F. GUY.

VALVE.

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1,198,537.

Patented Sept. 19, 1916.

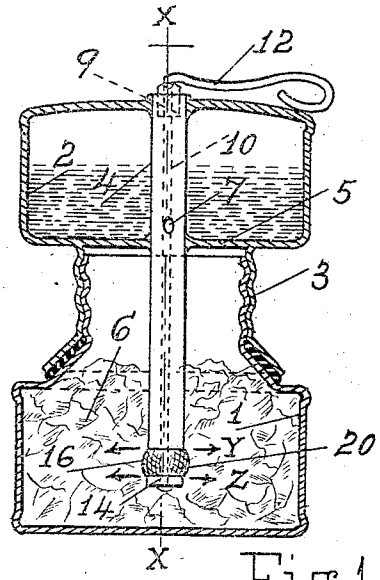


Fig. 1.

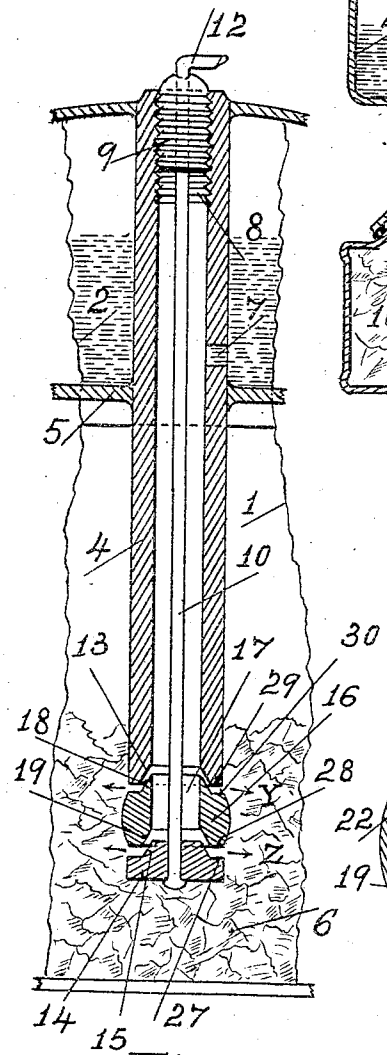


Fig. 2.

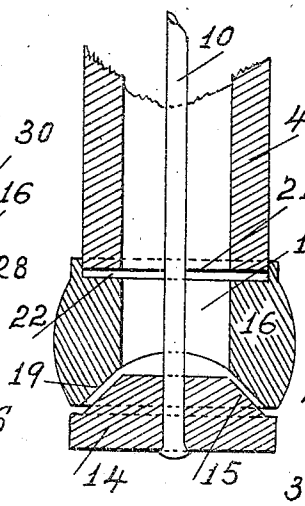


Fig. 3.

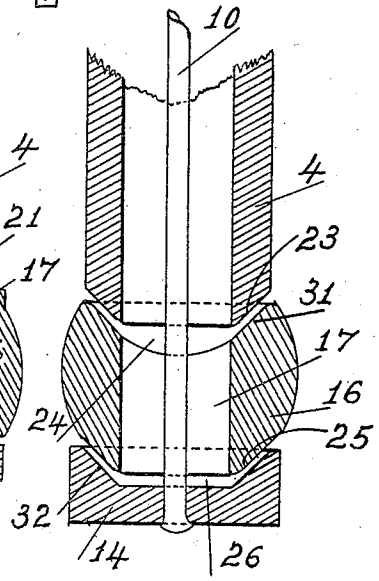


Fig. 4.

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UNITED STATES PATENT OFFICE.

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VALVE.

1,198,537. Specification of Letters Patent. Patented Sept. 19, 1916.

Application filed January 5, 1916. Serial No. 70,550.

To all whom it may concern:

Be it known that I, FRANK GUY, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a new and useful Valve, of which the following is a specification.

This invention relates primarily to valves for acetylene lamps, but is obviously applicable to other structures embodying a feed tube and a valve adjacent to the discharge end of the feed tube.

The purposes of my invention are: to provide a valve having a plurality of circumferential openings adapted to diffuse liquid radially, and means for accurately controlling simultaneous diffusion of liquid through all said circumferential openings; to provide,—in a valve,—in conjunction with a feed tube having a seat at one terminal of the tube, a valve stem, and a valve-plug in line with the tube; a rotatable member capable of grinding action on the tube and the plug and rotative independently of the valve stem and having a grinding surface complemental to the seat at the terminal of the tube and a grinding surface complemental to the seating surface of the valve-plug, to grind together the contacting surfaces of the rotatable member and the terminal seat of the tube, and the contacting surfaces of the rotatable member and the plug to remove any dirt or accretion between them and fit them accurately to each other; to provide a rotative grinder adapted for accurate centering with respect to the feed tube and the valve plug; to provide means to prevent longitudinal or lateral displacement of the grinder and to provide other new and useful features of construction.

The invention is illustrated in the annexed drawing, to which reference is hereby made, and will be hereinafter particularly described and finally recited in the claims.

Figure 1 is a diagrammatic longitudinal section of an acetylene lamp embodying the invention, and shows the valve and appurtenances in elevation. Fig. 2 is an enlarged partial longitudinal section on the line X. X. of Fig. 1, and Figs. 3 and 4 are enlarged sectional diagrams illustrating details of modified forms of the valve.

Similar reference numerals designate like parts in the different views.

I will first describe the preferred construction illustrated in Figs. 1 and 2 and will afterward describe the modified forms shown in the other views.

The lamp body which may be of any suitable material and of any suitable form, preferably comprises a carbid box 1 and a reservoir 2, detachably connected with each other preferably by a screw connection 3. The feed-tube 4 is fixed in the reservoir and extends through the reservoir bottom 5 and downward into the mass of carbid 6 in the box 1. An opening 7 in the wall of the tube 4 admits liquid from the reservoir into the tube. Adjacent to the upper terminal of the tube is an internally screw threaded part 8 in which the screw 9 engages. The valve stem 10 is co-axial with and extends downwardly through the tube 4. The screw 9 is unitary with the stem 10. A handle 12 in fixed relation to the screw 9, serves to rotate the screw to cause longitudinal movement of the stem 9. The handle 12 is preferably a continuation of the valve stem 10, bent as shown; but the handle may be made separately and may be rigidly connected with the screw without departure from my invention.

The tube 4 has a flared part 13 and a flat terminal 29. The circular plug 14 is fixed on the stem 10 and has a tapered part 15 and a flat circular ledge 27. The bulb-like rotatable member 16 has a central bore 17 of substantially the same caliber as the bore of the tube 4 to permit unobstructed flow of liquid within the tube and within the rotatable member and also has a tapered part 18 conformed to the flared part 13 of the tube 4, a circumferential ledge 30 adapted to grind and seat on the flat terminal 29 of the tube 4, a flared part 19 conformed to the tapered member 15 of the plug 14 and a flat terminal 28 adapted to seat and grind on the ledge 27 of the plug 14. The inclined surface of the part 15 of the plug engages on the inclined surface of the rotatable member to bring it into line with the tube and the plug and prevent lateral displacement of the plug or the rotatable member. When the parts are assembled and the valve is slightly opened liquid from the tube will be diffused radially through the space between the ledge 27 of the plug and the flat terminal of the rotatable member and between the ledge 30 of the rotatable member and the flat terminal 29 of the tube 4.

The periphery of the rotatable member is

solid—that is to say without apertures or perforations and is preferably knurled as at 20 to facilitate manipulation of the rotatable member. The bore of the rotatable member registers with the bore of the tube in order that liquid may flow freely through both bores to the plug. If the valve becomes clogged by dirt or ash accumulating on the plug, the screw 9 may be turned to cause slight downward movement of the plug, and thereupon the rotatable member may be pressed downward against the plug and may be rotated by hand to grind the member 28 on the member 27 to crush and remove the accretion, and if the rotatable member be then raised slightly, water from the tube will flow between the members 19, 15, 27 and 28 and will thoroughly cleanse them. If the valve becomes clogged by dirt or ash accumulating on the terminal 29 or on the part 30, the valve may be slightly opened and the rotatable member may be pushed upward against the seat 29 and may be rotated by hand to crush and remove the accretion and to accurately grind the parts 29 and 30 on each other.

It is found in practice that when the parts are accurately fitted and assembled as described, slight opening of the valve will cause radial diffusion of liquid through the circumferential opening between the parts 29 and 30 as indicated by arrows Y and simultaneous radial diffusion of liquid through the circumferential opening between the parts 27 and 28, as indicated by arrows Z.

A valve having a plurality of circumferential openings adapted for radial diffusion of liquid as described is of special value in acetylene lamps of the type in which the lower part of the valve is immersed in the mass of carbid and the water emerging from the valve is subject to the absorbent action of the carbid, as shown in Fig. 1, in that the plurality of accurately adjustable circumferential openings causes more uniform radial diffusion of liquid throughout the mass of carbid than has hitherto been attained, resulting in more uniform generation of gas; and the means for accurate control of the simultaneous discharge of liquid through all the openings facilitates convenient and complete control of the generation of gas to suit all the different conditions of use.

Fig. 3 illustrates a modified construction in which the terminal 21 of the tube 4 is flat and the rotatable member 16 has a circular recess 22 accommodating the terminal of the tube and the wall of the recess serves to prevent lateral displacement of the rotatable member. In this view, the tapered surface of the plug or closure 14 engages on the flared surface 19 of the rotatable member and co-acts therewith to assure accurate alinement of the parts and prevent lateral displacement of the rotatable member and the plug or closure relative to the tube.

Fig. 4 illustrates a modified construction in which the rotatable member 16 has a concavity 24 having an inclined wall 31 adapted to engage on the complemental tapered terminal 23 of the tube 4 and has a convex part 25 adapted to engage on the wall 32 of a complemental concavity 26 in the plug 14. In all the different forms the rotatable member is adapted to be rotated between the plug and the terminal of the tube and means are provided to prevent lateral displacement of the plug relative to them.

To distinguish that part of the tube 4 with which the grinder 16 contacts, I call it the terminal of the tube. It is obvious that, without departure from my invention, said terminal of the tube may be flared and flattened as shown in Fig. 2, or flat as shown in Fig. 3, or tapered as shown in Fig. 4, or may be of other and different forms which will readily occur to persons skilled in the art; it is also obvious that the closure 14 may be of various and different forms; and the rotatable grinder member 16 may be of correspondingly various and different forms. It is essential only that the terminal of the tube shall have a continuous or unbroken surface; that the closure shall have a continuous or unbroken surface, and that the rotatable grinder member shall have a continuous and unbroken periphery, a continuous and unbroken surface complemental to and adapted to grind on the terminal of the tube and a continuous and unbroken surface complemental to and adapted to grind on the closure.

Other analogous or equivalent modifications will readily occur to persons skilled in the art and need not be detailed here. It is essential only that the rotatable member shall be rotative between the plug or closure and the terminal of the tube and shall be safeguarded against lateral displacement relative to them. I wish to avail myself of all fair equivalents.

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

1. In a valve, the combination of a stationary tube having a terminal valve-seat; a plug co-axial with and movable longitudinally of the tube; and a circumferentially imperforate rotatable member adapted to grind on the terminal valve seat and also adapted to grind on the face of the plug.

2. In a valve structure, the combination of a tube adapted to convey liquid and having a flared terminal with a continuous and unbroken periphery; a valve stem capable of longitudinal movement within the tube; means for controlling longitudinal move-

ment of the valve stem; a closure rigid on the valve stem and having a tapered part with a continuous and unbroken periphery; and a centrally perforated and circumferentially solid rotatable member between the closure and the terminal of the tube and having a tapered part with a continuous and unbroken periphery complemental to the continuous and unbroken periphery of the flared terminal of the tube and a flared part having a continuous and unbroken periphery complemental to the continuous and unbroken periphery of the tapered part of the closure.

3. In a valve structure, the combination of a tube adapted to convey liquid and having a terminal valve seat; a stem capable of longitudinal movement within the tube; means for controlling longitudinal movement of the stem; a plug rigid on the stem and having a tapered surface; and a rotatable member between the plug and the end of the tube and having surfaces conformed to the terminal valve-seat of the tube and the contacting surface of the plug and adapted to grind on the valve-seat and on said contacting surface of the plug and also adapted to prevent lateral displacement of said rotatable element.

4. In a valve structure, the combination of a stationary tube having a continuous terminal; a stem connected with the tube and capable of longitudinal movement in the tube; a closure rigid on the stem and having a continuous and unbroken face; and a rotatable member between and independent of both the tube and the closure and having a continuous and unbroken periphery, a continuous face complemental to the continuous terminal of the tube, and a continuous face complemental to the continuous face of the closure.

5. In a valve structure, the combination of a stationary tube having internal screw threads; a stem within the tube; a plug and a screw unitary with the stem, said screw being adapted to engage the internal screw threads of the tube; means for rotating the screw; and a rotatable member between the plug and the tube and adapted to engage on both.

6. In a valve structure, the combination of a tube adapted to convey liquid; a valve stem movable longitudinally within the tube; a valve plug unitary with the stem and having a tapered part and a flat ledge; and a centrally perforated and circumferentially solid rotatable member between the plug and the tube adapted to rotate between the tube and the plug and independently of the stem and adapted to be engaged on the terminal of the tube and having a flared part adapted to be engaged on the tapered part of the plug, and a flat terminal adapted to grind on the flat ledge of the plug.

7. A valve structure comprising a stationary tube having a continuous smooth terminal; a closure in line with and movable longitudinally of the tube and having a smooth continuous face; and a centrally perforated and peripherally imperforate rotatable member between the closure and the terminal of the tube and adapted to rotate independently of the tube and the closure and having a smooth continuous surface adapted to engage the terminal of the tube and a smooth continuous surface adapted to engage the face of the closure.

In witness whereof I have hereunto signed my name at Springfield, Illinois, this 30th day of December 1915.

FRANK GUY.

Witnesses:
ROY G. TROXELL,
S. ALLYNN TROXELL.