

W. O. MOODY.
RELIEF VALVE.
APPLICATION FILED APR. 15, 1912.

1,037,509.

Patented Sept. 3, 1912.

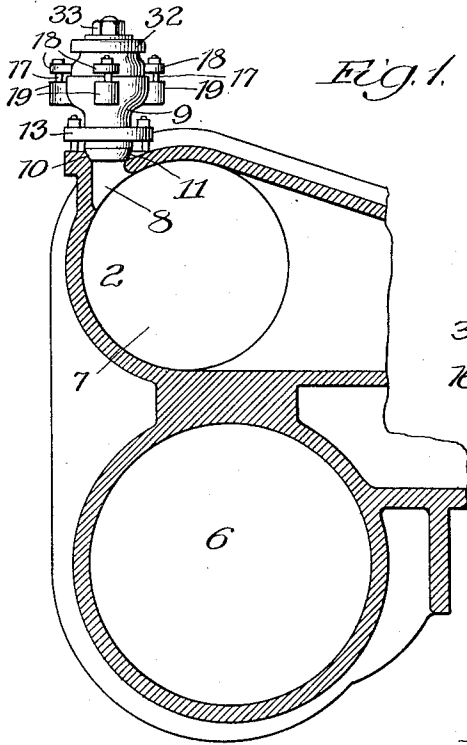


Fig. 1.

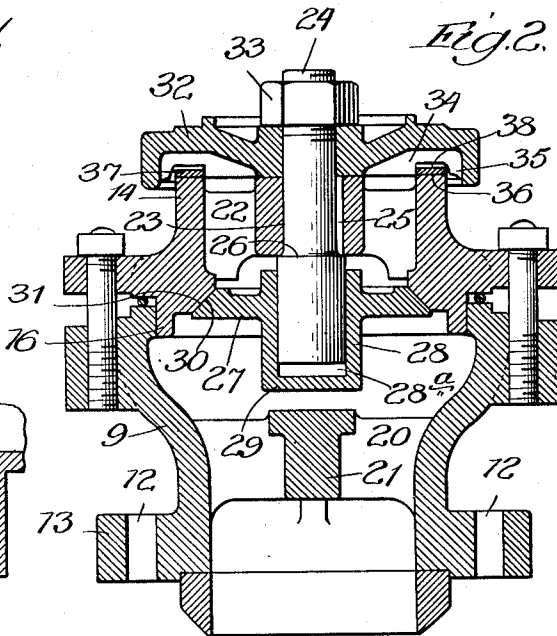


Fig. 2.

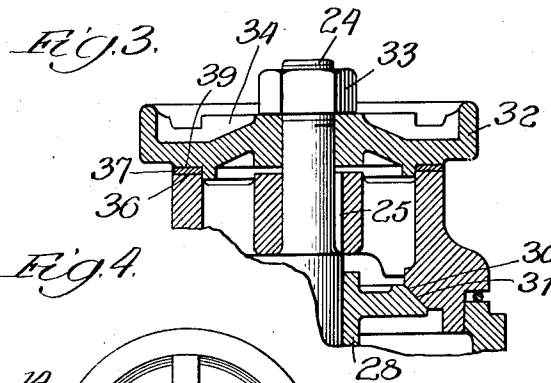


Fig. 3.

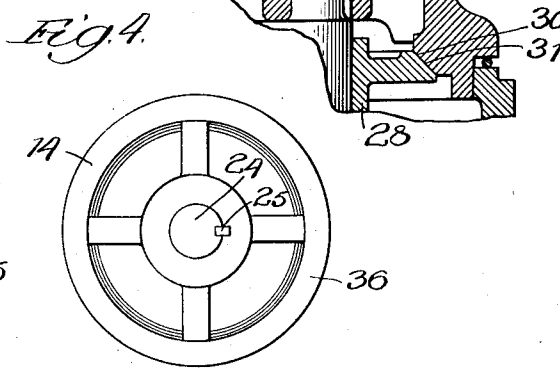


Fig. 4.

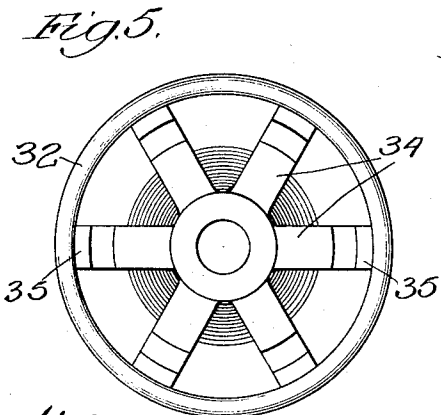


Fig. 5.

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UNITED STATES PATENT OFFICE.

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RELIEF-VALVE.

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To all whom it may concern:

Be it known that I, WILLIAM O. MOODY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Relief-Valves, of which the following is a specification.

My invention relates more particularly to the type of relief-valves used in connection with fluid-pressure engines, my improved relief-valve having been devised for use more particularly, though not exclusively, on locomotives.

My object is to provide a form of cap for a valve of the type above referred to which may be inverted, if desired, for closing the valve outlet in the event of impairment of the valve, and thus prevent substantial escape of steam from the steam-chest; this feature of my invention being of especial advantage in valves for locomotives, as by its provision, the locomotive, should a relief-valve on a steam-chest thereof become impaired, will not be materially disabled but may continue its run.

Referring to the accompanying drawings—Figure 1 is a sectional view of a locomotive cylinder of a type employing piston-valves, the steam-chest of which is equipped with a relief-valve constructed in accordance with my invention, the section being taken transversely through the cylinder and steam-chest, with the valve shown in elevation. Fig. 2 is an enlarged section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow. Fig. 3 is a similar view of the upper end of the valve showing the cap therefor in inverted position in which it serves as a closure for the valve outlet in case of impairment of the valve. Fig. 4 is a plan view of the cap when in the position illustrated in Fig. 3.

In the drawings I have illustrated my improved relief-valve in connection with a locomotive of the piston-valve type, the cylinder of which is represented at 6 and the steam-chest at 7. The steam-chest contains an outlet port 8 which opens into the casing 9 of my improved valve device, the upper end of the wall of the port 8 flaring as represented at 10 to form a seat against which the lower beveled edge 11 of the casing 9 is seated and may be held in close contact to form a tight joint, as by bolts (not shown)

which may pass through openings 12 on a flange 13 on the valve casing 9 and enter a casting containing the steam-chest 7.

The casing 9 in the illustrated embodiment of my invention is formed of two sections 14 and 15, the upper section 14 fitting at a flange 16 on its lower end into the upper open end of the section 15, these sections being secured together by bolts 17 which pass through lugs 18 and 19 thereon. The section 15 is formed internally with a spider frame 20 presenting a central portion 21 which operates as a stop for the valve proper hereinafter described. The upper end of the section 14 contains a spider frame 22 through an opening 23 in the central portion of which a spindle 24 extends and is rigidly secured thereto as by a key 25, the spindle 24 being provided with a shouldered portion 26 at which it fits against the bottom of the spider frame 22.

The valve proper which is represented at 27 loosely surrounds the lower end of the spindle 24 and is reciprocable thereon, the lower end of the hub 28 of the valve 27 being closed as represented at 29 to form a chamber 28^a for a purpose hereinafter explained. The valve 27 coöperates at its beveled annular surface 30 with a similarly beveled annular seat 31 provided on the interior of the casing section 14.

The upper end of the casing 9 is provided with a removable and invertible cap 32 which fits over the upper end of the spindle 24 and against the frame 22 and is secured thereto by a nut 33 screwing upon the upper threaded end of the spindle. The cap 32, which when in normal position (Fig. 2) operates to prevent the access of dirt to the interior of the casing 9, is chambered on its under side as represented at 34 and contains depending ribs 35 thereby rendering the interior of the casing 9 open to the atmosphere. In the construction illustrated I provide a gasket 37 which seats against the surface 36 of the casing section 14 for use when the cap 32 is inverted as hereinafter described, and to prevent displacement of the gasket while the cap is in the position shown in Fig. 2 I provide notches 38 in the under sides of the ribs 35, at which notches these ribs fit over the gasket and the annular surface 36 of the casing section 14.

In the operation of the engine the valve 27 is caused to be reciprocated on the spin-

dle 24, the valve 26, when the pressure in the chest 7 drops below a certain degree, falling away from the seat 31 and striking the frame-stop 21, and when pressure is restored, being driven upwardly thereby to press it against the seat 31. By providing the chamber 28^a in the valve 27 and into which the spindle 24 extends, the upward movement of the valve is retarded by the air cushion thus formed, and it seats gently in closing and thus injurious pounding of the valve against the seat 31 is avoided.

Should any portion of the valve device become impaired sufficiently to render necessary the closing of the interior of the casing 9 to the atmosphere, the cap 32, upon being removed from the position illustrated in Fig. 2 and secured to the casing 9 in inverted position, as illustrated in Fig. 3, will operate to substantially close the outlet end of the casing 9, the flat annular seating surface 39 of the cap together with the gasket 37 and the upper surface 36 of the casing 9 forming a relatively tight joint. It will be understood, however, that, if desired, the gasket 37 may be omitted. While I have illustrated and described a particular embodiment of my invention, I do not wish to be understood as intending to be limited to said embodiment, as the same may be variously modified and altered without departing from the spirit of my invention.

What I claim as new and desire to secure by Letters Patent is:

1. In a valve device of the character set forth, the combination with its casing containing a valve seat and a valve cooperating therewith, of a removable and invertible cap on the casing for the casing outlet, said cap when in one position permitting communication of the interior of the casing with the atmosphere and when in inverted condition serving as a closure for the casing outlet.

2. In a valve device of the character set forth, the combination with its casing containing a valve seat and a valve cooperating therewith, of a removable and invertible cap for the casing outlet secured to said casing and forming a shield for the casing outlet when in one position and when in-

verted thereon serving as a closure for said outlet.

3. In a valve device of the character set forth, the combination with its casing containing a valve seat and a valve cooperating therewith, of a removable and invertible cap for the casing outlet secured to said casing and forming a shield for the casing outlet when in one position and when inverted thereon cooperating with the wall surrounding said outlet to afford a closure therefor.

4. In a valve device of the character set forth, the combination with its casing containing a valve seat and a valve cooperating therewith, of a removable and invertible cap for the casing outlet having grooves on one surface thereof and an annular seating surface on its opposite side, said cap when seated at its grooved surface on said casing affording shielded communication between the interior of said casing and the atmosphere, and when seated in inverted position operating to close said outlet.

5. In a valve device of the character set forth, the combination of a casing containing a valve seat, a spindle supported on the casing, a valve reciprocable on said spindle and cooperating with said seat, and a removable and invertible cap for the casing outlet secured to said spindle, said cap when in one position permitting communication of the interior of the casing with the atmosphere and when in inverted condition serving as a closure for the casing outlet.

6. In a valve device of the character set forth, the combination with its casing containing a valve seat and a valve cooperating therewith, of a removable and invertible cap for the casing outlet formed on one side with a series of spaced ribs containing notches at which the cap is adapted to fit over the outlet end of the casing and provided on its opposite side with an annular seating surface, and a gasket interposed between the casing and said cap for the purpose set forth.

WILLIAM O. MOODY.

In the presence of—

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