M. L. WOODS.

VALVE.

APPLICATION FILED JAN. 2, 1917.

1,288,356.

Patented Dec. 17, 1918.

2 SHEETS—SHEET 1.

Fig. 2.

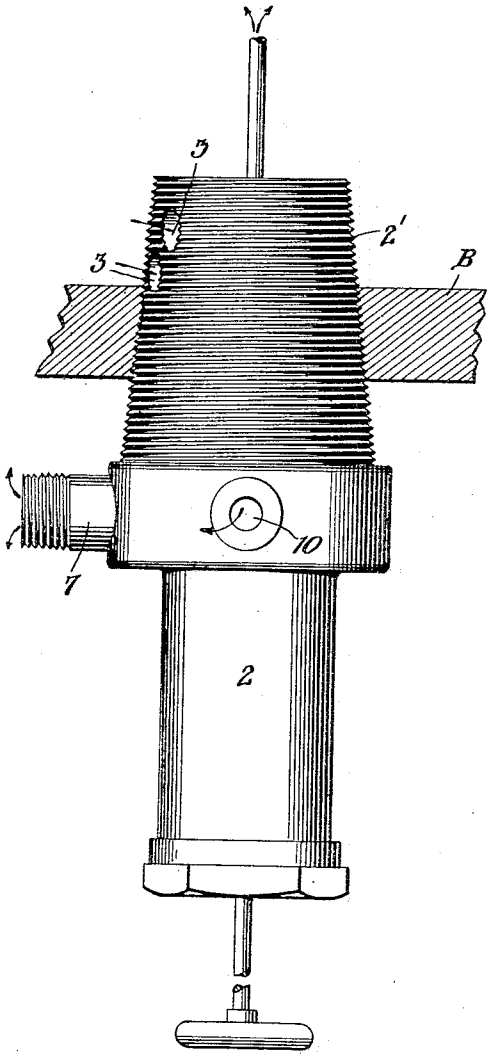
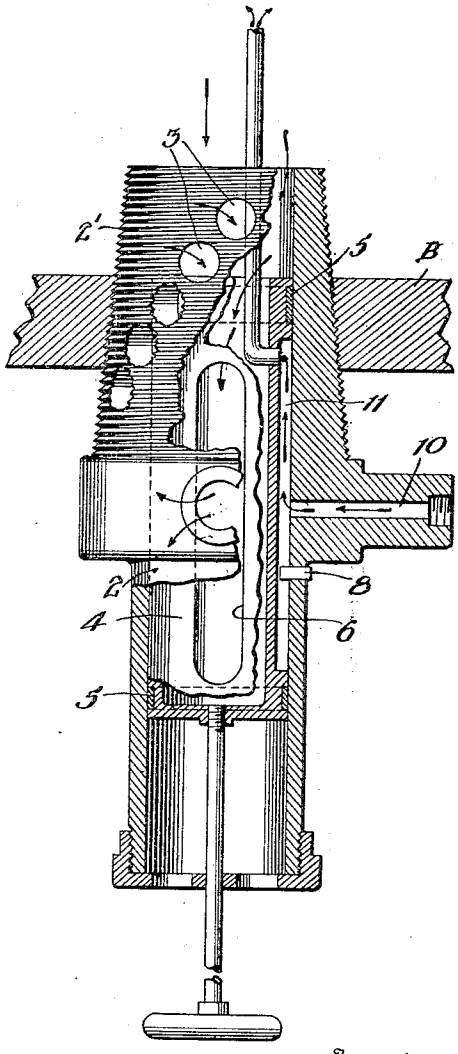


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 3.

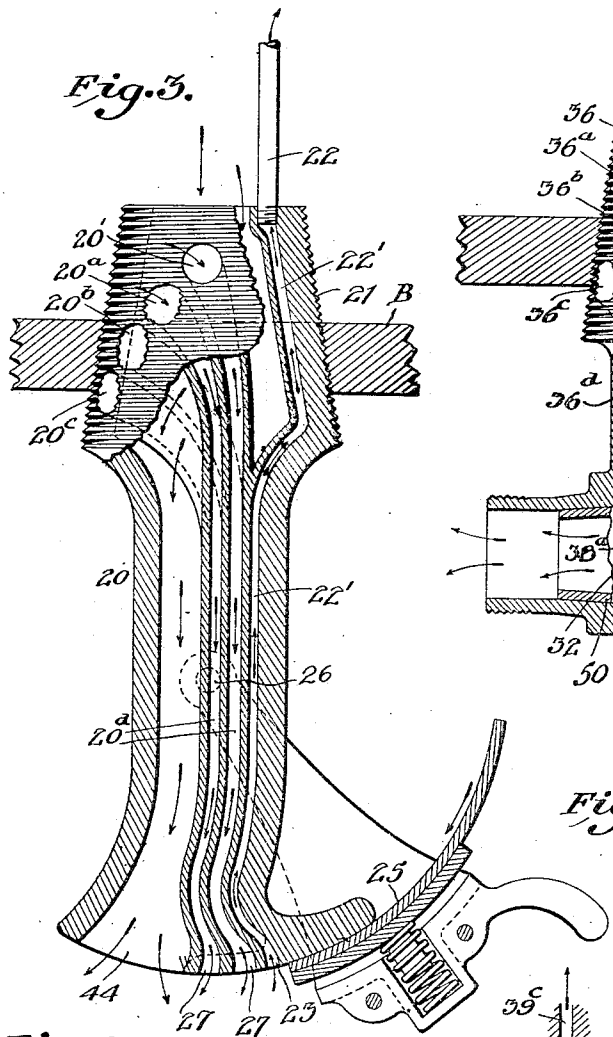


Fig. 4.

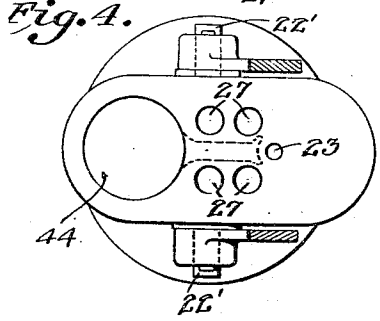


Fig. 5.

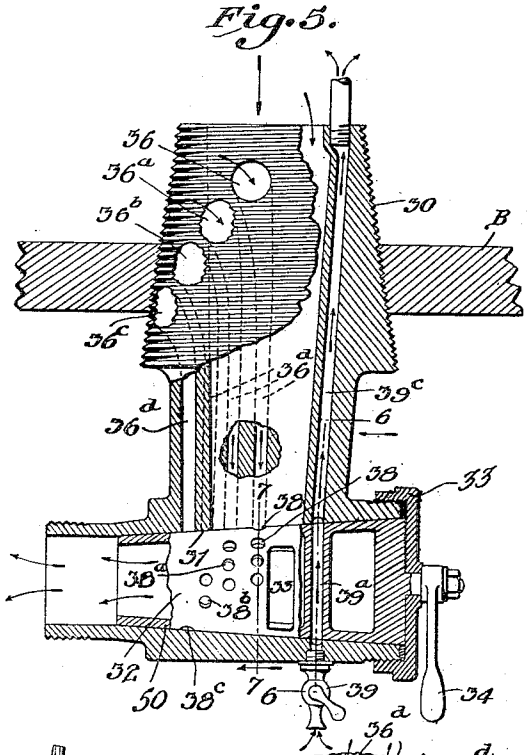


Fig. 7.

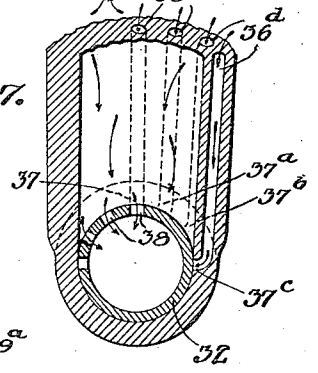
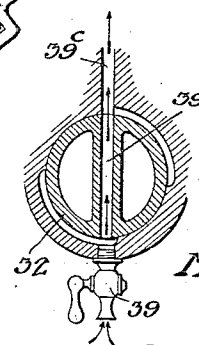


Fig. 6.



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VALVE.

1,288,356. Specification of Letters Patent. Patented Dec. 17, 1918.

Application filed January 2, 1917. Serial No. 140,201.

To all whom it may concern:

Be it known that I, MARK L. WOODS, a citizen of the United States, residing at Chattanooga, in the county of Hamilton and State of Tennessee, have invented certain new and useful Improvements in Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to valves, and more particularly to a type of valve adapted to be attached to containers, and it is an object of the present invention to provide for the ready emptying of the container to which the valve may be applied or is attached, and to insure the complete emptying of the barrel or other container by providing means for the outlet of all the material from the lowermost portion of the container.

And it is a further object of the present invention to provide for the inlet of air to replace the withdrawn content while the valve is open and the container is being exhausted, either by the force of gravity or under pressure in the container.

The present invention relates particularly to a type of valve which may be readily attached to various containers such, for instance, as kegs, barrels and other vessels which may have at some portion an opening, for instance a bung-hole or the like, to which the valve may be readily attached and frequently, as these openings or bung-holes are of various diameters and also as the thickness of the walls of the containers frequently vary, it has heretofore not been possible to readily and quickly withdraw all of the contents from such containers for the reason that the inner end of the valve would project upwardly into the container to such a length as to prevent the outflow of the residue material in the bottom portion of the container through the valve duct and outlet.

This invention has in view the provision of a valve structure of such design and construction that it may be readily fitted to containers such as barrels, kegs, etc., having previously formed apertures such as bung-holes, the valve being provided with a surface adapted to snugly fit these apertures of various diameters, and which valve is provided with a series of ports or ducts opening through its side wall or casing so that in any position in which the valve body may project through the container wall or barrel stave, for instance, one of the ducts or passages would register with the bottom surface of the container so that the entire contents could be ultimately drawn from the container through the open valve. To facilitate the rapidity of withdrawal of the contents from the barrel, a suitable vent means also is provided which permits the air to flow naturally into the tank or keg or other container to which the valve may be applied, and thus replace the discharging liquid, and also the vent may be utilized as a means through which pressure may be introduced into the interior of the container to force the liquid outwardly under pressure.

In some installations, especially in bottling works, it is the common practice to exhaust or discharge the liquid from a tank, keg or barrel into another receptacle from which it is transmitted directly to a bottling machine and bottles are filled therein. By my present invention the keg, barrel or other container of the liquid to be withdrawn may be connected directly to the bottling apparatus through means of the present valve, and the contents discharged directly from the barrel or keg, etc., to the bottles being filled in the bottling apparatus.

Broadly the invention consists of a valve designed to provide for the complete drainage of all of the liquid content from a vessel, such for instance as a barrel, keg, etc., irrespective of the thickness of the wall of the container and consists of a valve having a body portion of such proportions that it may be applied to containers to project into the same to various depths as determined by the thickness of the wall, and also by the diameter of the opening in the container to which the valve may be attached. In addition to the feature providing for the entire withdrawal of the contents of the container, the valve also embodies a vent means providing for the introduction of air either under natural pressure or under compression to replace the liquid as it is discharged from the container.

With these and other objects in view the present invention consists of a valve structure comprising means for draining the tank of all of its content, and further consists of a valve having in combination means for draining and for venting a tank, and also

comprises a swinging gate valve having means for venting the tank to be drained. In the following specification and the accompanying drawings the invention is shown as embodied in a variety of forms of valves in which:

Figure 1 is a central longitudinal section of a valve in which the invention is embodied in a sliding valve plug.

Fig. 2 is a side elevation of the valve.

Fig. 3 is a central longitudinal section through a modified form of a valve embodying the invention when adapted in a swinging gate valve, and

Fig. 4 is an underneath or bottom plan view of the discharge end of the valve.

Fig. 5 is a central longitudinal sectional view of an embodiment of the invention in which the valve plug is arranged at right angles to the axis of the valve casing and threaded body part.

Fig. 6 is a detailed sectional view taken on line 6—6 of Fig. 5.

Fig. 7 is a section on line 7—7 of Fig. 5.

In an embodiment of the invention shown in Fig. 1, a valve casing 2 is provided with a tapering threaded exterior 2′ and with a longitudinal, spirally arranged series of drain apertures 3 opening into the interior of the valve casing, and for the purpose of controlling the flow of the liquid out through these drain ports 3 when the valve casing 2 has been applied to a container such as a keg, in this embodiment there is provided a piston 4 having packing rings 5 at its ends snugly engaging the interior wall of the casing 2, the piston having a longitudinal port, at 6, providing for the escape of the liquid from the interior of the piston 4 which is hollow to an outlet 7 formed conveniently upon one portion of the casing 2 and to which may be attached a suitable conductor for leading the contents discharged from the keg or other container to any suitable point. The lower end of the hollow piston or valve plug 4 is provided with a stem whereby it may be shifted to a suitable position within the hollow valve casing 2 so as to cover all of the apertures 3 which may be exposed outside of the container or barrel B, and thereby prevent the discharge of liquid as it flows through the valve outwardly therefrom. The elongated port 6 in the side of the piston provides for communication between the outlet port 7 of the valve casing and the inner chamber of the hollow piston during any position of the piston or plug within the valve casing. The piston may be prevented from turning out of register with port 7 by any suitable stop as pin 8.

To provide for the venting or admission of air under pressure to the container when the piston is moved to open outlet 7, I provide an air inlet connection 10 which leads to a duct 11 in one side of the piston 4. This duct may be continued upward by a tube if desired.

My present invention may also be readily incorporated in a valve of the swinging gate type, such for instance as is illustrated in Fig. 3 in which there is provided a valve casing or body 20 having at one end a conical externally threaded portion 21 adapted to be fitted into bung or other holes of various diameters in different tanks or containers. In this form the vent pipe 22 is connected at the inner end 21 of the valve and communicates with a duct 22′, which may be cored in the valve body or may be formed by continuing the tube 22 downwardly along the inside of the valve casing to a terminating air inlet port 23 which is shown as disposed in the arcuate lower discharge end 44 of the valve over which there is adapted to move a yielding gate 25 which is shown pivoted, in the present instance, at 26, to the valve body so as to be moved to a closing position over the lower end of the valve or to an open position, as shown in Fig. 3, to uncover the central discharge passage of the body and the air vent port 23. To provide for the complete drainage of the container to which the valve may be applied, its upper end 21 is provided with a series of drain apertures 20′, 20^a, 20^b and 20^c arranged in suitable relation with their successive, adjacent edges substantially in the same plane so that, irrespective of the inward projection of the valve end 21 into the interior of the container, one or a plurality of the drainage apertures will be uncovered to insure the complete drainage of the liquid from the bottom inner surface of the tank. In this embodiment of the invention the drainage apertures are shown as in communication with respective cored ducts 20^d leading from the upper end of the valve 21 downwardly through the valve casing to and discharging at outlets 27 in the lower curved end of the valve. It will be seen that by providing for the discharge of the drain ports 20′, 20^a, or 20^b, or 20^c independently and continuously through their respective ducts 20^d to the lower outlet openings 27 of each that it will be impossible for material flowing through the center of the valve casing to discharge through any of the drain ports which may happen to be exposed, as at 20^c in Fig. 3, owing to the position of the valve casing when it is applied to the wall of the container which is to be drained. While the drain ports 20′, 20^a, etc., are shown as communicating with cored ducts 20^d made in the body of the valve casing, it is possible that the ports may be connected to their outlets 27 through means of tubes which may be joined at the inner ends of the drain ports 20′, 20^a, etc., at one end of the valve, and the lower ends of the tubes may be connected

to the waste ports 27 at the lower curved ends of the valves, though it is preferred that the ducts 20[d] be cored in the valve casing as above described.

A further embodiment of the invention is shown in Figs. 5 and 6 in which the valve casing is provided at one end with a conically threaded portion 30, and at its opposite end it having a valve seat 31 which is disposed at substantially right angles to the axis of the conical end, and receives a conical hollow valve plug 32 having a port 33 arranged circumferentially at about its midlength adapted to be brought into discharging registry with the main outlet of the valve casing 30. The outer end of the valve plug 32 projects beyond the seat 31 and carries a handle 34 by which the plug may be turned, although any other suitable devices may be employed if desired. The valve plug 32 may be held snugly to its seat and against outward movement thereon by means of a suitable yoke or gland 35 passed over the upper end of the valve and engaging a flanged portion of the valve seat. In this form of the invention drainage from the bottom of a container to which the valve may be applied is obtained through a series of drainage outlets, 36, 36[a], 36[b] and 36[c] disposed so that adjacent edges of the successive ports are substantially in common planes so as to insure that one or more of the series of the ports will be exposed to the interior of the vessel to which the valve may be applied according to the thickness of the structure and the diameter of the aperture therein in which the tapering valve end 30 is inserted. Drainage entering the drain ports 36, etc., passes downwardly through drain ducts 36[d] which may be cored within the body of the valve casing or otherwise made and which terminate respectively at ports 37, 37[a], 37[b] and 37[c] in the valve seat, and with which are adapted to be brought into registry, respective ports 38, 38[a], 38[b] and 38[c] formed in the rotative valve plug 32. The venting of the container to which the valve may be applied is provided in the form shown in Figs. 6 and 5 by an air vent cock 39 which is attached to a suitable portion of the valve seat and communicates, through an air passage 39[a] in the plug, with the inner end of a vent duct 39[c] extending through the valve body or casing, and which may be extended into the interior of the casing, as by means of a vent tube.

From the foregoing it will be seen that I have provided a very simple form of valve in which means are provided for the rapid and complete draining of the entire contents of a container, such for instance as a barrel, keg, etc., to which the valve body may be readily applied or attached, and that when it is necessary to control the drainage of the liquid through any of the drainage apertures means are provided to cover such of these apertures as may be exposed from the low or outside of the tank because of the longitudinal position the valve may assume when applied to one of tanks having apertures of different diameters and by reason of which the projection of the valve body into the container may be various. Also, I have provided means for venting the tank to permit more ready discharge of the contents therefrom without necessitating the opening or venting of the tank at some other point or location when this is a sealed vessel. It is to be understood that as many of these drain apertures may be arranged longitudinally of the valve body as may be desired or expedient, as it is possible to make the valve casing where it fits the container of any suitable length, and therefore as many of the drainage apertures as desired may be located with their edges successively in juxtaposition to each other, or, in other words, with their edges successively arranged in common planes so as to form substantially a continuous longitudinal outlet opening, one or another portion of which may be exposed within the container to which the valve may be applied.

What I claim as new is:

1. A faucet, insertible in container walls to various distances and adapted to fit various sized tap openings therein, having a valve body provided with a series of independent drain ports in its wall stepped progressively longitudinally of the valve body, and a valve closure for controlling discharge through any of said ports exposed outside the wall.

2. A valve attachable to a container and adapted to project various distances therein and having a valve body provided with a series of independent drain ports in its wall stepped progressively longitudinally of the valve body, the longitudinally adjacent edges of successive ports substantially intersecting common planes and a valve closure controlling discharge through said ports, said body having a tap end adapted for insertion into various sized openings in containers.

3. A faucet for fully draining a container to which it is attached, comprising a tap-end having a longitudinal series of drain ports in its wall, and means for controlling the flow of fluid through said ports, said tap end being tapered and adapted for insertion into various sized openings in containers.

4. A faucet for fully draining a container to which it is attached, comprising a tubular tap end having a longitudinal series of drain ports in its wall, and means for controlling the flow of fluid through said ports, said tap end being tapered and adapted for

insertion into various sized openings in containers.

5. A drain valve attachable to containers having openings of various sizes and adapted to project various distances therein, said valve having a series of drains for fully withdrawing the content therefrom irrespective of the position of the valve in the container wall to which it is attached, and means for controlling flow through said drains.

6. A drain valve comprising a casing having a tap adapted for insertion into various sized openings in containers to project therein various distances and provided with independent drains for draining the container irrespective of the projection of the valve end, and means for closing such drains as may be exposed outside the container wall without closing the drains within the container.

7. A drain valve comprising a casing having a tap adapted for insertion into various sized openings in containers to project therein various distances and provided with independent drains for draining the container irrespective of the projection of the casing end, and means for closing such drains as may be exposed outside the container wall without closing the drains within the container, and for permitting air to flow into the container when the valve is open to discharge the content of the container.

8. A drain valve having a casing provided with a series of drain ducts opening at successive mouths longitudinally pitched along the casing end and providing for the draining of the lowermost portion of a container, air-inlet means, and a valve closure controlling flow through said drains.

9. A drain faucet having a tapering tap-end adaptable for connection to containers having variously sized apertures, and having means providing for the complete draining of a container to which it is attached.

10. A faucet having a threaded tap end adaptable for connection to containers having variously sized apertures provided with drains for the complete draining of a container to which it is attached, and having means for the inlet of air to the container.

In testimony whereof I affix my signature.

MARK L. WOODS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents Washington, D. C."