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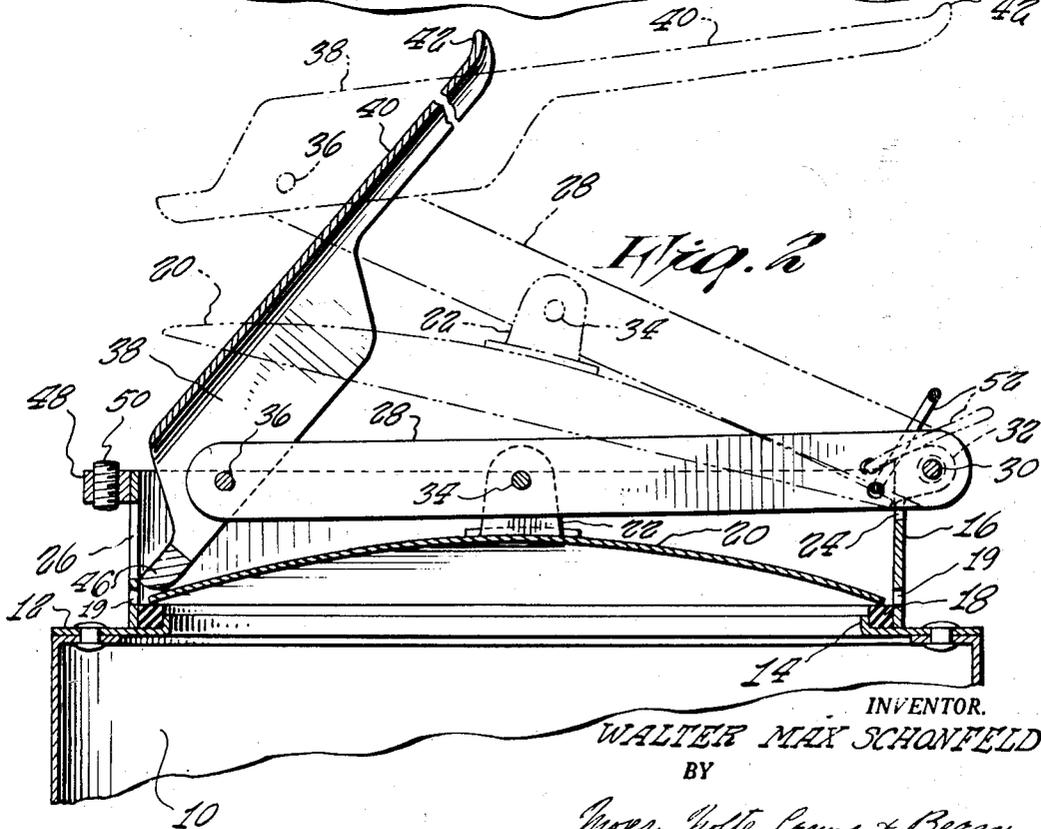
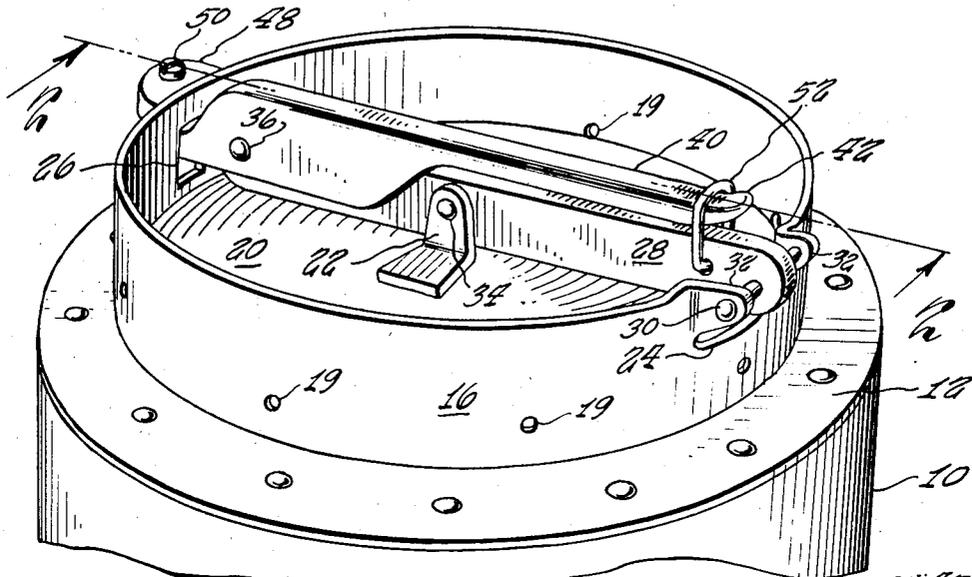
W. M. SCHONFELD
WATER TIGHT TANK CLOSURE

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2 Sheets-Sheet 1

Fig. 1



INVENTOR.
WALTER MAX SCHONFELD

BY
Hess, Holt, Crows & Berry
ATTORNEYS

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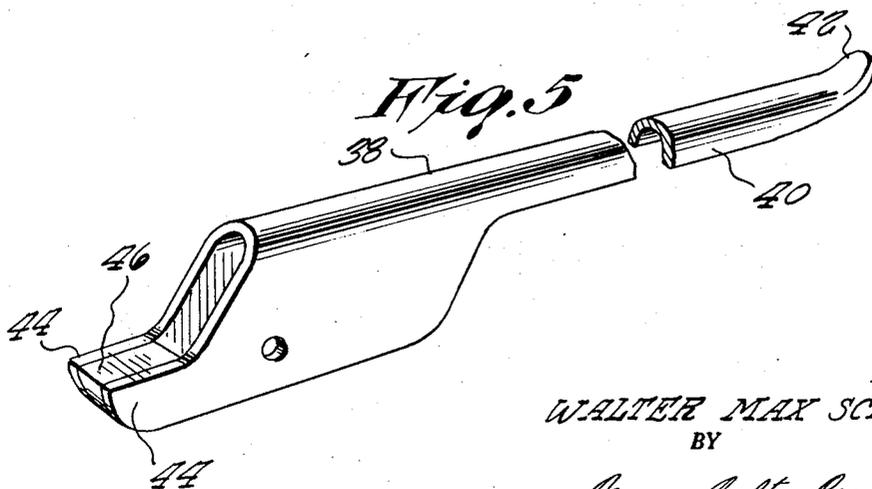
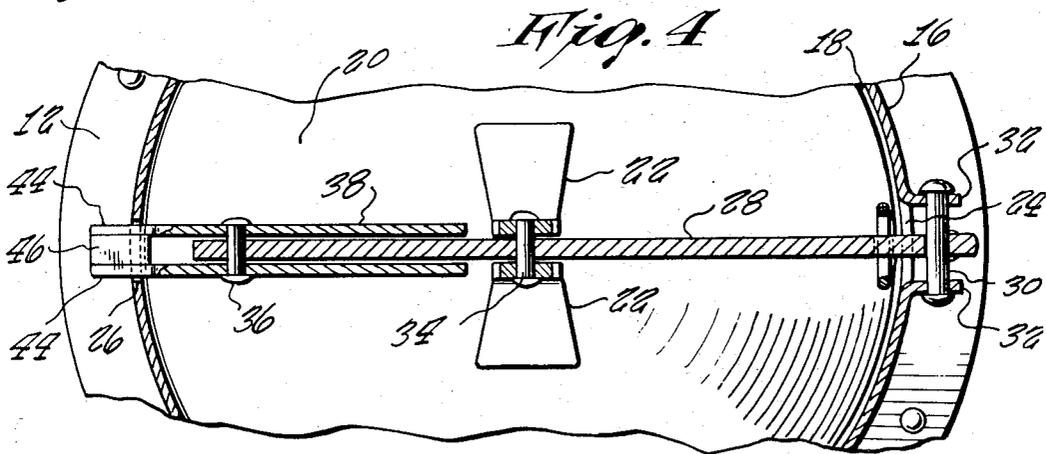
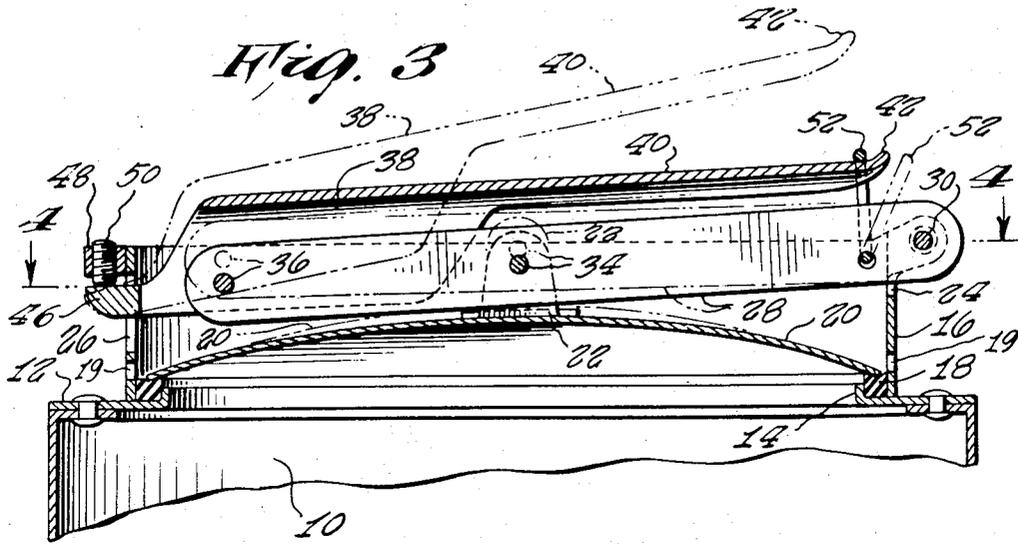
W. M. SCHONFELD

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2 Sheets-Sheet 2



INVENTOR.

WALTER MAX SCHONFELD
BY

Wass, Rolfe, Cross & Berry
ATTORNEYS

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WATER TIGHT TANK CLOSURE

Walter Max Schonfeld, San Francisco, Calif., assignor to
Todd Shipyards Corporation, a corporation of New York

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2 Claims. (Cl. 220—57)

This invention relates to closures for water-tight tanks such, for example, as tanks which are provided in lifeboats for holding provisions or fresh water. In the construction of tanks for such purposes, it is important that a closure be provided which is effectually water-tight so as to protect the contents of the tank from contamination, and it also is important that the fastening mechanism be of such nature that the closure may be opened in the simplest possible manner, and after use may be quickly restored to a tight condition. It is also important that the cover member and operating mechanism be united in a permanent assembly so that there are no loose parts which might be lost. It is also desirable that the closure assembly be compact with no parts projecting substantially beyond the boundaries of the tank opening either laterally or vertically, when the tank is sealed, so that the tank may be readily stowed in a small space.

It is an object of the invention to provide a tank closure which can be tightly sealed, instantly opened, in which no parts have to be separated from the assembly in the use of the closure, and in which no parts are of such a nature that they would be likely to become fouled up by moisture or freezing to such an extent as to prevent the cover from being opened or closed.

Other objects and advantages of the invention will appear in the course of the description of one specific illustrative embodiment thereof.

In the accompanying drawings:

Figure 1 is a perspective view of the top portion of a tank showing the improved closure mechanism thereon.

Figure 2 is a sectional view on line 2—2 of Fig. 1 showing the pressure lever moved to a position permitting the opening of the tank cover, and showing in broken lines the partly open cover.

Figure 3 is a similar view showing the pressure lever closed so as to seal the cover, an intermediate position of the lever being indicated in broken lines.

Figure 4 is a horizontal section on line 4—4 of Fig. 3.

Figure 5 is a perspective view of the pressure lever, parts being broken away.

Referring to the drawings in detail, 10 is a tank which may obviously be of any desired shape. On top of the tank is secured a flat ring 12 having at its inner edge an upwardly turned flange 14 defining a large opening into the interior of the tank. Secured to the upper surface of the ring 12 is a cylindrical ring or upright collar 16 which may be welded or otherwise secured to the flat ring 12. A space is provided between the flange 14 and the collar 16 providing an annular recess for the reception of a soft packing 18 of rubber or the like. Just above the packing the collar 16 is preferably pierced with a number of drain holes 19.

The tank cover comprises a convex plate 20, the edge of which is adapted to seat upon the packing 18. On top of the plate are welded or otherwise secured two brackets 22. In the collar 16 is a notch 24 in the upper edge thereof, and a deeper notch or hole 26 diametrically opposite thereto. A hinge link 28 is provided which is preferably

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in the form of a sturdy metal bar, this being pivoted at its rear end on a pintle 30 mounted in ears 32 at opposite sides of the slot 24. These ears are conveniently formed by cutting the slot 24 in inverted T form and then bending out the parts of the collar wall above the head of the T cut to form the outwardly projecting ears. The bar 28 is preferably long enough to reach nearly to the side of the collar opposite to the pintle 30, but terminates somewhat short of engagement therewith. The bar 28 passes between the brackets 22 and is permanently pivoted thereto by a pivot pin 34. Pivotaly mounted upon the free end of the bar 28 by means of a pivot 36 is a pressure lever 38. The pressure lever 38 is preferably formed of U-shaped section and is provided with a long handle portion 40 preferably terminating in an upwardly curved tip 42. At the other end the lever 38 is formed into a bill 44, the two extremities of the U-shaped plate being preferably welded to a block 46 so as to make a strong solid bill or nose. This is adapted to pass through the slot or hole 26. Welded or otherwise secured to the outside of the collar 16 above or across the top of the slot or hole 26, is a lug 48 in which screws an abutment screw 50. A ring 52 or other suitable means is provided for locking down the end of the pressure lever when the cover is closed.

The bill or part of the lever 38 projecting beyond the pivot 36 is made quite short not only to provide a more advantageous leverage for the application of the closing pressure, but also to enable the lever to be swung upwardly far enough to permit the bill to be withdrawn from the slot or hole 26 before the end of the bill contacts the cover. This position is illustrated in full lines in Fig. 2.

The operation of the device will be plain from the description and drawings. When the pressure lever is pressed down, as shown in Figs. 1 and 3, the bill 44 engages the abutment screw 50 which is adjusted so that when the lever is all the way down enough pressure will be exerted on the cover plate through the action of the lever and hinge bar 28 to exert a slight flattening out effect upon the convex plate, as indicated by the broken line in Fig. 3, so that a firm and resilient pressure is exerted by the edge of the plate on the packing ring, thus insuring a tightly sealed joint. Once the screw 50 has been properly adjusted, it usually does not have to be moved again during ordinary use of the device.

To open the cover the ring 52 is merely swung backwardly off of the top 42 of the lever, whereupon the latter is moved upwardly to a position as shown in Fig. 2, which will serve to withdraw the bill from the hole or slot 26 and the lever bar 28 and cover plate may now be swung upwardly around the pintle 30 and laid over out of the way, this being done without disconnecting any part of the assembly, so that there is no danger of any of the parts becoming lost.

The tank can be again sealed by merely swinging the cover back and lowering the lever 38 until the bill passes through the slot 26 and engages the abutment screw 50 and then exerting pressure on the end of the lever. Powerful sealing pressure is thus applied due to the compound lever action.

It will be observed that the closure operating and securing devices are chiefly confined within the space enclosed by the collar 16. Nothing projects laterally beyond this collar except the end of the bar 28 through which the pintle 30 passes, the lug 48 and the tip of the bill 44. Also there is only a slight projection of the top of the bar 28 and lever 38 above the top edge of the collar. This makes for a very compact construction, permitting storage of the tank in a small space. Also there are no projecting fastening parts which might become dislodged if accidentally struck. The construc-

tion is therefore very suitable for use in confined quarters as on a lifeboat or the like.

While one preferred embodiment of the invention has been illustrated and described in detail, it is to be understood that changes may be made therein and the invention embodied in other structures. It is not, therefore, the intention to limit the patent to the specific construction illustrated, but to cover the invention broadly in whatever form its principles may be utilized.

I claim:

1. In a closure for tanks having an opening in a wall thereof, a seat surrounding said opening, and an upstanding cylindrical collar surrounding said seat, a resilient packing ring mounted on said seat, and confined by said collar, a cover plate adapted to fit within said collar upon said packing ring, a hinge link pivotally connected to said collar at one side of said seat and extending across said cover plate but terminating short of the other side of said collar, a pivotal connection between an intermediate point of said hinge link and said cover plate, a pressure lever having an inverted U-shaped portion enclosing and pivoted to said hinge link at the end thereof remote from the point at which said link is hinged to the collar, said collar having a slot in the wall thereof adjacent to the end of the link to which said lever is pivoted, means forming an abutment on the collar at the upper end of said slot, said pressure lever having a lever arm extending across the cover plate and having its U-shaped portion cut away beyond the point where it is pivoted to said link to provide ears projecting forwardly of said pivot point, means for connecting said ears so as to form a bill adapted to be swung outwardly through said slot into engagement with said abutment when the body of the lever is moved down to a position adjacent to said hinge link, the length of said bill from the point where the pressure lever is pivoted to the hinge link being short enough to permit the bill to move out of the slot in the collar and clear the abutment when the pressure lever is raised, so as to permit the cover assembly to swing open without the necessity of dismounting any portion of the assembly, said hinge link and pressure lever being substantially straight, said pressure lever lying closely over said link when closed in down position, the major portions of said link and lever being enclosed within the confines of said collar so as to present a minimum of projection above said collar, thereby permitting close stowage of the closed tank.

2. In a closure for tanks having an opening in a wall thereof, and an upright collar surrounding said opening and means providing a seat surrounding said opening

inside of said collar, a resilient packing ring mounted on said seat, and confined by said collar, a convex cover plate adapted to fit within said collar upon said packing ring, said collar having drain openings therein just above the seat, said collar having a slot in the upper edge thereof, portions of the collar at each side of said slot being bent radially outwardly to form pintle supporting ears, and a pintle mounted on said ears and bridging said slot, a hinge link pivoted at one end upon said pintle and extending across the greater part of the diameter of the cover plate but terminating short of said collar, a bracket on the apex of the cover plate pivotally connected to said hinge link at a point between the ends thereof, the collar having an opening therein at a point diametrically opposite to the slot and pintle, an abutment upon said collar above said opening, a pressure lever pivoted near one end thereof to the free end of the hinge link, the short end of the pressure forming a bill portion adapted to project through the opening in the collar to a position in engagement with said abutment and swingable to a position in which it is completely withdrawn from under the abutment so as to permit the cover plate to be swung upwardly, the longer end of said pressure lever extending substantially across said cover plate but terminating short of said collar, said pressure lever and hinge link lying in substantial parallelism when the lever is depressed and being in major part received within the confines of the collar, so that only a minor portion thereof projects above the collar, portions of said link and pressure lever being spaced above the convex cover plate between the center and edges thereof owing to the convexity of the cover, so as to provide space for the fingers permitting the link and locked pressure lever to be grasped and used as a handle for lifting the tank, and means for locking said lever in depressed position.

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