M. WARREN.

VALVE.

APPLICATION FILED SEPT. 22, 1906.

916,642. Patented Mar. 30, 1909.

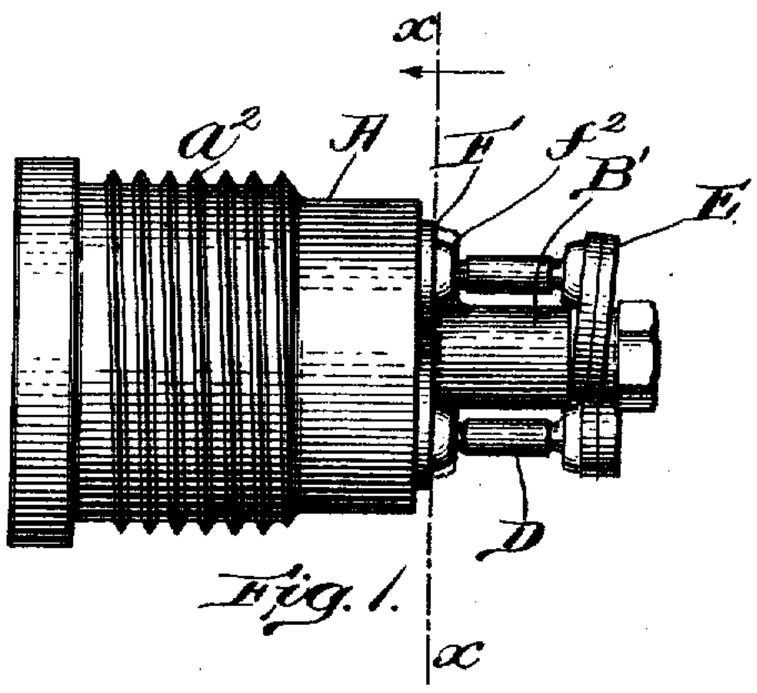

Fig. 1.

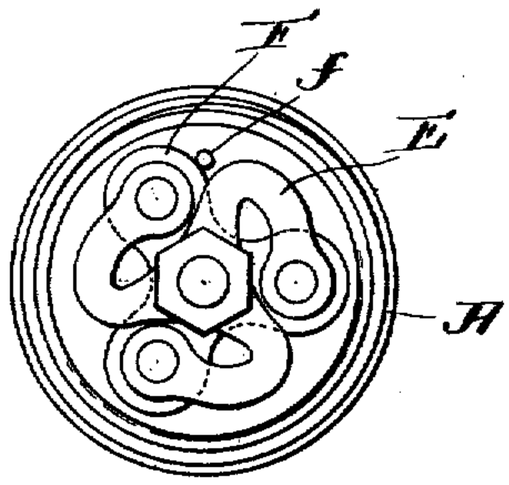

Fig. 2.

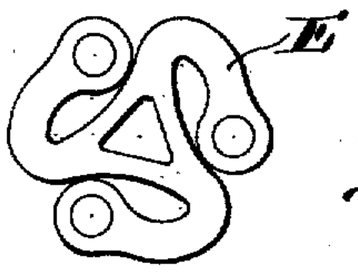

Fig. 3.

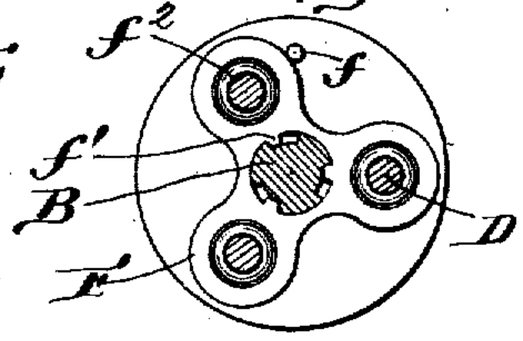

Fig. 4.

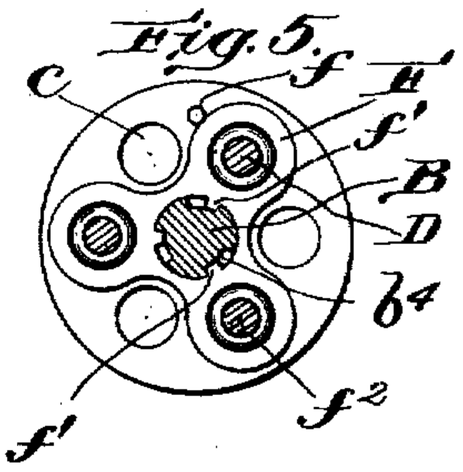

Fig. 5.

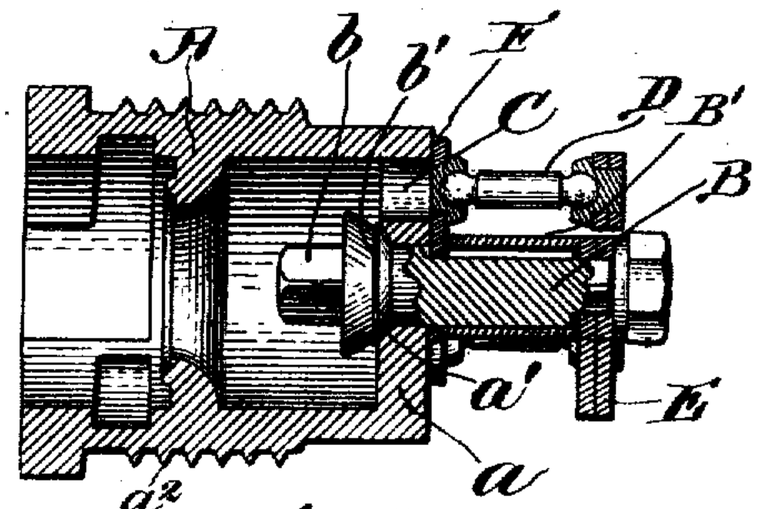

Fig. 6.

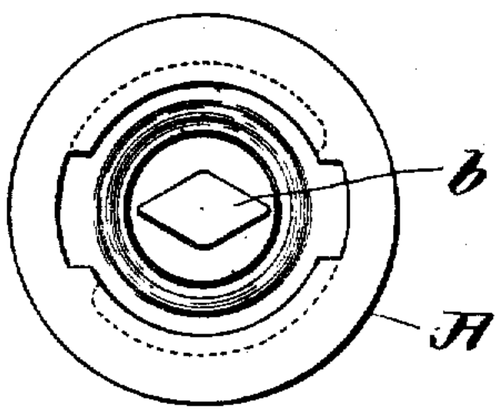

Fig. 7.

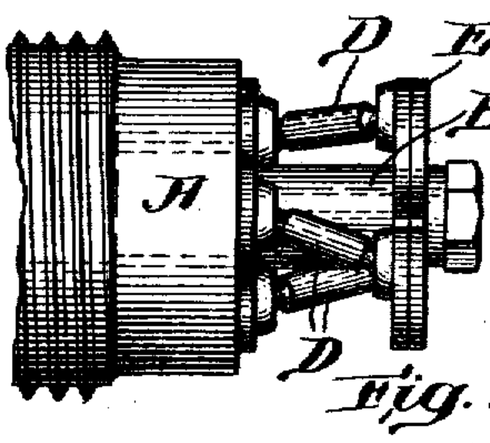

Fig. 10.

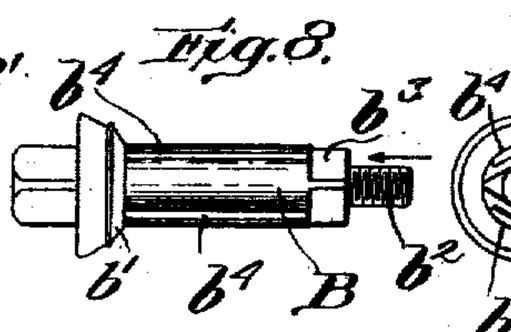

Fig. 8.

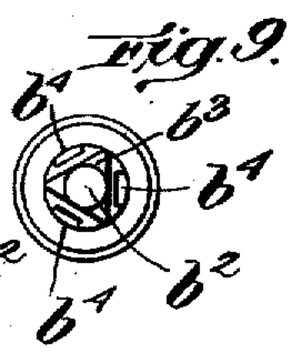

Fig. 9.

Witnesses:
Caspar Rogers
Joseph T. Brennan.

Inventor:
Marion Warren
by Roberts & Mitchell,
his Attorneys.

UNITED STATES PATENT OFFICE.

MARION WARREN, OF ROCHESTER, NEW YORK.

VALVE.

No. 916,642. Specification of Letters Patent. Patented March 30, 1909.

Application filed September 22, 1906. Serial No. 335,681.

To all whom it may concern:

Be it known that I, MARION WARREN, a citizen of the United States, and resident of Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Valves, of which the following is a specification.

My invention has for its object to provide an improved valve and I have shown it as applied for use with brewers' kegs, casks or the like, but as will be clear, its use is not necessarily so limited.

In the accompanying drawings,—Figure 1 is a side elevation; Fig. 2 an end elevation of Fig. 1 taken in the direction of the arrow; Fig. 3 is a detail of the spring carrier; Figs. 4 and 5 are sections on line *x*—*x* of Fig. 1; Fig. 6 is a longitudinal, central section; Fig. 7 is a plan view of the end opposite to that shown in Fig. 2; Fig. 8 is an elevation of the stem; and Fig. 9 a plan view of the stem looking in the direction of the arrow, Fig. 8; Fig. 10 is an elevation of the gate, spring carriers and toggle members, showing the position of the toggle members when the gate is open.

In the embodiment of my invention shown in the accompanying drawings, the valve body is a hollow shell exteriorly threaded as usual and closed at its inner end by a wall through which extends the valve stem. As herein shown three ports are provided through this end wall equally spaced around the valve stem and the inner end of the valve stem, *i. e.* that end of the stem which is within the package when the valve is in use projects beyond the interior wall and is provided with a yielding spring carrier firmly secured to the inner end of the stem so that it must perforce turn with the stem when the stem is turned, and to this yielding carrier are pivotally connected the ends of three toggle members which are pivotally connected at their lower ends to a revoluble gate valve centered upon the stem. It is the function of these toggle members to rotate the gate valve when the stem is rotated until the gate is stopped in its rotation by a fixed point, and the movement of the valve stem being continued, the toggle members are forced to a perpendicular position distorting the spring carrier and causing the spring carrier to force in a vertical direction the toggle members and thus firmly seat the gate valve which, until so seated under spring pressure, turns with only trifling frictional contact upon the end wall of the valve body. In all other gate valves, so far as I know, the gate moves under a constant pressure at all times.

Having reference to the drawings, A represents the body of my improved valve, B the rotatable valve stem journaled in the inner end wall *a* of said body, B is a sleeve, loosely surrounding the stem B, C the ports through the body, D the toggle members connecting the spring carrier E with the gate valve F.

The body A is a hollow shell exteriorly threaded as at a^2 to adapt it to be screwed into the usual opening provided in the head and stave of the cask. One end *b* of the valve stem is angular in cross section and fitted to be engaged by the end of a socket faucet wrench to turn the valve stem and open the ports and thus permit the liquid within the package to escape through the faucet wrench as is customary.

The stem B is provided with a tapered valve b' at its inner end engaging a corresponding tapered valve seat a' in the inner end wall *a* of the valve body to prevent the escape of fluid through the valve stem aperture in the inner end wall *a* of the valve body. The stem proper (see Figs. 8 and 9) is formed at its extreme end, which projects into the package, with a threaded portion b^2 below which is an angular portion b^3 adapted to receive the spring carrier (see Fig. 3) which has an angular perforation adapted to fit upon the angular portion of the stem, so that the stem in its rotation will rotate the spring carrier. Below this angular portion is a cylindrical portion upon which the gate of the valve fits, the gate having a perforation (see Figs. 4 and 5) of suitable size to receive this cylindrical portion of the valve stem, and projections f' projecting within the circle of the perforation which pass into three slots b^4 in the stem. In the embodiment of my invention shown in the drawings, the angular portion which receives the spring carrier is triangular in cross sectional shape and is formed by cutting down the cylinder of which the valve stem is formed to form three faces, so that the gate, which has a perforation and is suitable to pass over the cylindrical portion of the stem, passes over the angular portion of the stem to the cylindrical portion of the stem. The slots in the cylindrical portion of the stem are formed in those

portions of the cylindrical portion of the stem which coincide with the flat faces of the angular portion of the stem so that the projections in the perforation of the gate pass along the flat faces of the angular portion in the assembling process and into the slots of the cylindrical portion of the stem. The stem at its extreme inner end is turned to a smaller cylinder and threaded, as shown in the drawings, to receive a nut. The slots in the cylindrical portion of the stem are about twice as wide as the projecting part of the gate which projects into the slots so that there is a certain amount of play in the movement of the stem before the sides of the slot engage the projections in the perforation of the gate. The object of this play or lost motion will be hereafter explained.

The movement of rotation of the gate is controlled by a stop *f* fixed upon the inner surface of the wall *a* of the body A. It is obvious that the width of the slots in the valve stem with which the gate is loosely in connection by means of the projections *f'* will permit the valve stem to be rotated through a larger portion of a complete rotation than is possible for the gate itself which is positively stopped by the stop *f* when it has made one-third of a rotation in either direction and has thus covered or uncovered the three ports, which are equally spaced around the circle and the valve stem. Assuming that the gate is in the open position (Figs. 5 and 10) and that the valve stem has been turned as far in the opening direction as it can move, and that the valve stem is stopped in its backward motion by the engagement of one side of each slot with the projection on the gate and the engagement of the gate with the stop *f*, the spring carrier which rotates with the valve stem will have been drawn to such a position that the toggle members, pivotally connected with the gate and with the spring carriers, will be in a slanting position, as shown in Fig. 10. If the valve stem be now moved in the closing direction the motion of the valve stem will be transmitted through the spring carrier to the toggle members and to the gate and the slanting toggle members will push the gate until it engages the stop. The gate will then cease to yield to the push of the toggle members and the rotation of the stem being continued, the toggle members will pivot in the cup f^2 in which they are secured upon the gate, and they will be forced into a perpendicular position distorting the respective spring carriers to which they are pivotally connected as shown in Fig. 1, and this process will continue until the toggle members are in a perpendicular position, when the other edge of the slot will engage the projection upon the gate and stop the further rotation of the valve stem which would, if continued, throw the toggle members over the dead center, which is undesirable. It will be observed that the turning of the valve stem until it is stopped by the engagement of the side of the slot with the projection upon the gate, connotes that the side of the slot upon the other side has moved away from the projection. In reversing the movement just described, the first motion of the valve stem will release the spring pressure, and if continued would tend to release the toggle members from their cup and ball engagement with the gate and spring carrier respectively, but as soon as the toggle members are thrown from the perpendicular position, the other side of the slot in the valve stem will engage the projection upon the gate and will turn the gate as rapidly as the valve stem turns and thus maintain the proper relative position of the spring carrier with the gate so that the toggle members when not perpendicular and under spring pressure are carried loosely between the spring carriers and the gate but not in such a fashion that they can be released.

I claim:

1. In a valve, the combination of the body A, having a port or ports and an annular perforation; a valve stem B passing through that perforation and carrying at one end a spring carrier E; that spring carrier E; a gate valve F mounted to coöperate with the port in the body A; toggle member D connecting the spring carrier and the gate valve all organized so that rotation of the valve stem will actuate the gate valve through the spring carrier and toggle member to close or open the ports in the body A, substantially as described.

2. In a valve, the combination of the body A, having a port or ports and an annular perforation surrounded by a valve seat *a'*; valve stem B passing through said perforation and carrying a valve *b'* coöperating with the valve seat *a'*; a spring carrier E mounted upon the stem B; a gate valve F mounted to coöperate with the port of the body A, toggle member D connecting the spring carrier and the gate valve, substantially as described.

Signed by me at Rochester, New York, this nineteenth day of September, 1906.

MARION WARREN.

Witnesses:
ROY C. WEBSTER,
HENRY V. WOODWARD.