W. E. COAKLEY.

VALVE.

APPLICATION FILED DEC. 7, 1917.

1,298,668. Patented Apr. 1, 1919.

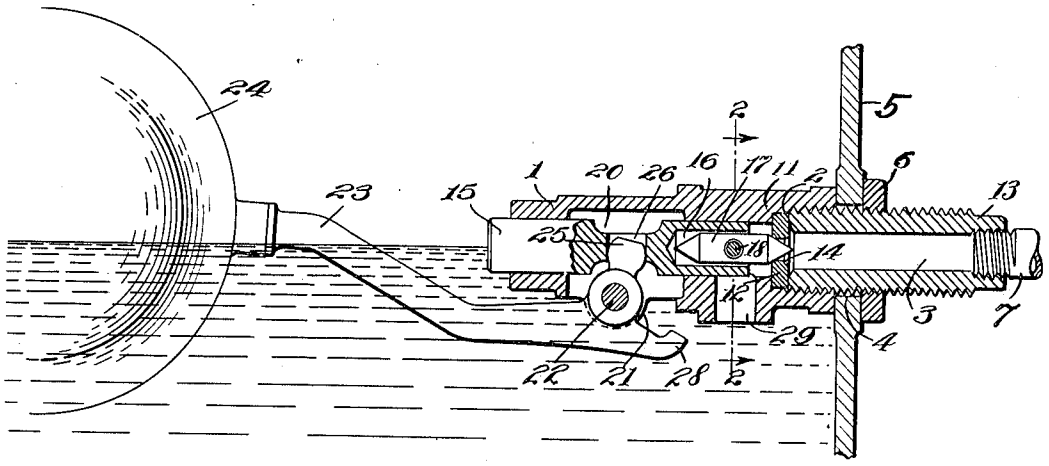


Fig. 1.

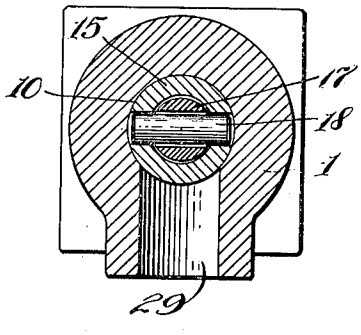


Fig. 2.

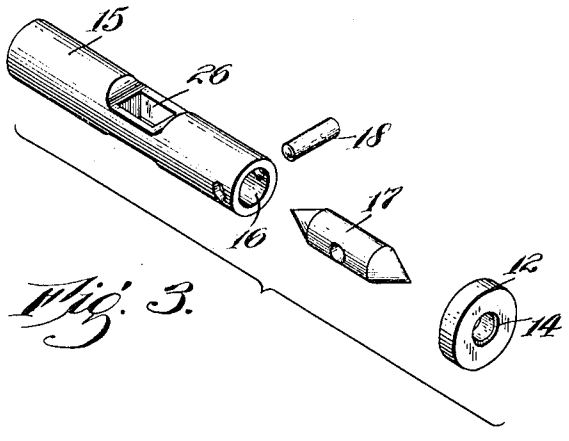


Fig. 3.

Inventor,
William E. Coakley.

By Hull, Smith, Brock & West
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM E. COAKLEY, OF CLEVELAND, OHIO, ASSIGNOR TO THE OHIO BLOWER COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

VALVE.

1,298,668. Specification of Letters Patent. Patented Apr. 1, 1919.

Application filed December 7, 1917. Serial No. 206,092.

To all whom it may concern:

Be it known that I, WILLIAM E. COAKLEY, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to improvements in valves, and in the present instance the improvements are shown as embodied in a float valve, although the invention will be understood as having a broader field of use.

The general objects of the invention are to cheapen the cost of production and maintenance of valves, and to very materially prolong their life. Further, to provide a construction affording quick and convenient renewal of worn out parts, and withal to insure a maximum of efficiency.

To these ends my invention consists in providing a reversible and renewable valve-seat; a reversible and renewable valve-plug; a structure wherein the valve-seat may be quickly and conveniently inserted; a plunger reciprocable within a bore of the structure and to which the valve-plug may be loosely connected, wherefore it will adjust itself to accurately and tightly seat, the valve-plug being connected to the plunger by means of a pin held in place by coöperation with the walls of the bore; and wherein the plunger is retained against withdrawal from the bore by the float lever, which in turn is connected to the structure by an easily removable pin.

It follows from this that, by simply removing the pin which connects the float lever to the valve casing or structure, the plunger may be withdrawn and the valve-plug removed for the purpose of reversal or renewal. The valve casing is constructed of separable parts between which the valve-seat is clamped and a separation of these parts affords access to the valve-seat for the purpose of reversing or renewing it. These structural details will be better understood by reference to the accompanying drawing.

Figure 1 is a longitudinal section through the valve, showing it applied to the wall of a tank; Fig. 2 is an enlarged section on the line 2—2 of Fig. 1; and Fig. 3 shows in perspective the plunger, valve-plug, the pin for connecting the plug to the plunger, and the valve-seat, in separated condition.

One end of the casing 1 is recessed at 2 and is internally threaded for the reception of an externally threaded extension 3 which passes through an aperture 4 in the tank wall 5 and is adapted to have applied to it a nut 6 for clamping the casing to the wall. A supply pipe 7 is threaded into the outer end of the extension 3. The casing 1 is provided with a central bore 10 of smaller diameter than the recess 2, wherefore a shoulder 11 is provided against which a disk 12 is adapted to be firmly clamped by the extension, the outer end of the extension being provided with a wrench receiving portion 13, enabling the extension to be firmly screwed into place. The disk 12 constitutes the reversible valve-seat hereinbefore mentioned, and accordingly will be referred to hereinafter as such. The recess 2 is substantially concentric with the bore 10 and is enough greater in diameter than the valve-seat to permit of the easy introduction of the seat while assuring that the seat will be accurately located with its central aperture 14 in axial alinement with the bore 10.

The valve-seat 12 is preferably made of comparatively hard non-corrosive metal, and each end of its bore 14 is countersunk to very accurately fit the taper of the valve plug.

A plunger 15 is guided within the bore 10 of the casing and its forward end is recessed at 16 for the reception of the valve-plug 17, the valve plug and opposed walls of the recess 16 being provided with alining apertures for the reception of a pin 18 of less diameter than said apertures and of a length less than the diameter of the bore.

The valve-plug fits loosely within the recess 16 so that it may move, to a limited extent, in all directions. Therefore, when the plunger is advanced toward the valve-seat by the action of the float lever, as will hereinafter be explained, the advancing end of the plug accurately finds its seat within the adjacent tapered end of the bore 14, it being recalled that the taper of the valve-plug and seat are identical, wherefore a tight fit between the parts is insured.

The valve-plug is preferably made of comparatively hard non-corrosive metal, and has both of its ends tapered so that it may be reversed to present a new working surface to the valve seat when one has become worn. These plugs may be "turned" from ordinary stock rod of proper quality and therefore produced very cheaply.

Toward its inner end, the casing 1 is shaped to produce a chamber 20 which opens through the side of the casing, and the opposed walls of the chamber are provided with perforated ears 21 within which are journaled the ends of a pin 22 that has pivoted upon it, between the ears, a float lever 23. This lever has attached to its outer end the usual float 24. An extension 25 on the inner end of the float lever occupies a socket 26 in the plunger 15 and acts to reciprocate the plunger as the lever is oscillated upon its pivot by the rise and fall of the float. The float lever is limited in its downward movement by the engagement of a finger 28 with an adjacent portion of the casing 1.

The operation of the valve is obvious. As the liquid level within the tank drops, the float descends and rocks the lever 23 to move the plunger in a direction to withdraw the valve-plug from engagement with the seat, permitting a flow of the liquid in through the supply pipe, 7, the extension 3, the bore 10 and casing outlet 29. As the supply is replenished and the liquid level rises, the float 24 is elevated and the aforesaid operation reversed to seat the valve and stop the inflow of liquid.

From the foregoing description it will be seen that my invention provides a comparatively simple valve construction wherein the only parts subjected to appreciable wear may be cheaply, quickly, and easily reversed or renewed. Also attention is recalled to the fact that in my improved construction the valve-seat and valve-body are originally provided with accurately fitting coöperating parts, permitting the parts to be made of comparatively hard metal, thus greatly prolonging their life, as well as insuring a perfectly tight fit.

Having thus described my invention, what I claim is:

1. A valve comprising, in combination, a casing having a bore and a valve seat disposed at one end thereof, a plunger movable within the bore toward and from the valve seat, the end of the plunger adjacent the valve seat being recessed, a cylindrical valve plug having its ends tapered inwardly from its diameter and loosely fitting within the recess, the valve plug having a transverse aperture substantially midway of its ends, means extending through said aperture for removably retaining the valve plug within the recess, and means for moving the plunger.

2. A valve comprising, in combination, a casing having a guideway, a valve seat disposed at one end of the guideway, a member movable within the guideway toward and from the valve seat, the end of the member adjacent the seat being recessed, a valve plug fitting loosely within the recess and having opposite ends of identical formation for cooperation with the seat, the valve plug and member having alining apertures, a pin loosely fitting within the apertures of the valve plug and member and confined therein by a portion of the guideway, and means for moving the aforesaid member.

3. A valve comprising, in combination, a casing having a guideway, a valve seat disposed at one end of the guideway, a member movable within the guideway toward and from the valve seat, the end of the member adjacent the seat being recessed, a valve plug fitting loosely within the recess and having opposite ends of identical formation for coöperation with the seat, the valve plug and member having alining apertures, that of the plug being midway of its ends, a pin loosely fitting within the apertures of the valve plug and member and confined therein by opposed portions of the guideway, and means removably carried by the casing for actuating the aforesaid member and retaining it within the guideway.

4. A valve comprising, in combination, a casing having a bore and a valve seat disposed at one end thereof, a member movable within the bore toward and from the valve seat, the end of said member adjacent the valve seat having a recess, a cylindrical valve plug fitting loosely within the recess and having its opposed ends correspondingly tapered inward from the diameter of the plug, the valve plug and member having alining apertures, a pin fitting loosely within said apertures and retained therein by the wall of the bore, and means for actuating the aforesaid member.

5. A valve comprising, in combination, a casing having a bore and a valve seat disposed at one end thereof, a member movable within the bore toward and from the valve seat, the end of said member adjacent the valve seat having a recess, a cylindrical valve plug fitting loosely within the recess and

having its opposite ends correspondingly tapered inward from the diameter of the plug, the valve plug and member having alining apertures, a pin fitting loosely within said apertures and retained therein by the wall of the bore, a pivotal member carried by the casing, and an actuating member removably carried thereby and having a portion extending into the casing for interengagement with the aforesaid member thereby to actuate the member and retain the same against withdrawal from the bore.

In testimony whereof, I hereunto affix my signature.

WILLIAM E. COAKLEY.