June 12, 1945. A. C. ANDERSON 2,377,916

PUMP

Filed April 17, 1944

Fig. 1.

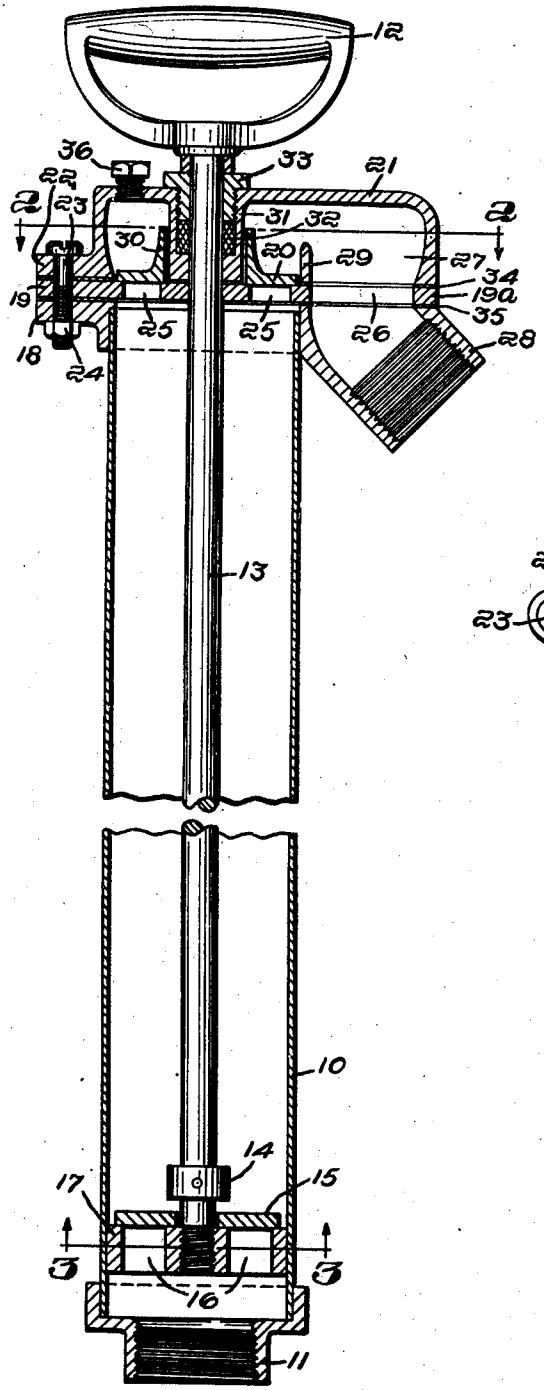


Fig. 2.

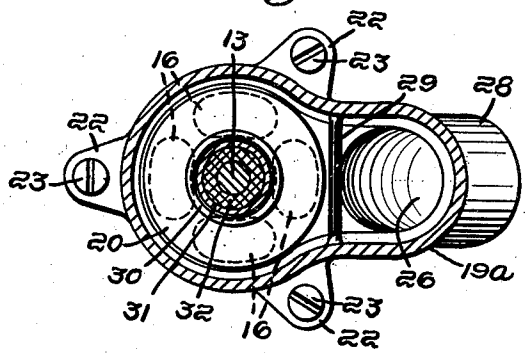
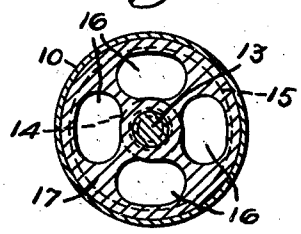


Fig. 3.



Inventor:
Arthur C. Anderson
by Spear, Rawlings & Spear.
Attorneys

Patented June 12, 1945 2,377,916

UNITED STATES PATENT OFFICE

2,377,916

PUMP

Arthur C. Anderson, Wildwood Crest, N. J.

Application April 17, 1944, Serial No. 531,368

4 Claims. (Cl. 103—178)

This invention relates to improvements in pumps, and particularly to bilge or sump pumps especially designed for installation in small craft as a permanent fixture around which the lockers, seats, etc. are afterwards built.

The conventional bilge or sump pump has its intake valve located at the lower end of the pump cylinder. It is apt to become clogged by dirt, chips, etc. drawn into the pump.

As a consequence of this construction, when such a pump requires cleaning or repair, the piping at either the suction side or the discharge side of the pump, as well as the pump itself has to be dismantled. This usually requires unscrewing the pipe fittings from the ends of the pump cylinder as well as unscrewing the pipes from the fittings. Inasmuch as such threaded fittings are frequently inaccessibly located, and moreover because of the tendency of the threads to corrode and "freeze," the task of disassembling, cleaning or repairing and reassembling such a pump is usually a difficult and tedious one.

The broad object of my present invention is to provide a pump of such design that regardless of its location when installed in the boat, all of the working parts of the pump may be readily removed for purposes of cleaning or repairing without the necessity of removing any of the piping.

In achieving this object, I locate the discharge valve of my pump at the top of the pump cylinder and so assemble the same to the various other working parts of the pump that by simply unbolting a few bolts, all working parts may be lifted out of the pump cylinder as a unit without disturbing any of the pipe connections.

Other objects and advantages will appear as the description proceeds. In the accompanying drawing:

Fig. 1 is a vertical section through a pump in accordance with my invention, and

Figs. 2 and 3 are cross-sections on the lines 2—2 and 3—3, respectively, of Fig. 1.

My pump comprises the usual pump cylinder 10 to the lower end of which is assembled in any suitable manner a suction pipe connection 11 for an inlet pipe or hose (not shown).

Reciprocable in cylinder 10 by means of handle 12 is the usual piston rod 13 having near its lower end a fixed stop 14 to limit the upward movement of the usual piston valve 15 on rod 13. Valve 15 controls the ports 16 of a piston 17 fast on the lower end of piston rod 13. Piston 17 has a watertight fit with the inner face of the cylinder wall. This may be a close working fit, or the periphery of the piston may be provided with an annular groove in which a packing ring is seated.

At its upper end cylinder 10 is provided with a flanged head 18. Surmounting the same is a flanged discharge valve plate 19, a discharge valve 20, and a valve cover 21 flanged as at 22 to overlie and be removably fastened to the flanged cylinder head 18 by any suitable fastening means, as the bolts 23 and nuts 24.

Interiorly of the cylinder, valve plate 19 is provided with a plurality of ports 25 controlled by the overlying discharge valve 20. Said plate has a lateral extension 19a provided with an outlet port 26 connecting the chamber 27 of valve cover 21 with a discharge pipe connection 28 integral with cylinder head flange 18.

Surrounding discharge valve 20 is a gate or dam 29 of a height sufficient to build up enough water in the chamber 27 to keep the discharge valve 20 flooded. Said valve rests lightly on the supper face of discharge valve plate 19 and is provided with an axial hub or guide 30 loosely sleeved around a packing box 31 which is integral with and depends from the under side of valve cover 21 and rests upon valve plate 19.

Packing box 31 surrounds the upper end of the piston rod 13 and contains a packing 32 compressible by a packing nut 33 to form a tight seal. This box 31 backs up plate 19 and helps to prevent distortion of said plate under repeated blows of piston valve stop 14 in the operation of the pump.

Suitable sealing gaskets 34 and 35 may be inserted between the respective faces of the valve plate and the valve cover 22 and cylinder head 18, respectively.

Desirably, the pump is provided with a priming plug 36 let through valve cover 22.

The operation is as follows: With cylinder 10 full of water from a previous stroke, the upstroke of piston rod 13 causes valve 15 to close the ports 16 in piston 17, creating suction beneath the piston 17 to cause the water to flow through intake pipe 11 into the cylinder, and causing pressure in the upper part of the cylinder which in turn causes discharge valve 20 to open so that the water may flow through the ports 25 until it overflows the dam 29 and discharges out of chamber 27 through discharge port 26 and pipe connection 28.

On the downstroke of piston rod 13, discharge valve 20 closes to prevent the water in the cylinder from flowing back with piston 17 and thereby opening the valve 15. Water in the cylinder below the piston flows through the ports 16 of the piston as the piston descends.

From the foregoing it will be evident that all of the working parts of my pump may be disassembled from the pump cylinder without disturbing the fittings 11 and 26 or the pipe connections to said fittings, by simply unfastening the bolts 23 and lifting all working parts as a unit from the upper end of the pump cylinder.

Various modifications in design and arrangement of the pump may obviously be made within the spirit and scope of my invention as defined by the appended claims.

What I therefore claim and desire to secure by Letters Patent is:

1. A pump, comprising a cylinder having at its upper end a flanged head and a connection for an outlet pipe and having at its lower end a connection for an inlet pipe, a piston rod reciprocable in said cylinder, a piston fast to the lower end of said piston rod and having ports, a valve slidably supported by said piston rod in control of said ports, a discharge valve plate surmounting the cylinder head and having a plurality of ports alined with the cylinder, a valve cover surmounting said plate and slidably supporting said piston rod, said valve cover having a chamber in communication with the outlet pipe connection, a discharge valve in said chamber in control of the ports of said plate, and means removably fastening said plate and valve cover to said cylinder head to permit the working parts of the pump to be removed without disturbing the pipe connections at the inlet and discharge sides of the pump.

2. The pump of claim 1, wherein a packing box depends from the under side of the valve cover and contacts the upper face of said discharge valve plate, and the discharge valve is provided on its upper face with a tubular guide portion loosely sleeved about said packing box.

3. The pump of claim 1, wherein a dam of a height sufficient to keep said discharge valve flooded surrounds said valve within said chamber.

4. A pump, comprising a cylinder having at its upper end a flanged head and a connection for an outlet pipe and having at its lower end a connection for an inlet pipe, a piston rod reciprocable in said cylinder, a piston fast to the lower end of said piston rod and having ports, a valve slidably supported by said piston rod in control of said ports, a discharge valve plate surmounting the cylinder head and having a plurality of discharge ports alined with the cylinder and having a lateral extension provided with an outlet port in communication with the outlet pipe connection, a valve cover surmounting said plate and slidably supporting said piston rod, said valve cover having a chamber provided with a lateral extension in communication with the outlet port of said plate, a discharge valve in said chamber in control of the discharge ports of said plate, and means removably fastening said plate and valve cover to said cylinder head to permit the working parts of the pump to be removed without disturbing the pipe connections at the inlet and discharge sides of the pump.

A. C. ANDERSON.