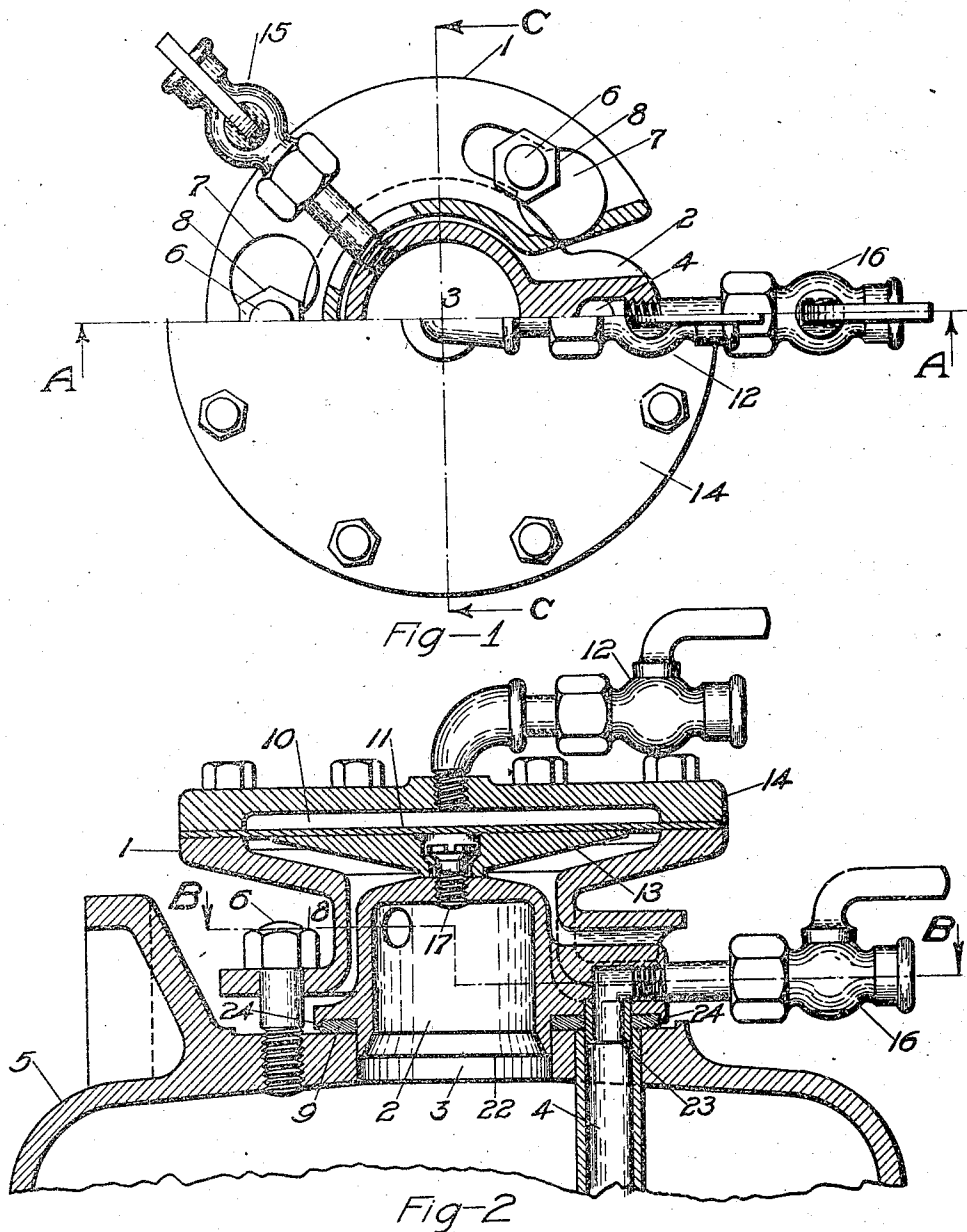


E. E. CHAMBERLAIN.
ORIFICE CLOSER.
APPLICATION FILED MAR. 21, 1916.

1,242,769.

Patented Oct. 9, 1917.
2 SHEETS—SHEET 1.



WITNESSES:

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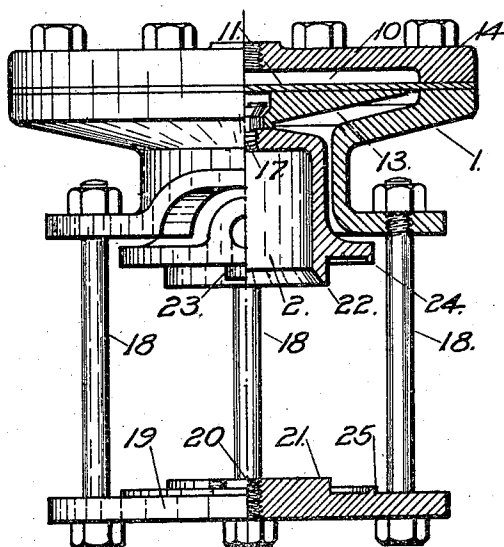


Fig-3

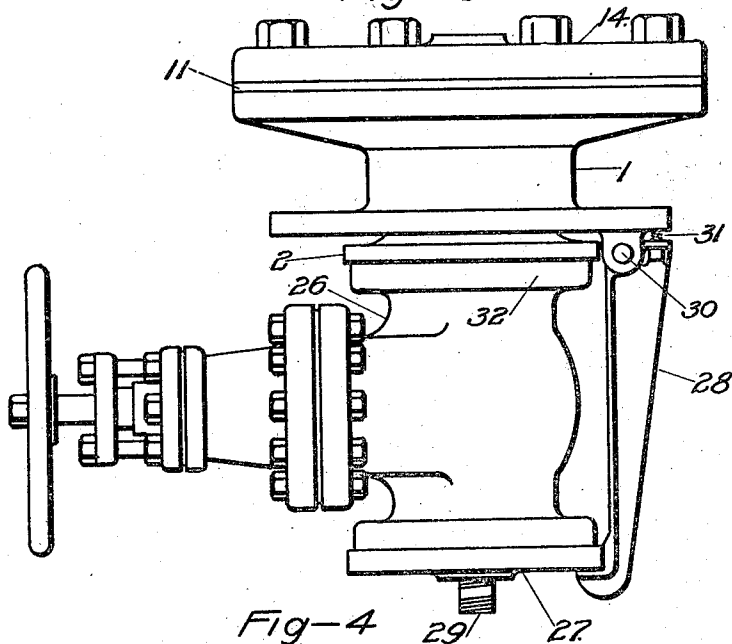


Fig-4

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UNITED STATES PATENT OFFICE.

EMERY E. CHAMBERLAIN, OF WATERTOWN, NEW YORK.

ORIFICE-CLOSER.

1,242,769.

Specification of Letters Patent.

Patented Oct. 9, 1917.

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To all whom it may concern:

Be it known that I, EMERY E. CHAMBERLAIN, a citizen of the United States, and a resident of Watertown, in the county of Jefferson and State of New York, have invented a new and Improved Orifice-Closer for the Closing and Sealing of Orifices, of which the following is a full, clear, and exact description.

10 In the closing of orifices in any receptacle subjected to pneumatic or hydraulic pressure for testing or otherwise, it has been heretofore customary to surround the orifice with a gasket and then clamp a plate or cover
15 over same by means of bolts, studs, or screws, necessitating the removal and replacement of said bolts, nuts or screws when the cover is to be removed or replaced.

20 I also appreciate that orifices have previously been closed or valves etc. clamped over said orifices by means of piston operated devices.

25 The object of my invention is to secure the closing and sealing of orifices, and the clamping of valves or receptacles between the orifice closer and a plate or over an orifice without the necessity of removing or replacing previously arranged fastenings such as nuts, bolts, studs, etc., which may
30 have been so placed for other purposes or this specific purpose.

35 I secure this object by so constructing said orifice closer that by first placing the orifice closer over the orifice or a plurality of orifices to be closed, and then by means of projections which have been previously arranged for other purposes upon the receptacle containing the orifice, I propose to hold or fasten the orifice closer to said receptacle
40 by means of slots in its body, hooks thereon, or other means of fastening without the necessity of removing, placing or replacing any nuts, bolts or similar fastenings.

45 Thereafter, by means of pneumatic or hydraulic pressure upon a diaphragm, which may be of any material or construction to suit the compressed agent, and which is inclosed within the device and is a part thereof, and which rests upon a disk and
50 said disk resting upon a cup shaped cover and all of which taken together form a train to transmit said pressure on said diaphragm to a gasket between said cup shaped cover and the body of the receptacle or valve,
55 around the orifice or orifices in the receptacle to which the orifice closer is now

clamped and thereby causing said orifice or orifices to be effectively closed or sealed by means of the pressure upon said diaphragm.

60 My invention does not reside primarily in the means of fastening the orifice closer to the receptacle, as any projections, bolts, screws, slots, opening in or on the receptacle or other means may be made use of by means of projections, slots, hooks, bolts, plates, or
65 other devices now in common use, and which may be made into or fastened to the body of the orifice closer to engage said projections, slots, etc., upon said receptacle, or even the whole body of the receptacle or valve may
70 be clamped between a plate or part and the orifice closer. And therefore, these fastenings may be varied to a considerable extent without departing in any way from the spirit of my invention.

75 Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, and in which:—

80 Figure 1 is a plan view showing a half section on line B—B through the body 1 of the orifice closer and the cup shaped cover 2 which seals the orifices 3 and 4 or through which it is desired to control the flow of
85 gases or liquids.

Fig. 2 is a vertical section through the orifice closer on line A—A, showing all of its parts.

90 Fig. 3 is an elevation and half section on line C—C, showing what I claim as my invention and nothing more, with one of the several means of attaching.

Fig. 4 is an elevation, showing a valve clamped between a cover or clamping plate
95 and the orifice closer and means of fastening.

100 In the specific fastening illustrated by Figs. 1 and 2, the device is shown fastened to the triple end of a freight reservoir for the purpose of testing the reservoir for leaks. The studs 6 shown in the reservoir
105 are a part thereof, and are placed therein for the purpose of eventually fastening a triple valve thereto, and are not a part of the orifice closer, and are used in this specific case as the best means of attaching the
110 orifice closer, said fastening being attained by means of oblong slots 7, one end of which are enlarged to allow the studs 6 and their nuts 8 to be passed through the body 1 of the orifice closer and then by ro-

tating the orifice closer upon its axis the studs 6 are passed into the narrow end of the slots 7 and the nuts 8 effectively locked over the body 1 of the orifice closer without having to be removed or replaced, and the orifice closer locked or fastened to the reservoir.

The clamping of the cup shaped cover 2 over the gasket 9 and the orifices 3 and 4 is attained by means of pneumatic or hydraulic pressure in the chamber 10 upon the diaphragm 11, said pressure being controlled by the valve 12 and transmitted to the cover cup 2 through the plate 13. The pressure exerted against the cover plate 14 is counteracted by the studs 6 or other means of fastening through the body 1 of the orifice closer, and the orifice closer is thereby held against receding from the reservoir 5 and the cover cup 2 firmly clamped over the orifices 3 and 4 and said orifices are effectively closed.

Whereas, it may now be assumed that the orifice closer is fastened securely to the receptacle 5 and that the orifices 3 and 4 are sealed against the ingress or egress of gases or liquids except by way of the valves 15 and 16, it is evident that we have complete control of the passage of gases or liquids under pressure through the orifices 3 and 4 by means of the valves 15 and 16. In the specific case illustrated in Figs. 1 and 2, the valves 12, 15 and 16 are supposed to be attached to flexible hose not shown and which furnish a means of conveying the compressed agent to the orifice closer and receptacle.

To release the orifice closer from the receptacle 5, the gas or liquid may be released from the receptacle 5 by means of the valves 15 and 16 which may be three way valves or by other means when necessary, after which the pneumatic or hydraulic pressure upon the diaphragm 11 may be relieved through a properly constructed valve 12 which we will assume to be a three way valve.

The orifice closer will then be left loose on the studs 6 and may be rotated back to its first position with the studs 6 in the large ends of the slots 7 where it may be easily removed from the studs 6 and the receptacle 5 without the necessity of removing nuts, bolts or similar fastenings.

The disk or plate 13 is fastened to the cover cup 2 by means of a part 17 shown as a screw in this specific case, but may be any similar means of fastening, as a bolt or rivet. The part 17 should be and is to be fastened tightly into the cup cover 2, but is left loose in the plate 13 so that plate 13 and cup cover 2 are free to move independently. Thus, after the pressure is applied to diaphragm 11, the plate 13 will come to rest with its top face parallel to the

diaphragm 11, and the cup cover 2 will rest squarely and evenly upon the face of the receptacle 5, although the means of fastening the orifice closer to the receptacle 5 may be such that the plane of the diaphragm 11 and the face of the receptacle 5 may be considerably out of parallel.

This feature of fastening 2 and 13 together is of particular advantage as by said means it is not necessary to have the means of fastening the orifice closer to the receptacle such that a plane vertical to the axis of the orifice closer will always be parallel to the face of the receptacle over which it is clamped.

Therefore, in the specific fastening illustrated in Figs. 1 and 2, it is neither necessary to have the three studs 6 of the same length, nor the nuts 8 thereon screwed down to the same distance from the face of the reservoir 5.

In Fig. 3 is shown the orifice closer with bolts 18 as a means of attaching a cover plate 19 to the orifice closer. The cover plate has oblong holes or slots in it similar to 7 in Fig. 1 to facilitate the removal and attaching of the cover plate 19, also an opening 20 as a means of fastening a valve for the release of pressure exerted upon a receptacle clamped between the plate 19 and the cupped cover 2 of the orifice closer. The operation of attaching or detaching the plate 19 is very similar to that of attaching or detaching the orifice closer as shown in Fig. 1. The bolts 18 are fastened solidly into the body 1 of the orifice closer, and the plate 19 is attached by passing the heads of bolts 18 through the large ends of slots in 19 similar to 7 and then rotating plate 19 so that bolts 18 will pass into the small ends of the slots and the heads of bolts 18 will be locked over plate 19 and secure it to the orifice closer which may then be operated as described in connection with Figs. 1 and 2, and pressures applied to a receptacle clamped between 19 and 2.

The projections 21, 22 and 23 serve in assisting in placing the different ports and covers directly over the orifices which they may be intended to cover and also in holding the parts in their proper places. The ribs 24 and 25 serve as a backing for the gaskets, which are necessarily narrow, and prevent them from blowing out while under pressure.

In Fig. 4 is the orifice closer attached to a valve 26 by means of a cover plate 27, and a plurality of hooks 28. A nipple 29 for the attaching of a valve for the releasing of pressures in the valve 26 is shown. The hooks 28 are pivoted on a pin 30 which allows them to move back while the valve 26 and the plate 27 are being inserted, the hooks being automatically held inward by the springs 31, and having a means of be-

ing held from going so far inward as to allow springs 31 to drop out or hinder valve 26 and plate 27 from being easily inserted. Therefore, both ends of the valve may be wholly or partly closed, and the passage of gases or liquids through it controlled by the valve itself, a valve attached to the nipple 29 and a valve attached to the cover cup 2 as shown in Fig. 1. The feature is that in testing valves, receptacles, etc., the orifice closer is easily and quickly attached or detached without the removal or replacement of nuts, bolts or similar fastenings. The clamping being accomplished by pressure upon the diaphragm 11 and and the pressure being then transmitted to gaskets on one or both ends of the receptacle by means of the plate 13 and the cupped cover 2 and a means of fastening the orifice closer to the receptacle.

Similar to the arrangement shown in Fig. 4, the hooks 28 may be shortened, and the cupped cover 2 lengthened to allow the orifice closer to be attached directly to a flange 32 by having hooks 28 hook over flange 32 instead of plate 27.

In reference to the valves 12, 15 and 16, they are not a part of my invention, and any valves now in common use may be made use of. As many or as few valves may be used in connection with the cupped cover 2 as are necessary to furnish means of controlling the flow of gases or liquids through the number of orifices which it is necessary to cover in any specific case. Another commendable feature is the fact that the compressed gases or liquids are at no time exposed to working joints or joints which are liable to wear loose and cause leakage. Also the small space 10 between 11 and 14 which it is necessary to fill to operate the orifice closer makes the orifice closer very efficient in the use of the agent used to operate it.

The few parts and simplicity of construction make an orifice closer not liable to get out of order easily and which should be easy to maintain.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:—

1. The combination with a reservoir, studs mounted on said reservoir, of an orifice closer including, a body, said body having slots therein, said slots being large at one end to receive said studs, a cover plate, the inner surface of said cover plate having a chamber formed therein, a diaphragm interposed between said cover plate and body, a cup-shaped cover for the orifice, a disk member, a screw having the head there-

of loosely mounted in said disk, the opposite end of the screw being rigidly secured to the cup-shaped member, gaskets mounted on said cup-shaped member, ribs formed on the member to retain the gasket, means for conducting liquid to said chamber under pressure, a valve mounted on said means for controlling the ingress and egress of the hydraulic fluid for controlling the pressure exerted on the diaphragm.

2. The combination with a receptacle having an orifice therein, and studs mounted on the receptacle, of a closure means for the said orifice including a body portion having openings therein providing means for detachable engagement of the body with the studs of the receptacle, a cover mounted on said body, a diaphragm interposed between said cover and body, a disk mounted on the under side of said diaphragm, said disk having an opening concentrically thereof, a cup shaped member, a screw member rigidly secured to said cup shaped member, the head of said screw being in engagement with said recess formed in the disk, means for conducting liquid to said chamber under pressure, and a valve mounted on said means for controlling the ingress and egress of the hydraulic fluid for controlling the pressure extended on the diaphragm.

3. The combination with a reservoir having an orifice therein, studs mounted on said reservoir, a body member having slots therein to receive said studs, a cover plate secured to said body, a diaphragm interposed between said cover plate and body, means for controlling liquid under the pressure to said diaphragm, a valve mounted on said means, and a cup shaped member connected to said diaphragm adapted to close said orifice upon ingress of the liquid under pressure.

4. The combination with a reservoir having an orifice therein, studs mounted on said reservoir, a body member having slots therein to receive said studs, a cover plate secured to said body member, a diaphragm interposed between said cover plate and body, a disk secured to said diaphragm, a cup shaped member having a universal connection with said disk, means for conducting liquid under pressure to said cover plate, a valve mounted on said means for controlling the ingress and egress of the hydraulic fluid for controlling the pressure exerted on the diaphragm.

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Witnesses:

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