drawings. That one is illustrated as connected

with the water-space around the fire-box. The valve inlet-port 5 is connected with the boiler 20, near its upper side, by the pipe 21, from whence steam is taken to open the blow-off valves. In the steam-pipe 21 is a plug or a globe-valve 21^a for shutting off steam to the controller-valve when said valve is not in use. The controller-valve may be stationed at any convenient place in the locomotive-cab, and it may be supported by a bracket 22 or otherwise.

The means adopted for oiling the controller-valve and for carrying oil to the cylinders of the blow-off valves consists of the vertical oil-passage 23 and the lateral oil-passages 23^a and 23^b for oiling the controller-valve, and the lateral oil-passage 23^c conducts oil to the vertical steam-port 11, from whence the oil is carried by steam to the cylinders of the blow-off valves through the connecting-pipes 19 19^a, &c. 24 is the oil-cup, connected with the oil-passages 23.

The operation of my valve is as follows: When open, steam passes in at the inlet-port 5 to the annular steam-port 4 10. From thence it passes through the vertical steam-port 11 to the pipes connected with the outlet-port 7 or 7^a or 7^b or 7^c, according to the position of the valve-plug. When the handle is in the position illustrated and when it is in a position directly opposite that illustrated, the valve is closed. When the handle is directly above the outlet 7, steam will pass from the inlet-port to the annular steam-port 4 10, from thence through the vertical steam-port 11 to the outlet 7, and thence through the pipe 19 to the cylinder of the blow-off 18. When the handle is turned to a position directly above the outlet 7^a, steam will pass through the valve steam-ports and said outlet, and the vertical exhaust-port 12 will then be opposite the outlet 7. In this position steam in the pipe connected with the outlet 7 will exhaust through the vertical exhaust-port, the annular exhaust-port 3 9, and the exhaust-opening 6 to the atmosphere. When the handle is above the outlet 7^b, steam will pass through said outlet and steam will be exhausted from the pipe connected with the outlet 7^a. When the handle is above the outlet 7^c, steam will pass through said outlet and steam will be exhausted from the pipe connected with the outlet 7^b. To exhaust steam from the pipe connected with the outlet 7^c, the vertical exhaust-port 12 must be turned opposite said outlet.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A blow-off controlling-valve consisting of a cylindrical plug within a valve-casing, an annular steam-port around the plug, an inlet-opening to the annular steam-port, outlet-openings, a vertical steam-port connected with the annular steam-port and adapted to communicate with the outlet-openings severally, an annular exhaust-port around the plug, a vertical exhaust-port to the annular exhaust-port, an exhaust-opening from the annular exhaust-port, a vertical oil-passage in the plug and radial oil-passages therefrom for oiling the valve, and a handle to operate said valve, all arranged and operating substantially as described.

2. In a blow-off controlling-valve, a cylindrical plug within a valve-case, an annular steam-port around the plug, an inlet-opening to the annular steam-port, outlet-openings in the valve-case, a vertical steam-port opening from the annular steam-port and adapted to communicate with the outlet-openings severally, an annular exhaust-port around the plug, a vertical exhaust-port opening into the annular exhaust-port and adapted to communicate with the outlet-openings severally, an exhaust-opening from the annular exhaust-port, and means to operate the valve, substantially as described.

3. In a blow-off controlling-valve, a cylindrical plug within a valve-case, an annular steam-port around the plug, an inlet-opening to the annular steam-port, outlet-openings in the valve-case, a vertical steam-port opening from the annular steam-port and adapted to communicate with the outlet-openings severally, an annular exhaust-port, a vertical exhaust-port opening to the annular exhaust-port and adapted to communicate with the outlet-openings severally, an exhaust-opening from the annular exhaust-port to the atmosphere, and an operating-handle attached to the plug and projecting radially directly above the vertical steam-port, substantially as described.

4. In a blow-off controlling-valve, means consisting of a vertical oil-passage with radial oil-passages leading therefrom, one of said radial oil-passages opening into a steam-port through which steam passes on its way to the cylinder of the blow-off valve, for oiling the controlling-valve and the cylinder of the blow-off valve, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 27th day of March, 1897.

ARTHUR D. DONALDSON.

Witnesses:
T. R. HOFFMAN,
H. A. POST.