L. G. KUNZER & J. H. LEWIS.

VALVE.

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1,183,012.

Patented May 16, 1916.

Fig. 1

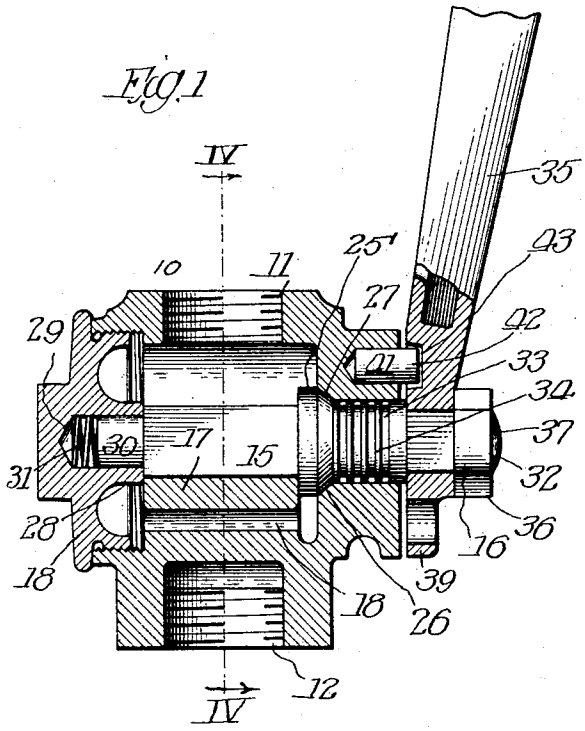


Fig. 2

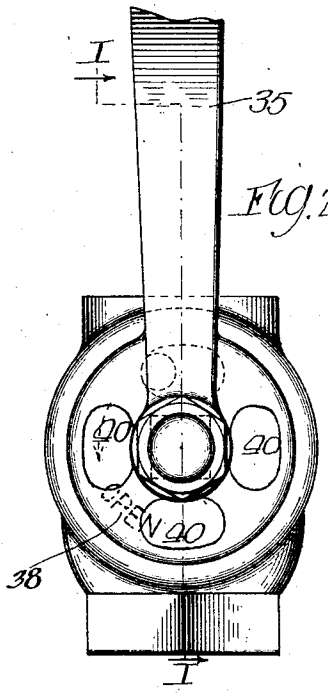


Fig. 3

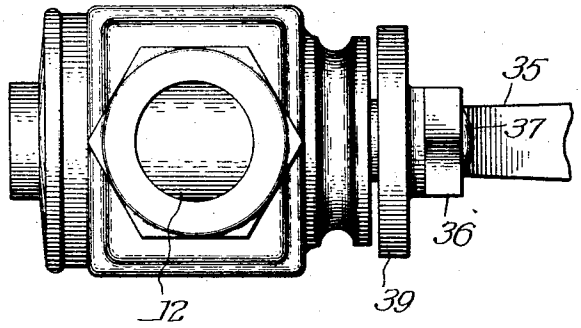
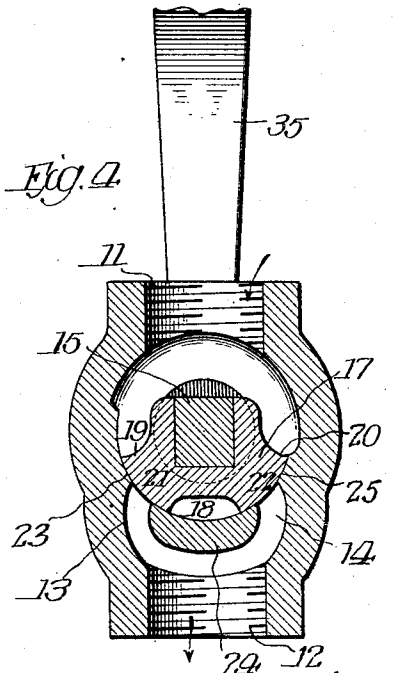


Fig. 4



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UNITED STATES PATENT OFFICE.

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VALVE.

1,183,012. Specification of Letters Patent. Patented May 16, 1916.

Application filed December 1, 1911. Serial No. 663,451.

To all whom it may concern:

Be it known that we, LOUIS GEORGE KUNZER and JOHN HENRY LEWIS, citizens of the United States, and residents of Chicago, in the State of Illinois, have invented certain new and useful Improvements in Valves, of which the following is a specification.

Our present invention relates in general to valves, and more particularly to types of valves constructed to be quickly opened, and to require no packing of the stem, and has special reference to the provision of an improved form of valve combining the quick-opening and packless features.

The principal objects of our invention are the provision of an improved construction of quick-opening and packless valves which may be opened with the greatest ease, and with a minimum of movement as well as of effort; the provision of a valve structure thus characterized wherein the valve is well balanced on its seat; the provision of improved arrangements of ground contacting surfaces whereby the use of a stuffing box containing packing or of other packing devices is avoided; the provision of an improved arrangement of ground joint and pressure device for the purpose stated; the provision of an improved form of indicator for showing the position of the valve; and generally to improve, cheapen and simplify valves of the present character; together with such further objects as may hereinafter appear.

Structures embodying our present improvements are available for a variety of purposes, but we find them peculiarly adapted for application to railway locomotives as blower-valves, where there is considerable demand for them in connection with so-called "smoke-consuming" arrangements, the manipulation whereof requires a valve which may be instantaneously opened with the least exertion in order to insure the desired use thereof to the end that the results sought may be efficiently attained.

A valve embodying our improvements, as will be manifest upon an inspection of the accompanying drawing, requires but a very short movement of the handle in order to throw it wide open, and actual test shows that under a steam pressure of two hundred pounds per square inch, the valve may be opened with pull of but six pounds on the operating handle.

In attaining the stated objects as well as certain further benefits and advantages to be below disclosed we have provided a construction of valve illustrated in preferred form in the accompanying drawing, wherein—

Figure 1 is a longitudinal sectional view of the valve structure, taken on the line I—I of Fig. 2, Figs. 2 and 3 are respectively an end view and an under plan view of the valve of Fig. 1; and Fig. 4 is a vertical sectional view taken on the line IV—IV of Fig. 1.

Referring first more particularly to Fig. 1, it will be noted that in carrying out our invention we employ a casing 10, which may be made of cast-iron and preferably provided with vertically disposed inlet and outlet openings 11, and 12, suitably threaded internally for the reception of the required pipe connections. For establishing communication between the openings 11 and 12 upon a short movement of the valve and its operating handle, we form in the wall of the casing 10, openings 13 and 14 (see Fig. 4) communicating with the opening 12 and with the interior of the casing.

Within the casing 10 the valve spindle 15 is longitudinally disposed, the casing being apertured at an end for the reception of the valve stem 16 and open at the opposite end for the introduction of the spindle and the valve 17 removably carried thereby, whereby replacement of the valve when worn or grinding either of it or of the casing portions contacting therewith may readily be effected.

To the end of further aiding in the quick opening of the valve, the valve 17 is grooved as indicated at 18 (Fig. 4) and cut away as indicated at 19 and 20, whereby the contact of the peripheral portions, 21, 22 of the valve with the corresponding surfaces 23, 24 and 25 is decreased materially, but not sufficiently to interfere with its efficient operation.

For the purpose of making a tight joint without the use of stuffing box constructions or other packing, the stem 16 is provided with a collar 25′ having a conically ground portion 26 seated in a complementarily

ground portion 27 of the casing 10, the ground joint thus attained being a substantially steam-tight joint. The valve 17 is normally held against the collar 25 by means of a boss 28 on the nut 18, which boss is bored as indicated at 29 for the reception of a stud 30 formed on the spindle 15, a spring 31 being interposed between the bottom of the housing thus formed and the end of the spindle, whereby the surfaces 26 and 27 are forced into contact and the ground joint thereby formed kept tight.

The stem 16 is provided between its projecting end 32 and the collar 25 with a plurality of grooves 33 and rings 34 arranged transversely of its axis to aid in maintaining the tightness of the joint. For the operation of the valve, the stem is provided with a lever handle 35 held in position by a nut 36 engaging a threaded portion 37 of the stem.

As is clearly to be seen on viewing Figs. 1 and 2, the handle 35 is intended to stand perpendicularly when the valve is closed, but in order to visibly indicate whether or not the valve is open the casing 10 is provided on its frontal aspect with a legend to-wit: as here shown the word Open as indicated at 38, such legend being normally covered by a flanged portion 39 provided on the handle, but visible through one of the openings 40 when the handle is moved to open position.

For limiting as well the closing as the opening movement of the handle, a pin 41 is inserted in the casing, the projecting portion 42 thereof engaging one of the openings 40 or a groove 43 formed in the handle.

In the operation of a valve embodying our improvements, as will readily be seen on reference to Fig. 4, a short movement of the handle 35 in either direction will cause the one of the valve portions 21 or 22 to uncover one of the corresponding openings 13 or 14, thus quickly establishing communication between the openings 11 and 12.

Having thus described our invention and illustrated its use, what we claim as new and desire to secure by Letters Patent is:

1. A valve device comprising, in combination, a casing, a valve rotatably mounted therein, and a handle for rotating the valve, said casing being provided with a legend, said handle being provided with means for covering said legend when in one position, and a plurality of openings one thereof to display said legend when in another position and said casing being provided with means engaging a recess in the handle for limiting the movement of the valve by the handle.

2. A valve device comprising, in combination, a casing having an open end, main inlet and outlet openings, one of said main openings having a plurality of secondary openings communicating with the interior of the casing, a valve stem rotatably mounted in the casing away from said open end and provided with means for rotating it at such end and at the opposite end with a valve portion adapted to cover and uncover said secondary openings progressively, said valve portion being removably mounted on the stem and insertible into the casing through said open end.

3. A valve device comprising, in combination, a casing having an open end and main inlet and outlet openings, one of said main openings having a plurality of secondary openings communicating with the interior of the casing distributed over an area of the casing subtending an angle of less than 180 degrees, a valve stem rotatably mounted in the casing away from said open end and provided with means for rotating it at such end and at the opposite end with a valve portion adapted to cover said secondary openings when in closed position, the covering portion of said valve portion being grooved and the valve being arranged in the casing when in closed position with the grooved portion lying intermediate said secondary openings.

4. A valve device comprising, in combination, a casing having an open end and main inlet and outlet openings, one of said main openings having a plurality of secondary openings communicating with the interior of the casing distributed over an area of the casing subtending an angle of less than 180 degrees, a valve stem rotatably mounted in the casing away from said open end and provided with means for rotating it at such end and at the opposite end with a valve portion adapted to cover said secondary openings when in closed position, the covering portion of said valve portion being grooved and the valve being arranged in the casing when in closed position with the grooved portion lying intermediate said secondary openings and being removably mounted on the stem.

5. A valve device comprising, in combination, a casing, a valve rotatably mounted therein and a handle for rotating the valve provided with a plurality of cut-away portions, the casing being provided with means engaging one of said cutaway portions by each of which cutaway portions the movement of the valve and the handle may be limited in opposite directions in a plurality of positions wherein the handle may be adjusted on the valve.

6. A valve device comprising in combination, a casing having main inlet and outlet openings, one of said openings having a plurality of secondary openings communicating with the interior of the casing distributed over an area of the casing subtending an angle of less than 180°, and a valve stem rotatably mounted in the casing and pro-

vided with a valve portion adapted to cover and uncover said secondary openings progressively.

7. A valve device comprising in combination, a casing having main inlet and outlet openings, one of said openings having a plurality of secondary openings distributed over an area of the casing subtending an angle of less than 180°, a removable valve adapted to cover and uncover said secondary openings progressively, a valve stem for rotating the valve, said stem and casing being provided with narrow complementarily ground portions coöperating to form a ground joint, the ground portion of the casing being formed integrally therewith, and means bearing on the casing and valve for forcing said complementarily ground portions into contact.

8. A valve device comprising in combination, a casing having main inlet and outlet openings, one of said main openings having a plurality of secondary openings communicating with the interior of the casing and distributed over an area of the casing subtending an angle of less than 180°, a valve stem rotatably mounted in the casing and provided with a valve portion adapted to cover such said secondary openings when in closed position, and means for rotating the valve, the covering portion of said valve portion being grooved and the valve being arranged in the casing when in closed position with the grooved portion lying intermediate said secondary portions.

9. A valve device comprising in combination, a casing having main inlet and outlet openings, one of said main openings having a plurality of secondary openings communicating with the interior of the casing and distributed over an area of the casing subtending an angle of less than 180°, a valve stem rotatably mounted in the casing and provided with a valve portion adapted to cover such said secondary openings when in closed position, and means for rotating the valve, the covering portion of said valve portion being grooved and the valve being arranged in the casing when in closed position with the grooved portion lying intermediate said secondary portions and being mounted non-rotatably but slidably radially on the stem.

10. A valve device comprising in combination, a casing having main inlet and outlet openings, one of said main openings having a plurality of secondary openings communicating with the interior of the casing, a valve stem projecting through an aperture in said casing and contacting with the walls thereof, and provided with a removable valve and means for rotating the valve, said stem and casing being provided with narrow complementarily ground portions coöperating to form a ground joint, the ground portion of the casing being formed integrally therewith, means bearing on the casing and valve for forcing said complementary ground portions into contact, and said valve portion being adapted to cover said secondary openings when in closed position, the covering portion of said valve portion being grooved and the valve being arranged in the casing when in closed position with the grooved portion lying intermediate said secondary openings.

In testimony whereof we have hereunto signed our names in the presence of the two subscribed witnesses.

LOUIS GEORGE KUNZER.
JOHN HENRY LEWIS.

Witnesses:
H. H. WARD,
MARTHA WESTMAN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."