M. MAURAN.

CHARGING VALVE FOR FLUID HOLDING RECEPTACLES.

APPLICATION FILED APR. 8, 1911.

1,100,439. Patented June 16, 1914.

Fig. 1.

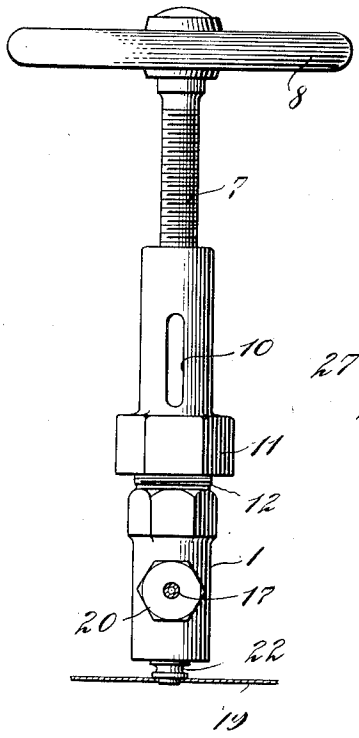


Fig. 2.

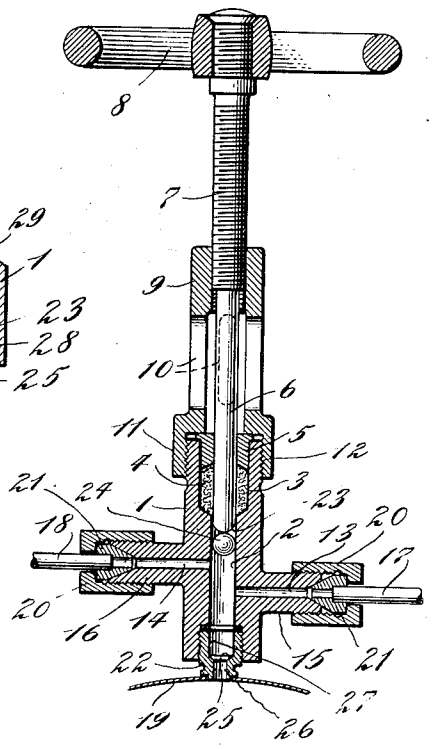


Fig. 4.

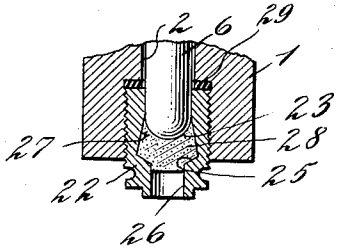
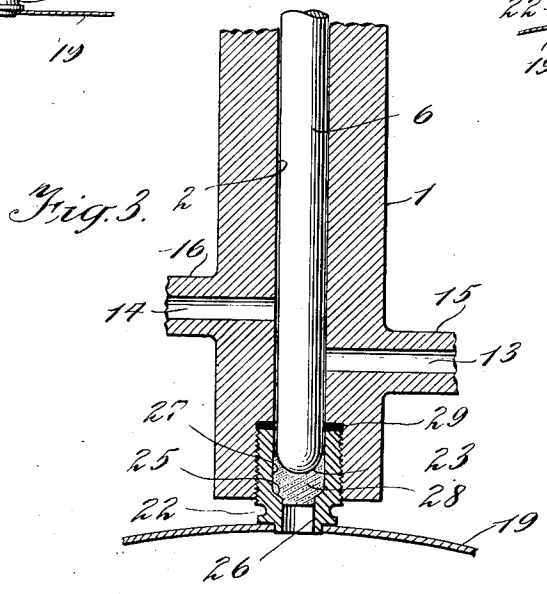


Fig. 3.



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UNITED STATES PATENT OFFICE.

MAX MAURAN, OF NIAGARA FALLS, NEW YORK, ASSIGNOR TO CASTNER ELECTROLYTIC ALKALI CO., A CORPORATION OF VIRGINIA.

CHARGING-VALVE FOR FLUID-HOLDING RECEPTACLES.

1,100,439. Specification of Letters Patent. Patented June 16, 1914.

Application filed April 8, 1911. Serial No. 619,712.

To all whom it may concern:

Be it known that I, MAX MAURAN, a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Charging-Valves for Fluid-Holding Receptacles, of which the following is a full, clear, and exact description.

This invention relates to means for sealing the vents of receptacles and more especially to a means of the type in question which involves apparatus adapted to deform sealing material by pressure whereby to securely plug the vents of high pressure receptacles. The efficient and economical filling and closure of receptacles which are adapted to withstand relatively high pressures and which are frequently filled with chemically active liquids or gases has heretofore presented in practice difficulties which it is the purpose of this invention to overcome.

In my co-pending application Serial No. 619,711 filed of even date herewith, I disclose means for breaking the seals formed by the apparatus herein described, and, further, means for dispensing fluids from the receptacle as needed and substantially without waste.

The present application however will be confined to the sealing medium and apparatus for forming the same.

The object just mentioned, and others of my invention will be hereinafter set forth and more particularly referred to in the appended claim.

I am aware that various modifications of the means and apparatus to which this application relates may be made without departing from the spirit of my invention and I hence desire to be limited only by the scope of the said appended claim.

In the drawings which form a part hereof: Figure 1 is an elevation of a preferred form of apparatus. Fig. 2 is a longitudinal axial section of said apparatus. Fig. 3 is a fragmentary section showing the action of a plunger, used in said apparatus, upon the deformable sealing body or mass. Fig. 4 is a longitudinal section of a slightly modified form of the receptacle coupling, with a formed seal in position therein.

Referring to the drawings in which like reference characters designate like parts throughout the several views; a suitable casing 1 is chambered as at 2, such chamber being preferably circular in cross section. The upper end of the casing is counterbored as at 3 for the reception of suitable packing 4, the latter being held in position by a gland 5 in the usual manner. This packing is disposed around a preferably cylindrical plunger 6 which extends down into the chamber or cavity 2 and practically fills the same when said plunger is in its lowermost position. The upper end of the plunger is threaded as at 7 and has a hand wheel 8 firmly mounted thereupon, by means of which the plunger may be advanced into or retracted from the said chamber; the portion 7 being in threaded engagement with a gland retaining sleeve 9. This sleeve may be slotted as at 10 for ventilation, to protect the threaded parts from any gases which might escape, and to facilitate turning the sleeve; and its lower end is preferably enlarged or headed as at 11, and apertured to receive the upper end of the casing 1, with which it is in threaded engagement. The threaded connection 12, in question, is preferably made left handed to counteract the tendency, otherwise in evidence, of the plunger when being rotated right hand and when therefore entering the cavity or chamber 2, to tighten the packing unnecessarily; and to counteract the possibility of unscrewing sleeve 9 and loosening packing 4 when withdrawing the plunger.

The chamber 2 has, preferably, two ports 13 and 14 leading thereinto, the casing having laterally projecting arms 15 and 16 through which these ports respectively extend. Suitable means are provided in connection with these arms for connecting the said ports with tubes 17 and 18 one of which serves to admit the fluid to the receptacle 19 to which the casing is affixed and the other serving, if desired, to exhaust air or other fluid from said receptacle. The connecting means just referred to, whereby, for example, the tube 17 is connected to the arm 15 consists of a gland 20, preferably of steel or the like, which has a threaded connection with the said arm and which thereby provides means for driving a conical head 21 of brass or other suitable material into the recessed or counter-sunk end of the arm, to effect a tight joint therewith. The head 21 is axially apertured and is preferably se-

cured to the extremity of the tube 17 by being brazed thereto, if the said tube be made of copper or the like.

A coupling or seal receiving part 22 is provided in connection with the receptacle 19, and is preferaby fixedly secured thereto, and threaded exteriorly for connection with the lower end of the casing 1, said end being counterbored and interiorly threaded for that purpose.

The lower or operative extremity of the plunger 6 is preferably rounded as at 23 to better adapt it to deform a body 24 of deformable material with which the vent in the receptacle is plugged or sealed in the manner now to be described.

The foregoing apparatus constitutes a charging valve and is designed to operate as follows: Assuming the receptacle 19 to be empty, a ball or other suitable body 24 of lead or the like is introduced into the chamber 2 and is pushed into the same a sufficient distance to clear the port 14, so that it is disposed substantially as shown in Fig. 1. Now if the tubes 17—18 be respectively connected to the source of the liquid with which the receptacle is to be filled, and with a waste or auxiliary receptacle, then if pressure is applied, the fluid may be passed through the tube 17 to the chamber 2, and from thence down through the coupling 22 into the receptacle, air having been previously withdrawn from the latter through the tube 18. After the receptacle has been filled the flow of fluid through the tube 17 is cut-off in any suitable manner and the hand-wheel is rotated clockwise as viewed from above, thereby driving the ball 24 down toward the seat 25 which is provided in the interior of the coupling 22. The plunger 6 descends with considerable force and distorts or deforms the ball or body 24 until the material thereof assumes substantially the form indicated in Fig. 3, a portion of such material extending into the aperture 26 which extends through the base of the coupling or nipple and which preferably opens centrally of the seat 25, while the remainder of said material is pushed outwardly into intimate contact with the walls of the recess 27 in the upper portion of the said coupling. The plunger may now be withdrawn and the tubes 17 and 18 disconnected with safety and the entire valve may be unscrewed from coupling 22 without danger of leakage of any of the fluid from the receptacle 19, since the latter will be most effectively sealed by the seal 28 formed in the manner above described. In some instances it may be desirable to more or less undercut the wall of the recess 27 in the coupling, as shown in Fig. 4, especially when fluid in the receptacle 19 is under tremendous pressure, although ordinarily the frictional engagement between seal 28 and the wall of recess 27 will be more than sufficient to hold the seal safely in position. While positioning the seal 28, and indeed while filling the receptacle, no leakage of fluid will occur around the plunger by reason of the packing therearound; nor by leakage around the threads of coupling 22, which is prevented by the use of a suitable gasket 29.

My apparatus is particularly adapted for use in connection with such fluids as liquid chlorin, and, of course, the materials of which the respective parts are composed should be adapted for use in connection with the fluid to be filled and sealed in the receptacle. For the seal forming material I find that lead is particularly well adapted, this metal being practically unacted upon by many chemically active fluids, while it possesses the requisite ductility to adapt it to be deformed in the manner above described; while further a seal of this or like material is readily perforable by means of the dispensing apparatus described in the co-pending application aforesaid.

Having described my invention, I claim:

A sealing device for receptacles, consisting of a nipple fixed to the receptacle and having an orifice leading into the same, said orifice being enlarged at its outer end providing an annular shoulder therein, in combination with a structure provided with means for engagement with said nipple and with a plunger of substantially the same diameter as the enlarged portion of said orifice and adapted to enter the same, a deformable sealing plug of a diameter substantially greater than that of the small part of said orifice, said plunger adapted to deform the plug within the enlarged portion of said orifice to thereby seal the orifice and cover said annular shoulder therein, substantially as and for the purpose described.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

MAX MAURAN.

Witnesses:

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JOHN G. GRNTLEMAN.