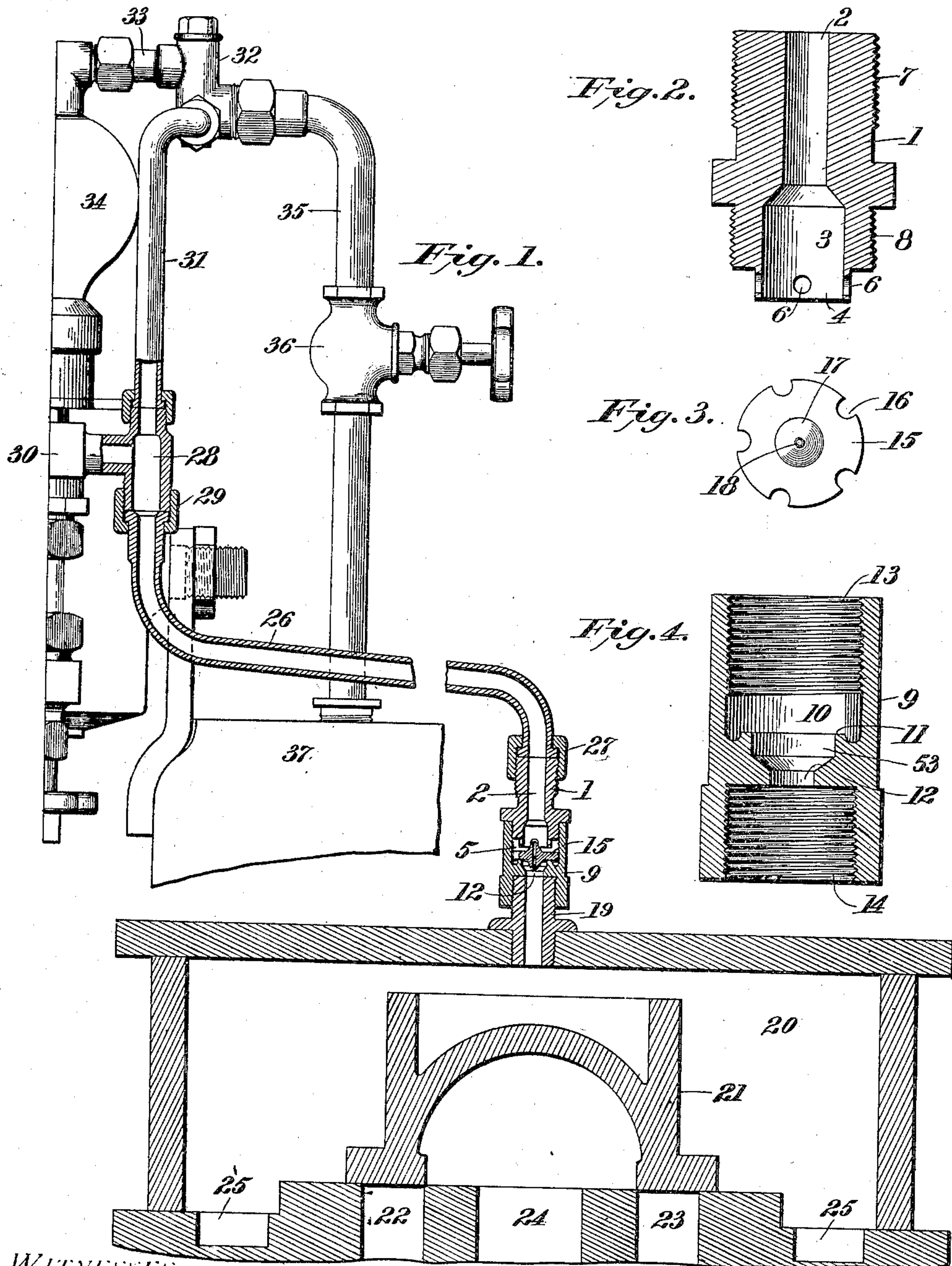


No. 726,414.

PATENTED APR. 28, 1903.

F. W. EDWARDS.
AUTOMATIC CHOKE VALVE.
APPLICATION FILED NOV. 14, 1901.

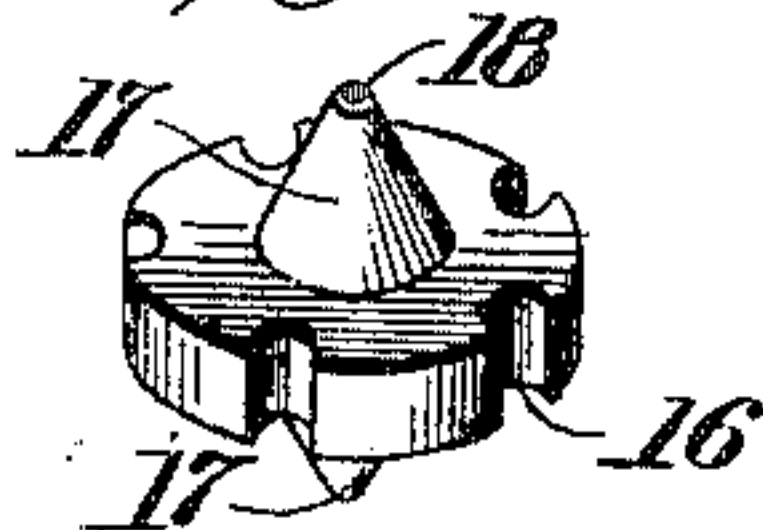
NO MODEL.



WITNESSES:

E. Walker
E. B. Bunker

Fig. 5.



INVENTOR

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UNITED STATES PATENT OFFICE.

FRANK W. EDWARDS, OF LOGANSFORT, INDIANA, ASSIGNOR TO THE CHICAGO LUBRICATOR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

AUTOMATIC CHOKE-VALVE.

SPECIFICATION forming part of Letters Patent No. 726,414, dated April 28, 1903.

Application filed November 14, 1901. Serial No. 82,329. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. EDWARDS, a citizen of the United States, residing at Logansport, in the county of Cass and State of Indiana, have invented a certain new and useful Improvement in Automatic Choke-Valves, of which the following is a full, clear, and exact description.

This invention relates to an automatic choke-plug for use more especially in lubricating the steam-chest of a locomotive-engine.

The invention comprises a choke-plug arranged upon the steam-chest and at the lower end of the tallow or oil-delivery pipe, said pipe being connected with a lubricator, such as a condensation-displacement lubricator, and also connected with the steam-chamber of the boiler and so constructed and arranged as to provide for a balancing of pressure, all as I will proceed now more particularly to set forth and finally claim.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is an elevation and partial section of sufficient of a locomotive boiler, engine, and condensation-displacement sight-feed lubricator to show the application of my invention, the novel choke-plug itself being in vertical section. Fig. 2 is a longitudinal section of the upper portion of the plug-casing. Fig. 3 is a plan view of the plug or valve proper. Fig. 4 is a vertical section of the lower portion of the plug-casing. Fig. 5 is a perspective view of the plug or valve proper.

The plug comprises a casing member 1, having an inlet-passage 2, leading into a chamber 3 of greater diameter, said chamber having its lower wall 4 reduced in thickness, so as to leave a surrounding annular chamber 5, and said wall provided with perforations 6. The edge of the wall 4 forms the upper seat for the valve proper. The member 1 has external screw-threads 7 and 8 at its opposite ends. The lower member 9 of the casing has a chamber 10 of substantially the same diameter as the external diameter of the portion 8 of the upper member of the casing and having a raised annular seat 11, surrounding

a chamber 53 of an internal diameter substantially equal to the internal diameter of the chamber 3, of which it is a complement, and the outlet 12 in this lower member 9 is reduced to substantially the diameter of the inlet 2. The member 9 is provided with an internal screw-thread 13 to receive the screw-threaded portion 8 of the upper member, and it is also provided with an internal screw-thread 14 for application to the position of use.

Within the chamber 10 and upon the seat 11 is arranged the plug or valve proper, 15, which in the preferred form and as shown comprises a disk having notches 16 in its periphery and having conical projections 17 from opposite faces and an opening or port 18, extending longitudinally through the projections 17.

The wall 4, in practical effect, is an upper retaining-seat for the valve or plug 15 and is effective in connection with perforations 6 to afford an increased passage-way for the lubricant when the valve is seated thereon, it being observed that the port or passage-way 18 is always open.

While I have thus described what I deem at this time the best embodiment of the principle of my invention, I wish to be understood as not confining the invention to the exact details of construction.

The preferred arrangement and use of the plug is illustrated in Fig. 1, wherein the plug is mounted upon a nipple 19, engaged by the screw-thread 14, and this nipple opens into the steam-chest 20 of ordinary construction and as here shown, containing a slide-valve 21, covering the live-steam ports 22 and 23, leading, respectively, to the rear end and front end of the cylinder, (not shown,) and an exhaust-port 24, leading to the atmosphere or elsewhere, as desired, and having the ports 25 connected with the boiler-pressure. 26 is the tallow-pipe or oil-delivery pipe, the lower end of which is connected with the choke-plug—as, for instance, by means of a coupling 27, engaging its portion 7—and said pipe is connected with the oil-receiving chamber 28 of the sight-feed lubricator by means of a coupling 29, and this oil-receiving cham-

ber is connected with the upper feed-arm 30 of said lubricator. A pipe 31 connects the oil-receiving chamber, and consequently the oil-delivery pipe, with a fitting 32, which by means of the fitting 33 is connected with the lubricator-condenser 34 on one side, and on the other side the pipe 35, having a globe or other valve 36, leads to the steam-chamber of the boiler 37, so that live steam may be introduced from the boiler into the oil-delivery pipe and thence to the choke-plug, as well as into the lubricator, and the supply of steam may be controlled by the valve 36.

As shown in the drawings, the slide-valve 15 in the steam-chest is in position to cover all of the steam-ports for the cylinder, and this is its position when the pressure is highest in the steam-chest. When in this position, the valve 15 in the choke-plug may be lifted against the edge of the wall 4, thereby increasing the opening to the steam-chest by way of the openings 6 in said wall and the notches 16 in the edge of the valve. Under these circumstances the steam-chest pressure forms a balancing pressure for the lubricator. If now the engine-valve 21 be moved to uncover one of the steam-ports to the cylinder, the valve or plug 15 will be seated at 11 by reason of the boiler-pressure in the oil-delivery pipe, and at this time the passage or port 18 is the only open port or passage-way for steam through the choke-plug, and, as is obvious, it is a relatively contracted passage. Under these conditions the steam is caused to balance back into the upper feed-arm and form a balancing pressure for the lubricator when the engine is standing or drifting with the throttle closed.

The oil in feeding out of the lubricator passes through the upper feed-arm and passage into the oil-receiving chamber 28, and thence into the oil-delivery pipe 26 by gravity or under steam-pressure, and since there is always an open passage through the choke-plug the oil will under the above conditions readily pass into the steam-chest as fast as it is fed from the lubricator.

The notches 16 in the disk or valve 15 constitute clearance-passages and also form guide-wings for the valve, and the holes 6 constitute vents communicating with the inlet-passage 2. The chamber 3 in the upper casing and cavity 53 in the lower casing when the casings are united constitute a relatively large chamber to render effective substantially the whole area of each side of the plug or valve 15.

By providing the valve or plug 15 with the conical extensions 17 the opening through it is considerably elongated, or, in other words, the length of the contracted passage is increased, and since the friction of the fluids tends to wear away the metal around this passage-way, and so enlarge it, the elongation of the passage-way adds life to it against such erosion, and so provides for the continued

passage of the lubricant in the proper small quantity, and, as already indicated, this contracted passage alone is operative when the engine is drifting or the throttle closed, and when the engine is working under steam-pressure with the throttle-valve open the lifting of the valve or plug renders the notches 16 available in addition to port 18 for increasing the passage from the oil-delivery pipe to the steam-chest. The conical portions 17 not only afford an elongated contracted passage-way, but they also obviate to a very great extent the liability of such passage-way being obstructed, and, furthermore, they make the valve reversible, so that it may be dropped into place either side up and work equally well, and this last capacity is specially important in replacing the valve after the parts have been separated.

Balancing pressure in the oil-delivery pipe is taken directly from the boiler, and there is a continuous passage from the boiler to the steam-chest at all times. The valve 36 controls the supply of steam to the lubricator and oil-delivery pipe, while the choke-plug controls the supply of steam immediately to the steam-chest. This valve 36 is wide open when the lubricator is in active operation and is closed only when the engine has finished a trip and the lubricator is completely shut off.

When the throttle-valve is open and steam is admitted into the engine's steam-chest, thereby starting the engine in motion, a back or pulsating pressure occurs in the steam-chest, and this pressure in turn acts on the valve or plug 15, causing it to be lifted or to be seated against the wall 4, thereby bringing the oil-delivery pipe into communication with the steam-chest not only through port 18, but also through the openings 6. Under these conditions the balancing pressure is formed by the steam from the engine's steam-chest coming into contact with the steam-pressure in the oil-delivery pipe. This gives an increased opening for the passage of the oil into the steam-chest and maintains the balance on the lubricator.

What I claim is—

A choke-valve, comprising a casing applied to and communicating directly with the steam-chest of an engine, and containing an enlarged chamber provided with a lower valve-seat and an upper perforated valve-restraining seat, and a plug fitted in said chamber and consisting of a peripherally-notched disk, the notches of which cooperate with the perforations in the upper seat when the disk is in contact with said seat to afford communication to and from the steam-chest around said choke-valve, said disk being adapted to close said communication when on its lower seat, and also having elongated projections upon opposite sides perforated longitudinally to form an elongated always-open contracted lubricant passage-way, combined with a lubricant delivery-pipe at the discharge end of

5 which the choke-valve is located, a condensation-displacement lubricator from which said delivery-pipe leads, and boiler connections with the said delivery-pipe and lubricator, whereby said valve-plug is responsive to variations in pressure between the steam-chest and lubricator or boiler.

In testimony whereof I have hereunto set my hand this 11th day of November, A. D. 1901.

FRANK W. EDWARDS.

Witnesses:

F. H. WIPPERMAN,
ELIZABETH HOMBURG.