

Dec. 18, 1934.

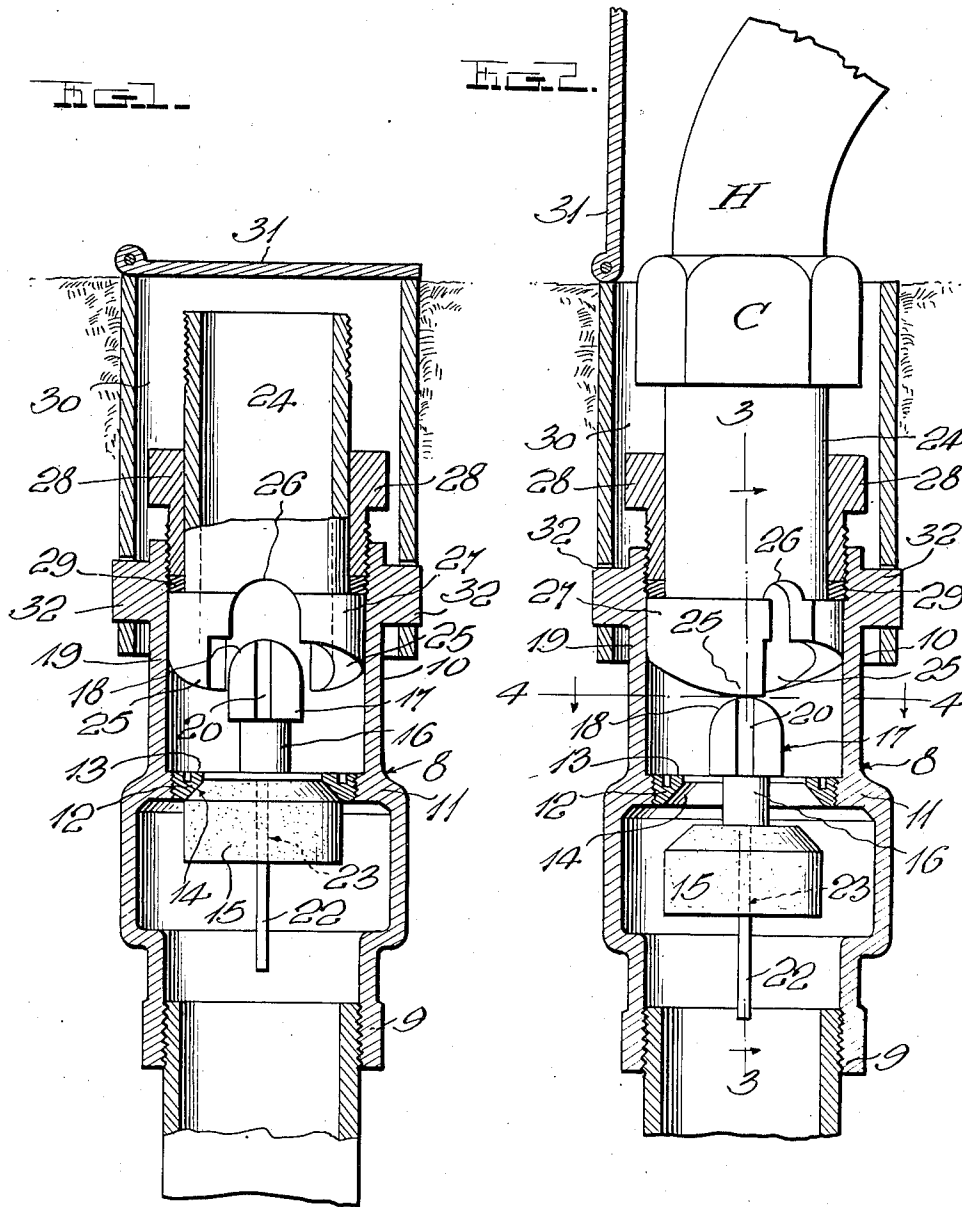
P. RIEDEL

1,984,497

VALVE

Filed July 20, 1933

2 Sheets-Sheet 1



Witness

H. Woodard

Inventor

Peter Riedel

By

H. B. Wilson & Co.

Attorneys.

Dec. 18, 1934.

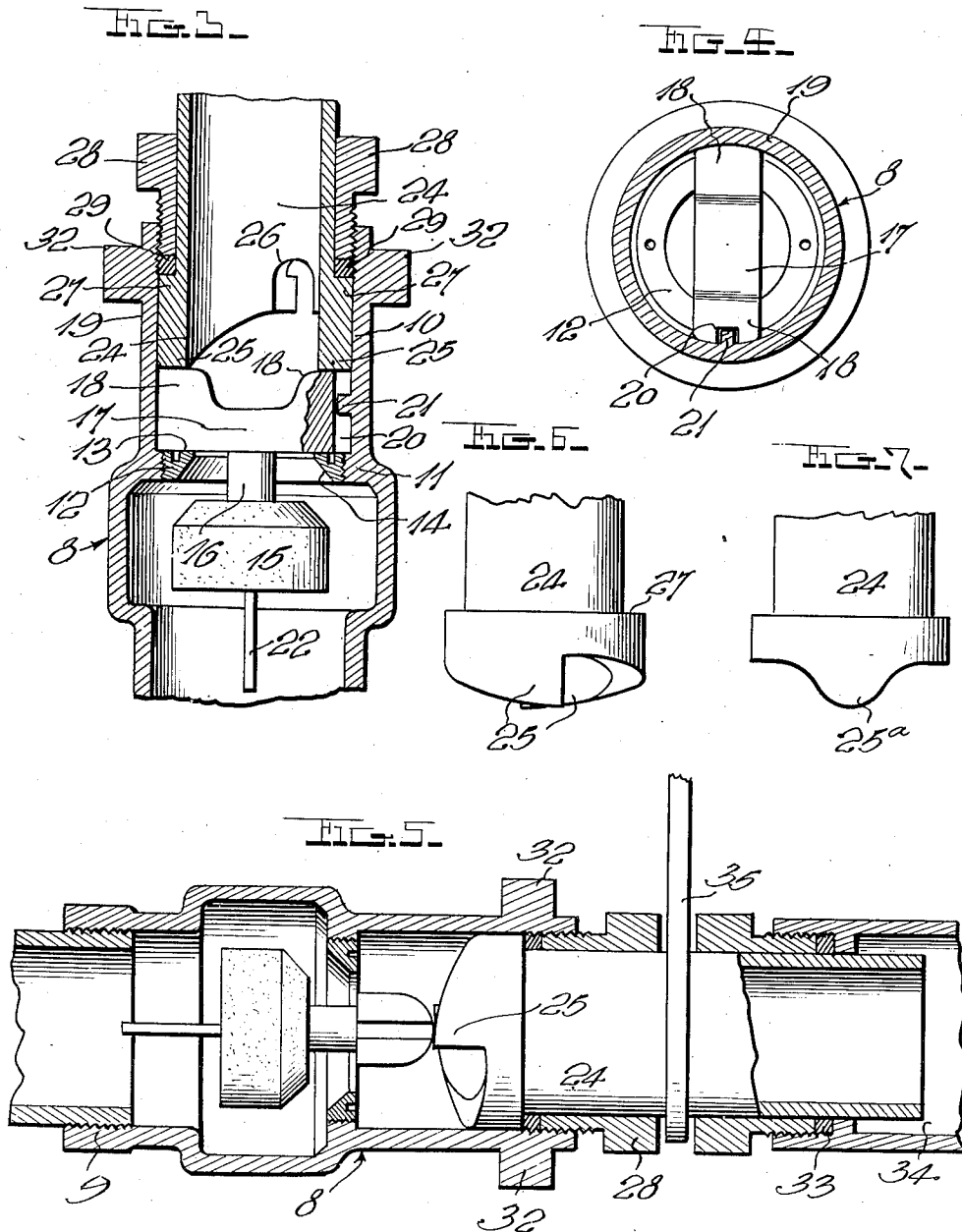
P. RIEDEL

1,984,497

VALVE

Filed July 20, 1933

2 Sheets-Sheet 2



Inventor

Peter Riedel

Witness
H. Woodard

By *H. Blumson & Co.*
Attorneys.

UNITED STATES PATENT OFFICE

1,984,497

VALVE

Peter Riedel, Santa Barbara, Calif.

Application July 20, 1933, Serial No. 681,351

6 Claims. (Cl. 137—13)

The invention relates to a new and improved valve of the general type in which a discharge tube for the fluid extends rotatably into the valve body and is rotated to effect opening and closing of the valve.

It is one object of the invention to provide an exceptionally simple and inexpensive valve of the type set forth, yet one which will be efficient and reliable. The valve is provided with a central neck having a cross head which is slidably and non-rotatably mounted within the valve body or casing, and the discharge tube is provided with cams co-operable with said cross head to force the valve from its seat, said valve being normally held seated by the fluid pressure held in check thereby, and a further object is to provide solid abutment means against which the aforesaid cams tightly hold said cross head while the valve is fully open, thereby holding said valve and parts connected therewith against chattering.

Another object of the invention is to provide the valve body and the fluid discharge tube with co-acting means inter-engageable by inward sliding of said tube, for holding the tube temporarily against rotation when desired, for instance when connecting a hose or other fluid conductor to or disconnecting it from the outer end of said tube.

The invention is usable for a wide variety of purposes, some of which are to individually control sprinklers set into the ground, to control the discharge of water from hydrants or the like, particularly when such hydrants are rendered accessible only by lifting a cover plate which is normally flush with the ground, sidewalk or the like, for controlling the discharge of water into closet bowls for flushing, etc.

With the above objects in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is a vertical sectional view showing the valve embodied in a hydrant which is accessible only when a cover plate is raised, the valve being shown in closed position.

Fig. 2 is a view similar to Fig. 1 but showing the hose attached and the valve held solidly in open position.

Fig. 3 is a detail vertical sectional view on line 3—3 of Fig. 2.

Fig. 4 is a horizontal sectional view on line 4—4 of Fig. 2.

Fig. 5 is a sectional view showing a flush valve constructed in accordance with the invention.

Figs. 6 and 7 are side elevations showing dis-

charge tubes having inner end constructions somewhat different from that shown in preceding views.

In the drawings above briefly described, the numeral 8 denotes a substantially cylindrical hollow body having a fluid inlet 9 at one end, the opposite end 10 of said body being open. Between its ends, the body is provided with an internal ledge 11 of annular form which may be formed in part by a removable ring 12. The axis of the ledge 11 and its ring 12, is in line with the axis of the open valve body end 10, and the side of the ledge and ring toward said open end are in a plane at right angles to said axes to constitute an annular abutment 13. The opposite side of the ring 12 is preferably beveled and constitutes an annular valve seat 14 facing the inlet 9.

A valve 15, preferably formed from rubber, is provided to seat against the seat 14, said valve being provided with a central neck 16 which extends toward the open end 10 of the body 8. This neck is provided with a diametrically extending cross head 17 having curved end faces 18 which lie slidably against the interior of the cylindrical side wall 19 of the casing or body 8. At least one end of the cross head 17 is formed with a groove 20 slidably engaged with a lug 21 on the wall 19, so that the cross head cannot rotate.

The neck 16 is preferably provided with a central projecting stud 22 which passes through a central opening 23 in the valve 15 and frictionally engages the wall of said opening to hold the valve and neck in assembled relation. The neck and the cross head 17 may well be integral with each other and the same is true of said neck and the stud 22 although the latter may well be threaded into said neck if desired.

A fluid discharge tube 24 passes rotatably into the body 8 through the open end 10 of the latter, the inner end of said tube 24 being provided with valve opening cams which are denoted at 25 in most views. Fig. 7 however, discloses somewhat different cams which are given the reference character 25^a. These cams 25 or 25^a are co-operable with the end portions of the cross head 17 to force this cross head toward the ledge 11 when the tube 24 is turned in the proper direction, thereby opening the valve 15. The cams are of such size that they force the cross head 17 entirely to the ledge 11 and may thus solidly hold said cross head against said ledge while the valve stands fully open as seen in Figs. 2 and 3, the unit formed by the parts 15, 16, 17 and 22, being thereby held against chattering.

When the discharge tube 24 is turned in the reverse direction, the valve 15 is allowed to close, the closing movement of said valve being effected by the pressure behind said valve.

5 In Figs. 1 and 2, it is intended that a hose (H in Fig. 2) be coupled by the usual coupling C to the outer end of the discharge tube 24. It is therefore necessary to hold this tube against rotation in valve-opening direction, while said coupling is being threaded onto or from said tube. To accomplish this, I provide the inner end of the tube 24 with notches 26 which will receive the ends of the cross head 17, when said tube is pushed inwardly. The coupling C may thus be engaged with or disengaged from the tube 24, without danger of the latter rotating and effecting undesired movement of the valve 17, and when said tube is again pulled outwardly, it is in readiness for rotation to effect valve operation.

20 The inner end portion of the tube 24 is provided with an outwardly facing continuous shoulder 27, a gland 28 is threaded into the open end of the body 8 so that the inner end of said gland constitutes an inwardly facing continuous shoulder, and a packing ring 29 is interposed between the two shoulders. When the tube 24 is rotated to force the valve 15 from its seat 14, these shoulders and the ring 29 receive the thrusts exerted by the cams 25 or 25^a on said tube, and when the cams finally force the cross head 17 solidly against the ledge 11, the endwise outward thrusts on tube 24, serve to very tightly clamp the ring 29 between the shoulder 27 and the inner end of the gland 28, thereby overcoming any danger of leakage.

In the construction shown in Figs. 1 and 2, the tube 24 and the upper portion of the body 8 are surrounded by a casing 30 having a hinged cover 31, said casing being connected with said body by projecting studs 32 on the former received in openings in the latter. These studs may also be used in rotating the body 8 when threading it onto a water supply pipe or main. 45 This pipe or main, the body 8 and the casing 30 are intended to be embedded in the ground or in a pavement, side-walk or the like, with the cover 31 substantially flush with the surface, so that access may be had to the tube 24 by raising said cover. In the construction so far described, it is intended that a conventional hose be connected with the outer end of the tube 24, but obviously the invention is not restricted to use with a hose, for any desired fluid conducting means could be mounted upon or connected with this tube, one of the principal uses of the invention being in connection with a sprinkler embedded in the ground with only its upper end accessible. Regardless of what kind of fluid conducting means be connected with the outer end of tube 24, rotation of the latter serves to effect valve opening and valve closing.

In the flush valve shown in Fig. 5, the outer end of the discharge tube 24 is swiveled at 33 in a pipe section 34 leading to a toilet bowl, and a lever 35 is secured to said tube 24 between the swivel 33 and the gland 28, so that the tube may be rotated to effect valve opening or valve closing, as desired. Obviously, this construction is not restricted to use as a flush valve but could be employed for any other purpose. The lugs 32 in this construction need not be engaged with any casing such as 30, but may well constitute 75 convenient means for either holding the body 8

or for rotating said body, when assembling or disassembling parts.

Fig. 6 discloses the fact that the inner end of the tube 24 need not have the notches 26, unless it be embodied in an assemblage requiring that said tube be held against rotation at one time or another.

Fig. 7 merely shows that the cams on the tube 24 are not restricted to the shape shown in the other views. The cam shown in Fig. 7 will permit the valve to be opened and closed by turning the tube 24 always in the same direction, whereas when the cams 25 are used, said tube is turned in one direction to force the valve from its seat and is turned in the other direction to allow valve closing.

It will be seen from the foregoing that novel and advantageous structure has been provided for carrying out the objects of the invention. While preferred details have been disclosed, variations may, of course, be made within the scope of the invention as claimed.

I claim:—

1. A valve comprising a hollow body containing a valve, a stop for limiting the opening movement of said valve, a discharge sleeve extending rotatably into said body, said sleeve being adapted to remain permanently assembled with the body and having means on its outer end for detachable connection with an extraneous hose coupling, a cam on the inner end of said discharge sleeve for forcing said valve open to the extent allowed by said stop and for simultaneously exerting an outward end thrust on the sleeve, a continuous external shoulder on said discharge sleeve facing toward the outer end of the same, a second continuous shoulder in said body facing the sleeve shoulder, and a packing ring surrounding said discharge sleeve between and in contact with said shoulders, whereby the outward thrust on the discharge sleeve when the valve is forced open to the limit allowed by said stop will tightly clamp said packing ring between said shoulders.

2. In a valve of the type in which a discharge tube extends into a valve body and is rotatable to operate a valve within said body; means operable by inward sliding of said tube to temporarily prevent rotation of the latter with respect to said body, said means including one portion rigidly carried by said discharge tube, and a relatively fixed portion non-rotatably connected with said body, said two portions being normally separated and being operatively engageable by said inward sliding of said discharge tube.

3. In a valve of the type in which a discharge tube extends into a valve body and is rotatable to operate a valve within said body; means for holding said valve against rotation within said body, and co-acting means on said discharge tube and valve engageable by inward sliding of said tube to temporarily hold the latter against rotation with respect to said valve.

4. In a valve, a hollow body having an open end and a valve seat at right angles to the axis of and facing away from said open end, a valve co-operable with said seat and having a central neck extending toward said open end, said neck being provided with a slidably and non-rotatably mounted cross head between said seat and said open end, abutment means at the end of the valve-opening travel of said cross head, a discharge tube extending rotatably into said body

through said open end thereof, said discharge tube being adapted to remain permanently engaged with said body and having means at its outer end adapting it for detachable connection with an extraneous hose coupling, said discharge tube having valve-opening cam means to force said cross head to said abutment means when said discharge tube is rotated in valve-opening direction, said cam means being adapted to hold said cross head solidly against said abutment means when the valve is fully opened, and means for resisting the outward thrust exerted on said discharge tube by said cam means, including an outwardly facing continuous shoulder on said discharge tube, an inwardly facing continuous shoulder on said body, and a packing ring surrounding said discharge tube between and in contact with said continuous shoulders, whereby the outward thrust on said discharge tube when said cam means forces said cross head tightly against said abutment means, serves to tightly clamp said packing ring between said continuous shoulders.

5. A valve comprising a hollow body having a fluid inlet and an open end spaced from said inlet, said body being provided between said inlet and said open end with an internal annular ledge, one side of said ledge being disposed substantially at right angles to the axis of said open end of the body and constituting an annular abutment disposed toward said open end, the other side of said ledge constituting an annular valve seat, a valve co-operable with said valve seat and having a neck extending toward said open end of said body, a cross head on said neck slidably and non-rotatably engaging said body, said cross head being spaced from said annular abutment when the valve is closed, a discharge tube extending rotatably into said body through said open end thereof, said discharge tube being adapted to remain permanently engaged with said body and having means on its outer end adapting it for de-

tachable connection with an extraneous hose coupling, the inner end of said discharge tube being provided with valve opening cams to engage said cross head and force it to said abutment when said discharge tube is rotated, said cams being adapted to hold said cross head solidly against said abutment when the valve is fully opened, and means for resisting the outward thrust exerted by said cams upon said discharge tube, including an outwardly facing continuous shoulder on said discharge tube, an inwardly facing continuous shoulder on said body, and a packing ring surrounding said discharge tube between and in contact with said continuous shoulders, whereby the outward thrust on said discharge tube when said cams force said cross head against said abutment serves to tightly clamp said packing ring between said annular shoulders.

6. A valve comprising a hollow body having a fluid inlet, an annular valve seat, and an open end spaced from and aligned with said seat, a valve within said body co-operable with said seat and having a central neck extending toward said open end of said body, a cross head within said body carried by said neck and having end faces slidably engaged with the side wall of said body, said side wall and cross head having co-acting portions for preventing turning of said cross head circumferentially of said side wall, a discharge tube extending rotatably into said body through said open end thereof, the inner end of said discharge tube being provided with valve opening cams to engage said cross head when said discharge tube is rotated, and means for holding said discharge tube against outward sliding, the inner end of said discharge tube being notched to engage said cross head when the tube is slid inwardly, whereby said tube may temporarily be held against rotation when desired.

PETER RIEDEL. 40