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B. J. JONES.
CYLINDER DRAINAGE AND RELIEF VALVE.
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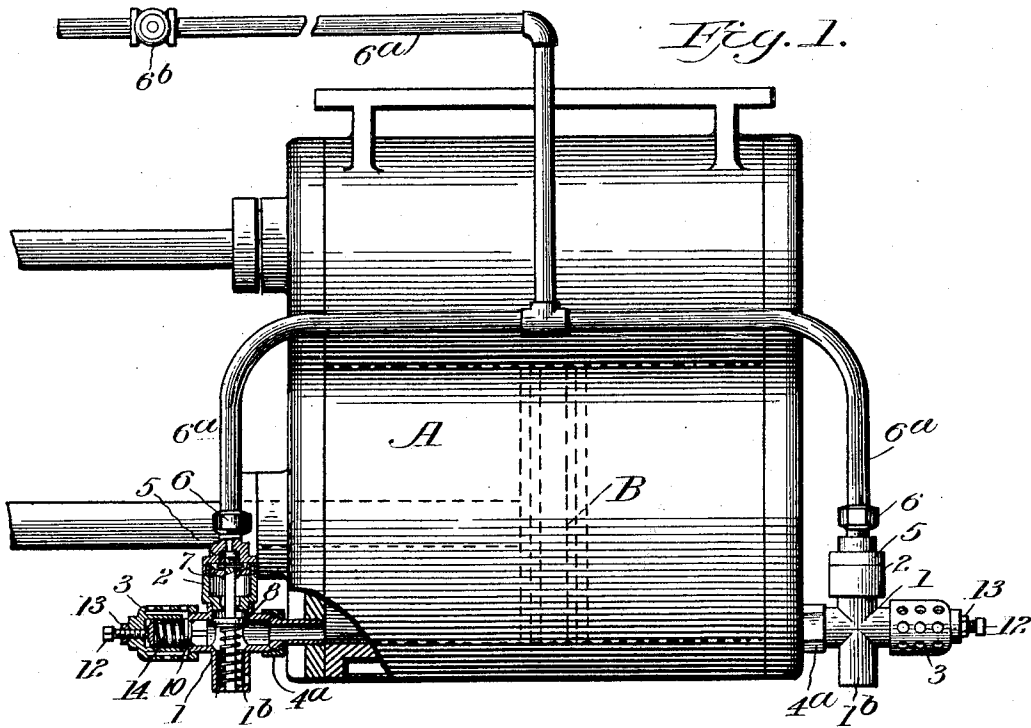
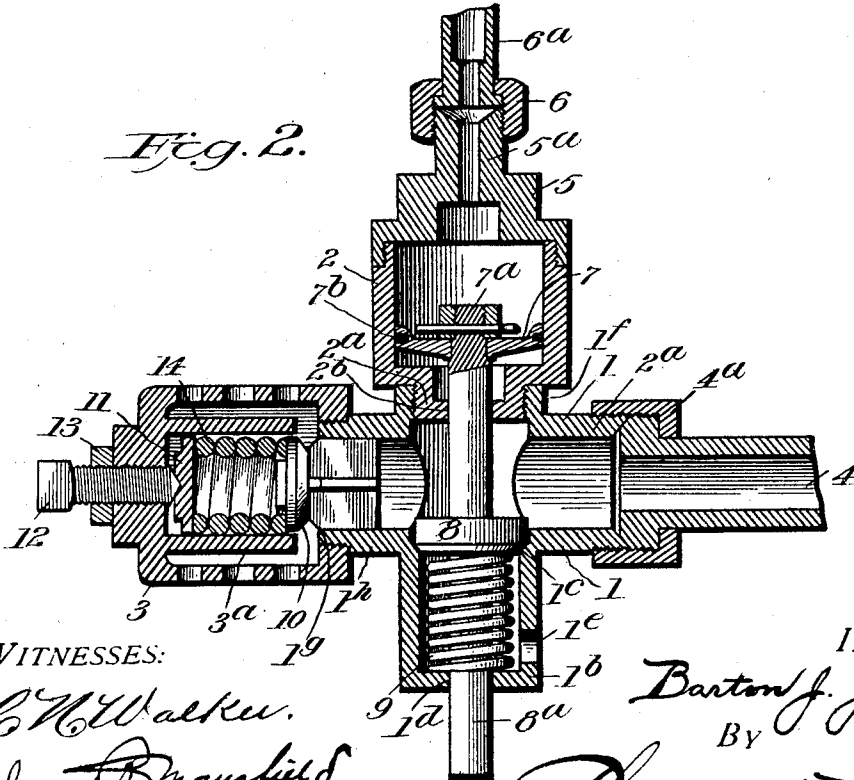


Fig. 2.



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CYLINDER DRAINAGE AND RELIEF VALVE.

SPECIFICATION forming part of Letters Patent No. 795,134, dated July 18, 1905.

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To all whom it may concern:

Be it known that I, BARTON J. JONES, of Cheyenne, in the county of Laramie and State of Wyoming, have invented certain new and useful Improvements in Cylinder Drainage and Relief Valves; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

This invention is an improvement in cylinder drainage and relief valves; and its object is to dispense with the usual valve-rigging—such as slide-bars, levers, cams, &c.—ordinarily employed on locomotive-cylinders to control the drainage-cocks and relief-valves thereof and to provide a simple, efficient, and reliable valve which is controllable by air or steam pressure which can be regulated by a three-way valve in the engine-cab.

My valve contains a waste or drainage outlet and a relief-outlet, both closable by proper valves, the waste or drainage valve being normally opened by a spring, but closable by air or steam pressure, while the relief or water valve is normally closed by a spring and comes into active operation only when the drainage-valve is held closed and excessive pressures are produced in the cylinder. The drainage-valve will keep the steam-cylinder free from water of condensation and also serves as a cylinder-cock, and the apparatus will lessen the expense of the maintenance of the cylinders in good condition.

I will now describe the invention in detail in connection with the accompanying drawings, which illustrate the same clearly, and refer to the claims following the description for summaries of the features for which protection is desired.

In said drawings, Figure 1 is a side elevation of an engine-cylinder, showing my valves attached thereto, one valve being in section and showing the drainage-port open. Fig. 2 is an enlarged section through one of the valves, showing the drainage-valve closed.

The device is primarily intended for the cylinders of locomotives, but is, of course, applicable to other engines.

In the drawings, A designates one of the engine-cylinders, in which operates a reciprocating piston B in the usual manner.

One of my improved valves is attached to each end of the cylinder, and as these are duplicates and connected to the cylinder-heads in the same manner an explanation of one will fully explain both.

The valve comprises a casing 1, having an exteriorly-threaded nipple 1^a, which is connected by a union 4^a with a flanged pipe 4, firmly attached to the cylinder-head and communicating with the interior of the cylinder at one side of the piston, as shown, and at such a point that water of condensation in the cylinder can drain through pipe 4 into casing 1. Casing 1 also has a depending pocket 1^b, having a valve-seat 1^c at its upper end and an aperture 1^d at its lower end for the passage of the stem 8^a of a valve 8, which is adapted to close on seat 1^c, but is normally upheld by a coiled spring 9, interposed between valve 8 and the bottom of pocket 1^b, as shown. In the pocket, near its lower end, is an aperture 1^e, through which water or steam can escape or air enter when valve 8 is open. Above valve 8 is a short cylinder 2, having an exteriorly-threaded neck 2^a on its lower end engaging a corresponding interiorly-threaded collar 1^f on the upper end of casing 1, the bottom of cylinder 2 having an aperture 2^b, through which passes the rod 7^a of a piston 7, which works in cylinder 2, and said rod is attached to valve 8, being in axial alinement therewith. The piston 7 is suitably packed in cylinder 2, as at 7^b. The upper end of cylinder 2 is closed by a cap 5, having a contracted neck 5^a, exteriorly threaded and connected by a nipple 6 with the end of a pipe 6^a, which leads to the engine-cab (not shown) or other suitable point and is connected with the air-reservoir or steam-space by a valve 6^b of any suitable construction, so that the engineer can at will admit steam or air into the cylinder 2, so as to drive piston 7 down and close valve 8, compressing spring 9. When the valve 8 is thus closed, as shown in Fig. 2, communication is closed between the cylinder A and the atmosphere, and the escape of steam or water from the cylinder or entrance of air thereinto is prevented. In case of excessive pressure in the cylinder A, however, the fluid is permitted to escape by the valve 10, which is

seated on a seat 1^g in a threaded extension 1^h of casing 1 opposite extension 1^a. Attached to this extension 1^h is a perforated cap 3, whose inner end is internally threaded and 5 screwed onto exterior threads on part 1^h, as shown. This cap 3 is provided with a cylindrical cup 3^a, projecting inwardly from its outer end in axial alinement with valve 10, and within this cup is a stout helical spring 14, 10 interposed between valve 10 and a follower 11 within the cup, said follower bearing against an adjusting-screw 12, tapped through the end of cap 3 and by which the pressure of the spring on valve 10 can be adjusted to 15 any desired degree, and when adjusted screw 12 is locked by a nut 13 thereon. The cap 3^a keeps the spring in position and protects it from becoming clogged by cinders, &c.

Operation: The described valves are placed, 20 as shown, one at each end of the cylinder A, and their cylinders 7 both connect with the same controlling-pipe 6^a, so that both valves 8 can be closed or released simultaneously. When the engine is idle or just starting under 25 load, pipe 6^a should be vented, so that springs 8^a can raise valves 8, allowing the water of condensation to escape through aperture 1^o. After blowing out the water the engineer admits air into cylinders 2, thereby 30 forcing down pistons 7 and closing valves 8, holding them closed during the working operations of the main piston. If while valves 8 are thus closed water should enter or accumulate in the main cylinder or if for any 35 reason excessive pressure is developed therein, valves 10 will be unseated and relieve the pressure by venting the cylinder, valves 10 closing automatically when the excessive pressure is reduced to the working limit. The 40 amount of pressure required to unseat valve 10 is regulated by the pressure exerted by spring 14 thereon. When the engine is coasting, cylinders 2 can be vented through pipe 6^a, allowing valves 8 to raise, and then air can 45 pass back and forth to and from the main cylinder.

It will be seen from inspection of drawings that all parts of the valve may be reached 50 without having to disconnect it from the cylinder.

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

1. In combination with an engine-cylinder, 55 a valve-casing connected thereto having a pocket, a vent-opening in the pocket, a valve-seat at its inner end above the vent-opening, a valve adapted to fit on said seat, and a spring within the pocket adapted to lift the valve 60 and hold it normally unseated; with a small cylinder above the casing, a piston therein having a rod connected with the valve, and a pipe adapted to admit fluid into said small cylinder to seat the valve, and an engineer's 65 valve in said pipe whereby the admission or

venting of fluid therein can be manually controlled, substantially as described.

2. In a drainage-valve the combination of a casing having a depending pocket, a vent-opening in the lower part of the pocket communicating with the atmosphere, a valve-seat at its 70 upper end, a valve adapted to fit on said seat, and having a stem projecting through the pocket, a spring within the pocket adapted to lift the valve and hold it normally unseated; 75 a small cylinder above the casing, a piston therein having a rod extending into the pocket and connected with the valve, and means for admitting fluid into said small cylinder, above the piston therein to seat the valve, substantially as described. 80

3. In combination with an engine-cylinder, a valve-casing connected therewith at one side having a depending pocket provided with an aperture in its bottom, a vent-opening in its 85 side and a valve-seat at its upper end; a small cylinder connected with said casing opposite the pocket, a piston in said cylinder; a valve in said casing adapted to close on said seat, a valve-stem extending through the pocket, a 90 spring interposed between the valve and the bottom of the pocket, a rod connecting the valve with the piston in the small cylinder, a fluid-pressure pipe connected with said small cylinder a manually-controlled engineer's 95 valve connected with said pipe to admit air therein or vent the same, and a relief-valve connected to said casing at one side of said drainage-valve, substantially as described.

4. In combination with the drainage-valve 100 casing and drainage-valve therein, of a relief-valve in the drainage-valve casing, a perforated cap attached to said casing exterior to and around the relief-valve, and having an internal cylindrical cup, a helical spring in said 105 cup bearing against the relief-valve, and means for adjusting the pressure of said spring, substantially as and for the purpose described.

5. In combination with the drainage-valve casing and drainage-valve therein, means for 110 holding the drainage-valve normally open, and fluid-controlled means for closing said valve; of a relief-valve in the drainage-valve casing at one side of the drainage-valve, a perforated cap attached to said casing around the 115 relief-valve, and having an internal cylindrical cup, a helical spring in said cup bearing against the relief-valve, an adjusting-screw tapped through the said cap, to regulate the pressure of said spring, and a fol- 120 lower-plate interposed between the screw and the relief-valve spring, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two 125 witnesses.

BARTON J. JONES.

Witnesses:

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