No. 858,805. PATENTED JULY 2, 1907.

L. W. GATES.

TAPPING VALVE.

APPLICATION FILED APR. 18, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

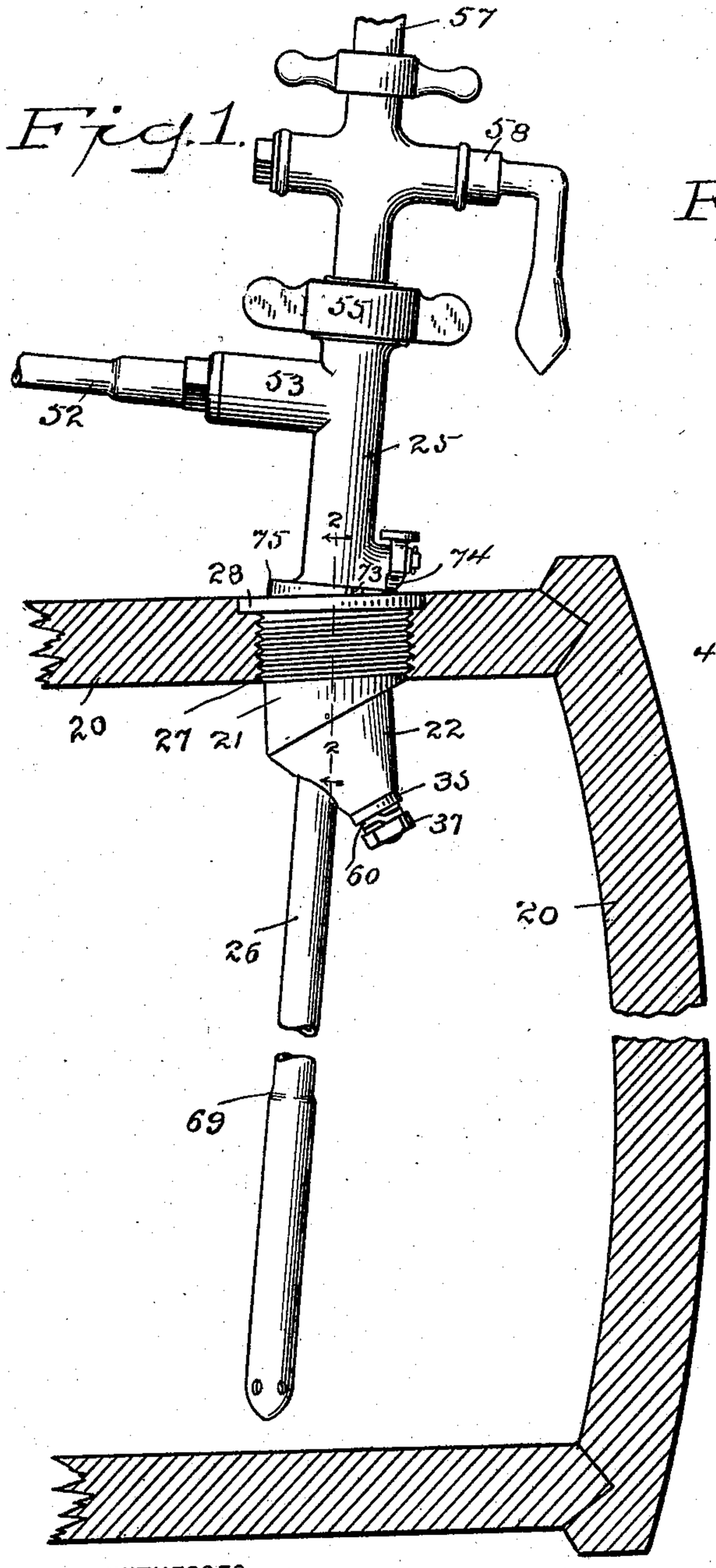


Fig. 2.

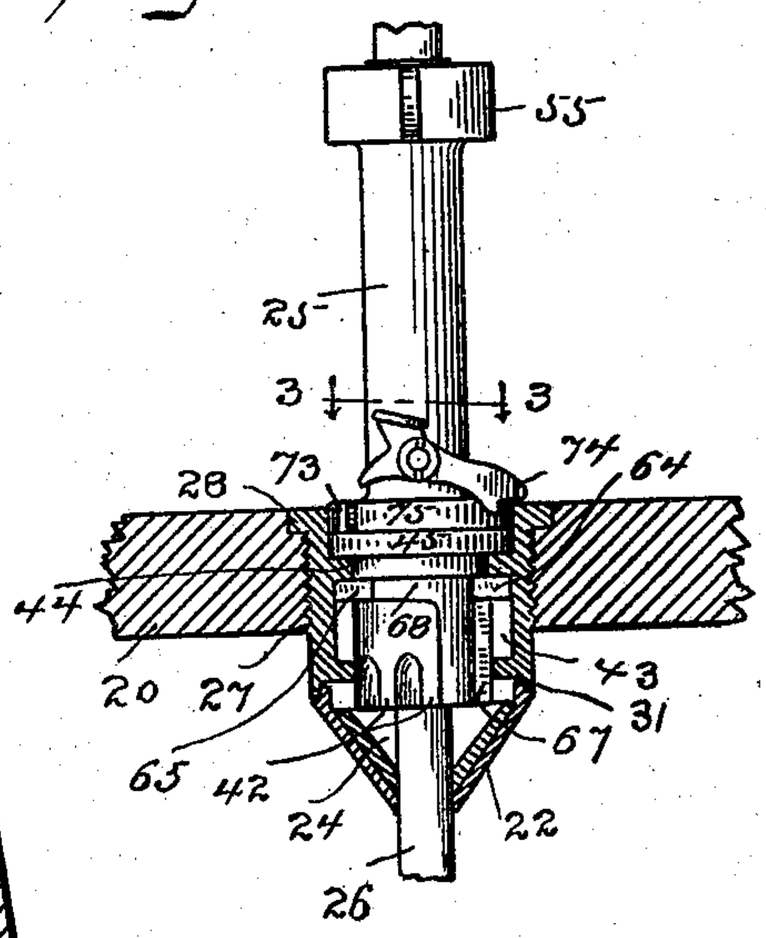
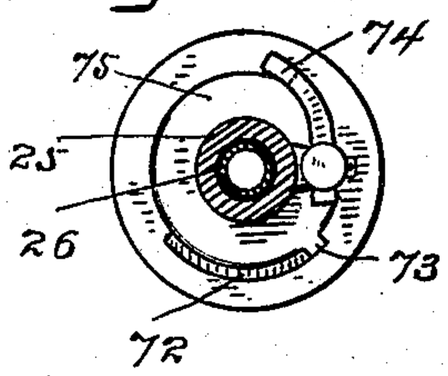


Fig. 3.



WITNESSES

H. A. Lamb.

S. W. Atherton.

INVENTOR

Louis W. Gates

BY

A. M. Wooster

ATTORNEY

No. 858,805. PATENTED JULY 2, 1907.

L. W. GATES.

TAPPING VALVE.

APPLICATION FILED APR. 18, 1906.

2 SHEETS—SHEET 2.

Fig. 4.

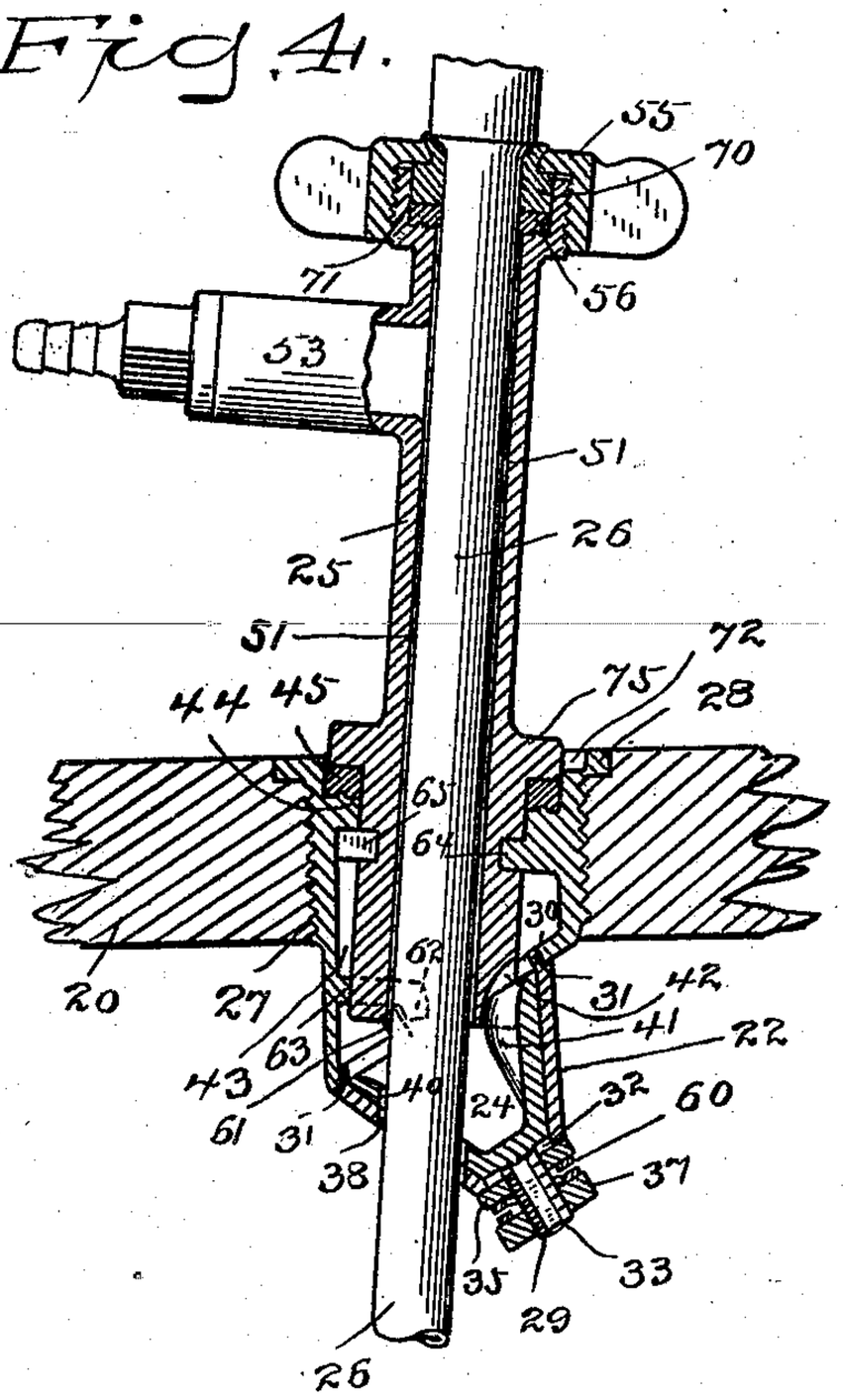


Fig. 5.

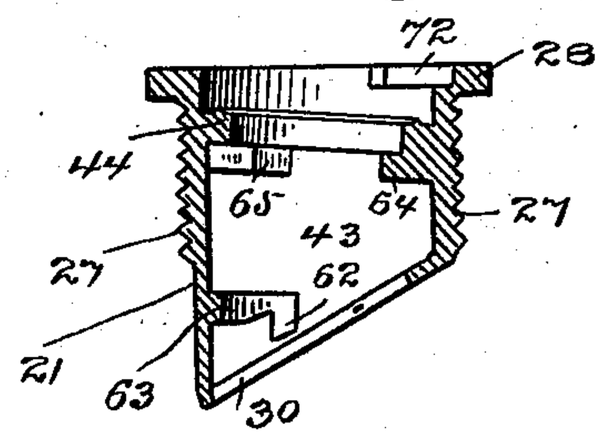


Fig. 6.

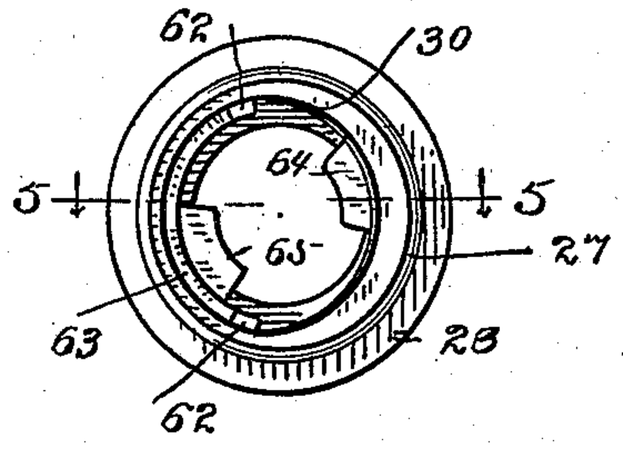


Fig. 9.

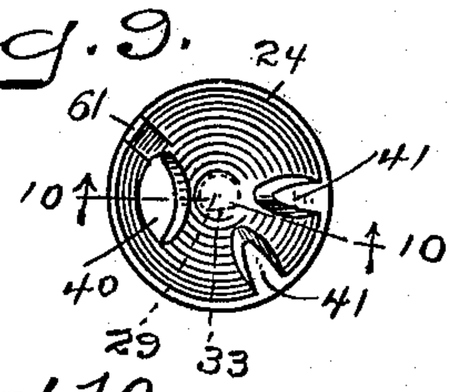


Fig. 7.

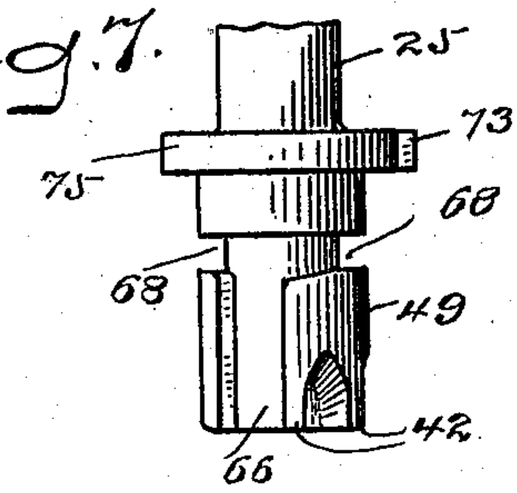


Fig. 10.

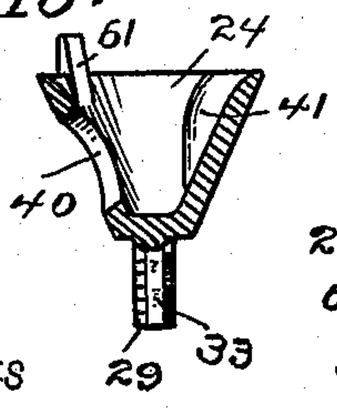


Fig. 11.

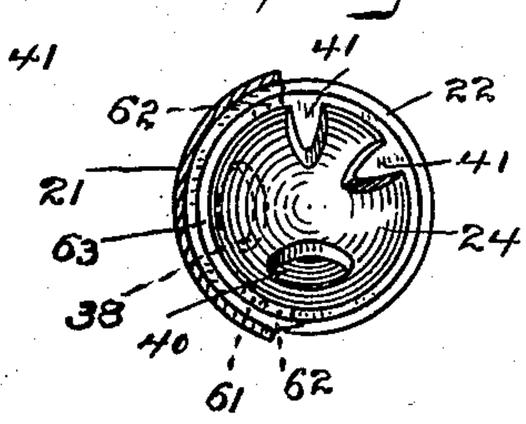
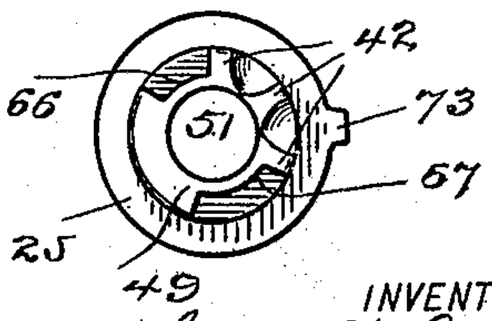


Fig. 8.



WITNESSES

H. A. Lamb.

S. W. Atherton.

INVENTOR

Louis W. Gates

BY

H. M. Wooster

ATTORNEY

UNITED STATES PATENT OFFICE.

LOUIS W. GATES, OF WEST HAVEN, CONNECTICUT, ASSIGNOR OF ONE-HALF TO CHARLES SHOLL, OF NEW HAVEN, CONNECTICUT.

TAPPING-VALVE.

No. 858,805. Specification of Letters Patent. Patented July 2, 1907.

Application filed April 18, 1906. Serial No. 312,382.

To all whom it may concern:

Be it known that I, LOUIS W. GATES, a citizen of the United States, residing at West Haven, county of New Haven, State of Connecticut, have invented a new and useful Tapping-Valve, of which the following is a specification.

This invention relates to the class of valves for drawing beverage from a containing vessel, illustrated and described in my former Letters Patent No. 747,547, dated December 22, 1903, and my present improvements are a carrying forward and perfection of the details of construction of my former invention.

With this end in view the invention consists in certain parts, constructions, combinations and improvements, which will be hereinafter fully described and then specifically pointed out in the claims hereunto appended;

In the accompanying drawings forming a part of this specification, Figure 1 is an elevation of my novel tapping valve, showing its application to a liquid containing vessel which is shown in section; Fig. 2 a section of the shell, valve and valve seat on the line 2—2 in Fig. 1 looking in the direction of the arrows, the key and draft tube appearing in elevation; Fig. 3 a section on the line 3—3 in Fig. 2 looking down, the key having been turned to the closing position; Fig. 4 an enlarged sectional view of the shell, valve and key with the draft tube in elevation; Fig. 5 a section of the shell detached, on the line 5—5 in Fig. 6 looking in the direction of the arrows; Fig. 6 an inverted plan view of the shell detached; Fig. 7 an enlarged detail view of the lower end of the key detached; Fig. 8 an inverted plan view of the key detached; Fig. 9 a plan view of the valve detached; Fig. 10 a section of the valve on the line 10—10 in Fig. 9 looking in the direction of the arrows; and Fig. 11 is a plan view of the valve and valve seat, a portion of the shell being shown in section.

20 denotes a liquid containing vessel, in the present instance a barrel or cask, to which my novel tapping valve is applied, 21 the shell, 22 the valve seat, 24 the valve, 25 the key as a whole and 26 the draft tube. The shell is tubular and is shown as provided with an external screw thread to engage the wood of the barrel and at its outer end with a flange 28 which is countersunk into the head of the barrel, the outer end of the shell lying flush with the head of the barrel. The valve is cone-shaped, is set at an angle to the axis of the shell and operates by rotation. The key engages the shell in a direction oblique to the axis thereof and the draft tube passes through the key longitudinally and through the valve seat and valve obliquely to the axis thereof, as clearly shown in Figs. 1 and 4. This construction enables the shell to be made relatively small, and yet permit the draft tube and valve to be passed through a hole in a barrel that will receive the shell. At the lower end of the shell is a circular opening 30, the wall of which lies in a plane oblique to the axis of the shell. In the present instance, the valve seat is shown as provided with a flange 31 which passes within opening 30, the valve seat in assembling being soldered or otherwise rigidly secured to the shell. Both the valve seat and valve are perfect cones and the exterior of the valve and the interior of the valve seat are ground to correspond with each other. The stem 29 of the valve extends from the apex thereof and passes through a hole 32 in the valve seat. In the present instance, I have shown the valve stem as provided with an angular portion as at 33 (see dotted lines in Fig. 9), which receives a washer 35 having a correspondingly-shaped opening. Outside the washer I place a spring 60 and secure the parts in place by means of a nut 37 which engages the valve stem, the construction insuring a perfectly tight joint but permitting the valve to rotate freely within the valve seat, as will be more fully explained. The valve seat is provided with a hole 38 for the draft tube to pass through and the valve is provided with a corresponding hole 40 so that when said holes are in alinement, as in Fig. 4, the draft tube may be passed freely through them.

Upon the inner face of the valve I provide lugs 41 which are adapted to be engaged by lugs 42 at the lower end of the key. The valve is also provided with an upwardly extending lug 61 which is adapted to engage stop lugs 62 at the ends of a curved rib 63 on the inner side of the shell, which also serves as a bearing for the key. The stop lugs act, through the engagement therewith of lug 61 upon the valve, to limit the oscillation of the valve in either direction, thereby rendering it impossible for the valve to be turned too far and insuring that when the valve is turned to the open position by the key, the holes in the valve and the valve seat will lie in alinement and permit the draft tube to be passed through. In view of the fact that the lug 61 does not move within a confined path and that the lugs 62 extend downward into the path of movement of said lug 61, there is no liability of the formation of an accumulation of dirt and dust on said lugs which would prevent a practically uniform length of movement of the lug 61. And the fact that said lugs are located entirely within the shell prevents any liability of the contents of the barrel affecting such uniform movement.

The shell is provided with an opening 43 through it, with an internal seat 44 and with inwardly extending lugs 64 and 65. Seat 44 lies slightly at an angle to a plane at right angles to the axis of the shell and lugs 64 and 65 lie in a plane parallel with the plane of the

seat. One of these lugs, in the present instance lug 65, is made wider than the other lug and the lower of the two lugs, in the present instance lug 64, projects farther into the central opening than the other. This construction is essential in order that said lugs will, when the key is in proper position (inclined with respect to the axis of the shell and its opening), lie within the circumferential or annular groove formed on said key, the plane of said groove being parallel with the plane of the seat 44.

The head 49 of the key is provided with longitudinal grooves 66 and 67 adapted to just receive the lugs 64 and 65 respectively on the shell, and with a circumferential or annular continuous groove 68 within which the lugs 64 and 65 will ride, as hereinbefore explained, when the key is rotated. The groove 68 being continuous, the presence of dust, dirt, etc., therein, will not affect the movement of the key in a rotary direction, nor tend to limit the movement of the key. Such limiting structure is provided by the lugs 61 and 62, and the lug 73, hereinafter described, as an auxiliary stop or limiting means. Said head is also provided with a flange 75 adapted to register with seat 44, a packing washer 45 being interposed between the flange and the seat.

51 denotes an opening extending longitudinally through the key said opening receiving the draft tube. The diameter of all that part of the draft tube which is intended to enter or pass through the opening in the key, with the exception of the lower end of the draft tube, is slightly less than the diameter of said opening in the key, thereby providing a shoulder 69 near the lower end of the draft tube, the contact of which with the packing washer 56, prevents the draft tube from being withdrawn from the key, as will be hereinafter more fully explained. The reduced diameter of the draft tube permits free passage of air or gas between the key and the draft tube for charging the liquid or for forcing it out through the draft tube. Air or gas for this purpose is admitted through a tube 52 connected to a hub 53 upon the key. It should be noted that while the draft tube passes through the key longitudinally, both the key and the draft tube enter the shell obliquely that is at an angle to the axis of the shell. This is in order to permit the draft tube to be passed through the corresponding openings in the valve and valve seat when the valve is in the open position and also to permit the shell to be made of relatively small diameter, as clearly shown in Fig. 4. It will of course be understood that it is impossible to insert the key into the shell except when the grooves 66 and 67 in the key are in alinement with lugs 64 and 65 respectively on the shell. This insures operative engagement of the lugs 42 on the key with lugs 41 on the valve. After the key has been passed into the shell, lugs 64 and 65 on the shell will register with circular groove 68 in the key into which they pass when the key is rotated. In practice, said lugs and circular groove are so shaped as to have a slight cam action and draw the key downward as it is rotated, which compresses the packing washer between the flange on the key and the seat in the shell and makes a perfectly tight joint between said parts.

The upper end of the key is closed against the escape of liquid, air or gas by means of a screw cap 55, a sleeve 70 and a packing washer 56. The draft tube passes freely through the sleeve and the screw cap turns freely thereon. The screw cap is internally threaded and engages an external thread at the upper end of the key, which is provided with a recess 71 to receive the packing washer. When the draft tube is in place and the screw cap is turned down upon the key, the packing washer is compressed between the end of the sleeve and the base of the recess and makes a perfectly tight joint between the parts. 57 denotes a draft pipe which is connected to the upper end of the draft tube, and 58 a shut-off in the draft tube.

72 denotes a segmental groove in the top of the shell contiguous to opening 43. The ends of this groove are adapted to be engaged by an outwardly extending lug 73 upon the key. 74 denotes a gravity latch which is adapted to engage one end of groove 72 in the shell to lock the key in the open or drawing position; that is, so that the key cannot be oscillated for the purpose of removal until the latch has been operated.

The operation is as follows: When liquid is being drawn from a barrel or other vessel, the lugs 42 on the key are in engagement with lugs 41 on the valve, the holes in the valve and valve seat are in alinement and the draft tube extends through said holes and down into the barrel approximately to the bottom thereof. To withdraw the key, the operator loosens screw cap 55 in order to relieve the pressure on packing washer 56, then raises the draft tube past the valve, the outward movement being stopped by the engagement of shoulder 69 on the tube with packing washer 56, then gives the key a partial turn backward to disengage the key from the shell, and then withdraws the key and the draft tube. It should be noted that the key cannot be turned until the draft tube has been withdrawn past the valve and until the latch has been operated and the key given a partial turn. The movement of the key oscillates the valve and carries the opening in the valve wholly out of alinement with the opening in the valve seat, thus shutting off both the liquid and the air or gas within the vessel that may be used as a pressure medium. As the faces of the valve seat and valve are uniformly ground, the joint is a perfectly tight one and there can be no escape whatever either of liquid or air or gas. It should be noted furthermore that having closed the valve it is impossible to open it without a proper key.

In tapping a barrel, the operator inserts the key and draft tube into the shell, the lugs on the key engaging the lugs on the valve, then turns the key until stopped, which places the opening in the valve in alinement with the opening in the valve seat, then presses the draft tube as far down into the barrel as desired, and then tightens the screw cap at the upper end of the key. The operation of tapping a barrel or other vessel or of removing a key therefrom is in practice performed in less time than it takes to describe it. As already stated, the interlocking lugs on the shell and grooves in the key are so shaped that the key can be passed into the shell in one position only. Stops are provided to limit the oscillation of the key in each direction and also of the valve in each direction so that there can be no possibility of any displacement of the parts in use, the movement of the valve being stopped at the in-

stant the opening therein is in full alinement with the opening in the valve seat. It follows therefore that the full insertion of the draft tube is perfectly easy when the valve is open and the valve must be effectually closed after the tube is raised before the key and draft tube can be removed.

Having thus described my invention I claim:

1. In a tapping valve, a shell having inwardly extending lugs and also having stops located on its interior, a valve and valve-seat secured below said stops, said valve having a lug to engage either one of said stops, and a key insertible into said shell, said key having an annular or circumferential groove and longitudinally-extending grooves leading thereto for the passage of said lugs on the shell to said circumferential groove, openings being formed in said key, valve and valve-seat for the passage of a draft tube when said openings are in alinement.

2. In a tapping valve, a shell having an opening extending therethrough, said shell having a seat whose plane is angular to a plane at right angles to the axis of the shell-opening, a key having an opposing seat, said latter seat being at a right angle to the axis of the key, whereby said key will be inclined throughout its length relatively to the axis of the shell opening when inserted therein, said key also having an axial opening for the passage of a draft tube, interlocking means carried by the shell and key for engaging them during a rotatory movement, a valve seat, and a valve having means whereby it may be rotated by the key.

3. In a tapping valve, the combination with a shell having an opening through it, a segmental groove 72 contiguous to said opening, and on its inner side lugs 64 and 65, a conical valve seat secured to the shell and a rotary conical valve lying within the valve seat and having lugs 41, of a key having a head provided with grooves which receive the lugs on the shell, a circular groove into which said lugs pass when the key is rotated, lugs engaging the lugs on the valve and a lug extending into said segmental groove and adapted to engage either of the ends thereof, substantially as described, for the purposes set forth.

4. In a tapping valve, the combination with a shell having an opening through it, a segmental groove contiguous to said opening and lugs on the inner side of said shell, of a key provided with longitudinal grooves which receive the lugs on the shell, a circumferential groove into which said lugs pass when the key is turned, a lug extending into said segmental groove and adapted to engage either end thereof, to determine the movement of the key in either direction and a gravity latch pivoted to the key and adapted to engage one end of said segmental groove to lock the key in the open position.

5. In a tapping valve, the combination with a shell having an opening through it, a seat lying at an angle to a a plane at right angles to the axis of said opening, and lugs 64 and 65 in a plane parallel with the seat, one of said lugs projecting farther into the shell-opening than the other lug, of a key which enters the opening in the shell obliquely and engages the seat and the lugs, a valve and means whereby it may be rotated by said key, and a draft tube which passes through the key longitudinally.

6. In a tapping valve, the combination with a shell having an opening through it, a seat lying at an angle to a plane at right angles to the axis of said opening, and lugs extending into the opening in a plane parallel with the seat, the lower lug projecting farther into said opening than the upper lug, of a key which enters the shell obliquely and is provided with a flange which registers with the seat and with grooves which receive the lugs on the shell, and a valve and means whereby it may be rotated by said key.

In testimony whereof I affix my signature, in presence of two witnesses.

LOUIS W. GATES.

Witnesses:
OLIVER F. ROBBINS,
JOHN V. WRIGHT.