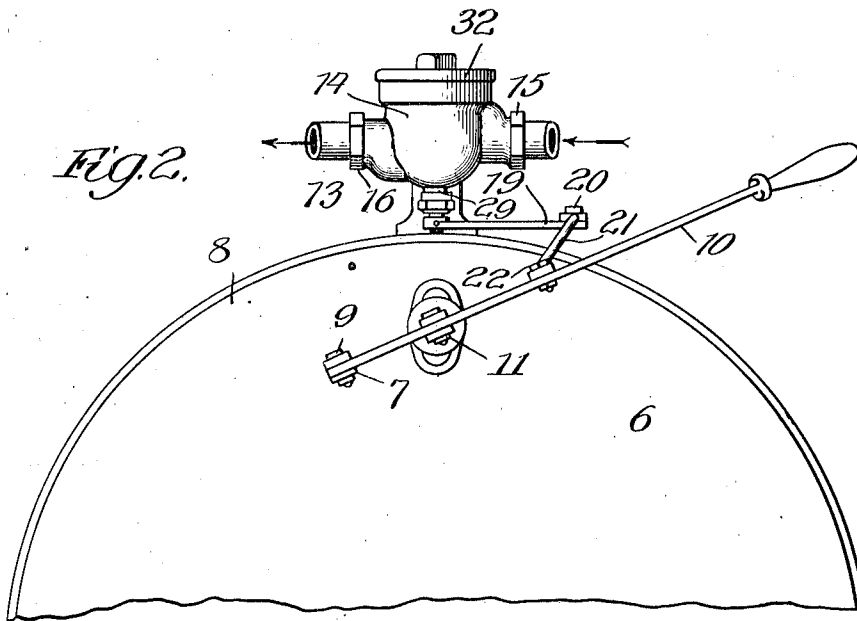
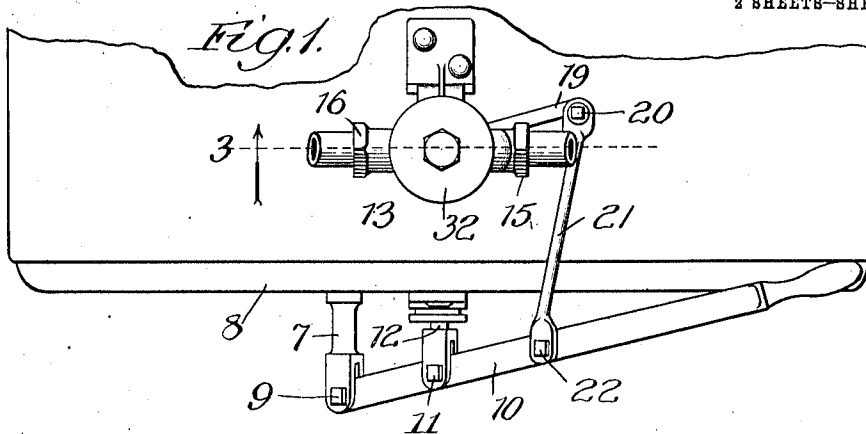


F. LOEDIGE.
VALVE AND VALVE OPERATING MECHANISM.
APPLICATION FILED MAY 21, 1910.

978,463.

Patented Dec. 13, 1910.

2 SHEETS-SHEET 1.



Witnesses:
E. C. Gaylord.
H. F. Chase.

Inventor:
Fred Loedige.
By Seymour, Lee, Christon & Wiles,
Attys.

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2 SHEETS—SHEET 2.

Fig. 3.

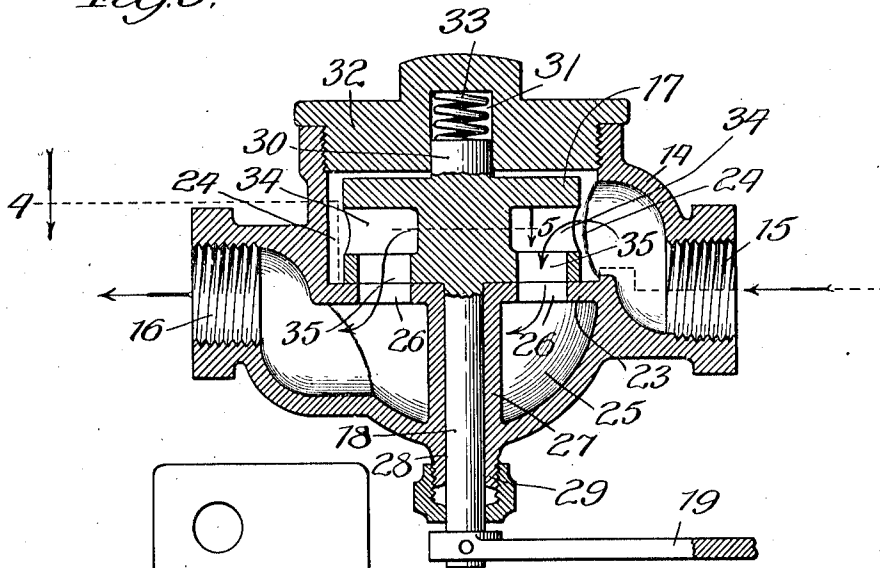


Fig. 4.

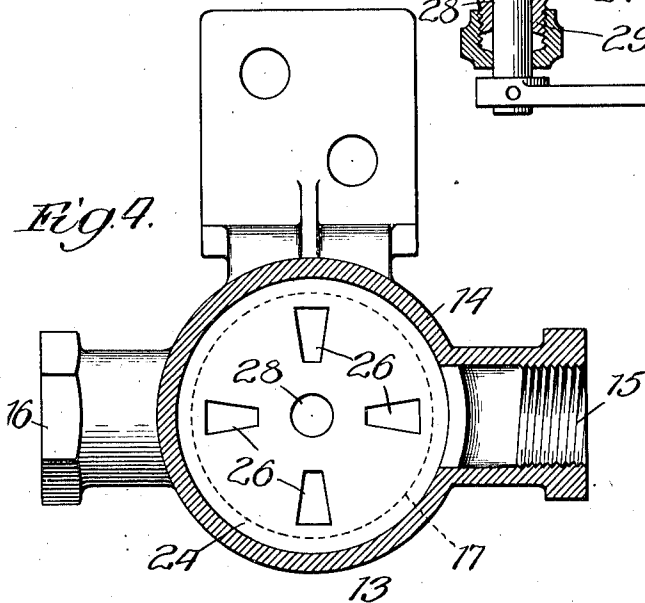
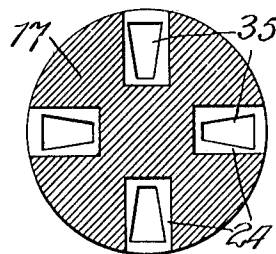


Fig. 5.



Witnesses:
Ed. Chayford,
W. F. Chase.

Inventor:
Fred Loedige,
By Dymally, Lee, Britton & Miles,
Attys.

UNITED STATES PATENT OFFICE.

FRED LOEDIGE, OF CHICAGO, ILLINOIS.

VALVE AND VALVE-OPERATING MECHANISM.

978,463.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed May 21, 1910. Serial No. 562,587.

To all whom it may concern:

Be it known that I, FRED LOEDIGE, 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 Valves and Valve-Operating Mechanism, of which the following is a specification.

My invention relates particularly to valve-mechanism for controlling the passage of steam to the blower usually employed on steam-locomotives at the smoke-arch thereof for producing a forced draft through the stack and mixing the products of combustion therein with steam, when the throttle controlling the passage of steam to the driving-wheel cylinders is closed, for preventing the emitting of smoke from the stack, though the valve-proper may be used for other purposes than that stated.

My primary object is to provide, in connection with the throttle of a locomotive, valve-mechanism connected therewith and operating positively and in a manner to automatically effect introduction of steam into the blower when the throttle is moved to closed position, and to shut off the supply of steam to the blower when the throttle is opened, without affecting the positioning of the throttle when moved to closed position; and another object is to provide an improved construction of rotary valve so balanced as to be readily operated with relatively low power regardless of the pressure of the fluid controlled thereby.

Referring to the accompanying drawings—Figure 1 is a plan view of the rear end of a locomotive boiler equipped with my improvements. Fig. 2 is a view in elevation thereof. Fig. 3 is a section taken at the line 3 on Fig. 1 and viewed in the direction of the arrow. Fig. 4 is a section taken at the line 4 on Fig. 3 and viewed in the direction of the arrow; and Fig. 5, a section taken at the line 5 on Fig. 3 and viewed in the direction of the arrow.

A locomotive boiler is represented at 6 and, as is common in constructions of this kind, is provided with a rearwardly-extending stud 7 secured to its rear end 8 and forming a fulcrum, as indicated at 9, for a throttle-lever 10 pivoted between its ends, at 11, to a forwardly-extending throttle-rod 12 for operating the valves (not shown) for

controlling the passage of steam to the driving-wheel cylinders.

Secured on the top of the boiler is a rotary-valve device 13 formed of a casing 14 provided with an inlet 15 which, in practice, would communicate with the interior of the boiler, and with an outlet 16 leading to the blower (not shown); whereby when the valve is opened, as hereinafter described, steam from the boiler will pass into the blower and thence into the stack. The casing 14 contains a rotary valve 17, the stem 18 of which extends downwardly through the casing 14, as represented in Fig. 2, and carries a horizontally-disposed crank-arm 19 which has pivotal connection, as indicated at 20, with the forward end of a link 21, pivoted as indicated at 22 to the lever 10 at a point intermediate the point of connection of the rod 12 with this lever and its handle-equipped outer end, whereby when the lever is moved in opposite directions the valve 13 will open or close depending on the direction in which it is moved, the parts of the valve hereinafter described being so arranged that when the throttle-lever 10 is moved to closed position (Figs. 1 and 2) the valve 13 will be open and when swung on its fulcrum from closed to open condition, it will operate to move the valve 13 to closed condition through the medium of the crank 19 and link 21.

A description of the particular valve illustrated is as follows: The valve-casing 14 is formed with a horizontal partition 23 forming a valve-seat and dividing the casing into upper and lower chambers 24 and 25, respectively, communicating with the inlet and outlet 15 and 16, the seat 23 containing a circular series of openings 26 therethrough preferably spaced equidistantly and of the number illustrated. Depending from the valve-seat 23, and preferably integral therewith, is a vertically-disposed section 27 formed with a vertical bore 28 circular in cross-section, which opens at its lower end through the bottom of the casing 14 and through an externally-threaded boss 29 provided thereon.

Located in the chamber 24, which is of cylindrical shape in cross-section, is the valve-proper 17, the latter being in the form of a cylindrical disk fitting flatwise against the seat 23 and connected with the depend-

ing stem 18 which latter is journaled in the section 27 and extends through the boss 29. The disk 23 is provided on its upper end with a boss 30 concentric with the stem 18, which is journaled in an opening 31 in a cap-piece 32 screwed into the upper open end of the casing 14 and bears against the inner end of a coiled spring 33 confined in the opening 31, for a purpose hereinafter explained.

The disk 17 which is of slightly less diameter and thickness than the width and height of the chamber 24, respectively, whereby it is spaced at its upper and circumferential surfaces from the cylindrical and top walls of the chamber 24, contains a plurality of radially-extending openings 34 with which openings 35 extending through the under-side of the disk 17 communicate, as represented in Fig. 3, these openings 34 and 35 being of a number corresponding with the number of openings in the seat 23 and arranged in a circular series equidistant from each other and adapted to be moved into registration with the openings 26 in the seat 23 by turning the stem 18.

It will be manifest from the foregoing that the steam entering the casing 14 through the inlet 15 fills the openings 34 and the space between the top and side of the disk 17 and the adjacent surfaces of the chamber 34, with the effect of substantially balancing the valve on its seat 23. When the stem 18 is turned to the position represented in Fig. 3, the openings 35 and 26 in the disk 17 and seat 23, respectively, are caused to register and the steam is then free to pass from the inlet 15 out through the outlet 16, and thence to the blower, as described.

The spring 33 serves to prevent unseating of the disk 17 and consequently access of dirt or grit between the seat 23 and disk 17, when pressure through the casing 14 is reversed, as where the piping connecting this valve to the blower is connected up with a house-blower, as is usually done when the locomotive is first fired.

It will be noted from the foregoing that the valve may be readily operated, and that by reason of its construction may be used for controlling fluid under high pressure without danger of binding the valve. Furthermore, the valve is caused, in the construction described, to be operated automatically by the action of the throttle-lever, without effecting the positioning of the latter when closed.

The feature of providing the stem-journal 27 in connection with the valve-seat 23 is desirable, as the valve is rendered steam tight, even when used under high pressure.

While I have illustrated my improved valve in connection with a throttle-lever for controlling the flow of steam to the blower, I do not wish to be understood as intending to limit it to use in this combination, as it

may be utilized in other situations where an easily operated valve of this type is desirable.

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

1. A valve formed of a casing containing an inlet and outlet, a seat in said casing containing an opening, and a stem-equipped rotary disk cooperating with said seat and containing an opening adapted to be moved into registration with the opening in said seat and opening through said disk in a radial direction, said disk-opening communicating with said inlet when the valve is in both open and closed position.

2. A valve formed of a casing containing an inlet and outlet, a seat in said casing containing an opening, and a stem-equipped rotary disk cooperating with said seat and having its longitudinally-extending sides spaced from said casing-wall and containing an opening adapted to be moved into registration with the opening in said seat and opening through the disk in a radial direction, said disk-opening communicating with said inlet when the valve is in both open and closed position.

3. A valve formed of a casing containing an inlet and outlet, a seat in said casing containing openings, and a stem-equipped rotary disk cooperating with said seat and containing openings adapted to be moved into registration with the openings in said seat and opening through said disk in a radial direction, said disk-openings communicating with said inlet when the valve is in both open and closed position.

4. A valve formed of a casing containing an inlet and outlet, a seat in said casing containing openings, and a stem-equipped rotary disk cooperating with said seat and having its longitudinally-extending sides spaced from said casing-wall and containing openings adapted to be moved into registration with the openings in said seat and opening through the disk in a radial direction, said disk-openings communicating with said inlet when the valve is in both open and closed position.

5. A valve formed of a casing containing an inlet and outlet, a seat in said casing containing openings, and a stem-equipped rotary disk cooperating with said seat and having its longitudinally-extending sides spaced from said casing-wall, said disk containing a circular series of radially-extending openings and openings communicating with said radial openings and adapted to be moved into registration with the openings in said seat, said radially-extending openings communicating with said inlet when the valve is in both open and closed position.

6. A valve formed of a casing containing an inlet and outlet, a seat in said casing containing an opening, and a stem-equipped ro-

5 tary disk cooperating with said seat and having its longitudinally-extending sides and one face spaced from the walls of the casing, said disk containing a radial opening and
10 an opening extending through the underside of said disk and communicating with said radial opening, and adapted to be moved into registration with the opening in said seat, said radially-extending opening communicating with said inlet when the valve is in both open and closed position.

15 7. A valve formed of a casing containing an inlet and outlet, a seat in said casing containing a plurality of spaced openings, and
20 a stem-equipped rotary disk cooperating with said seat and having its longitudinally-extending sides and one face spaced from the walls of the casing, said disk containing a plurality of radially-extending openings, and openings extending through the underside of said disk and communicating with said radial openings and adapted to be moved into registration with the openings

in said seat, said radially-extending openings communicating with said inlet when the valve is in both open and closed position. 25

8. A valve formed of a casing containing an inlet and an outlet, a seat in said casing containing an opening, and a stem-equipped rotary disk cooperating with said seat and containing a passage opening at one end through a face of the disk and adapted to be moved into registration with the opening in the seat and opening at its opposite, inlet end through the side wall of the disk and presenting a wall opposed to the imperforate portion of said seat when the valve is closed against which the fluid in the valve impinges, the inlet end of said passage communicating with said casing-inlet when the valve is in both open and closed position. 30 35 40

FRED LOEDIGE.

In presence of:

R. A. SCHAEFER,
J. WILSON.