2 Sheets—Sheet 1.

E. SANDERS.

Pump.

No. 210,055. Patented Nov. 19, 1878.

Fig 1.

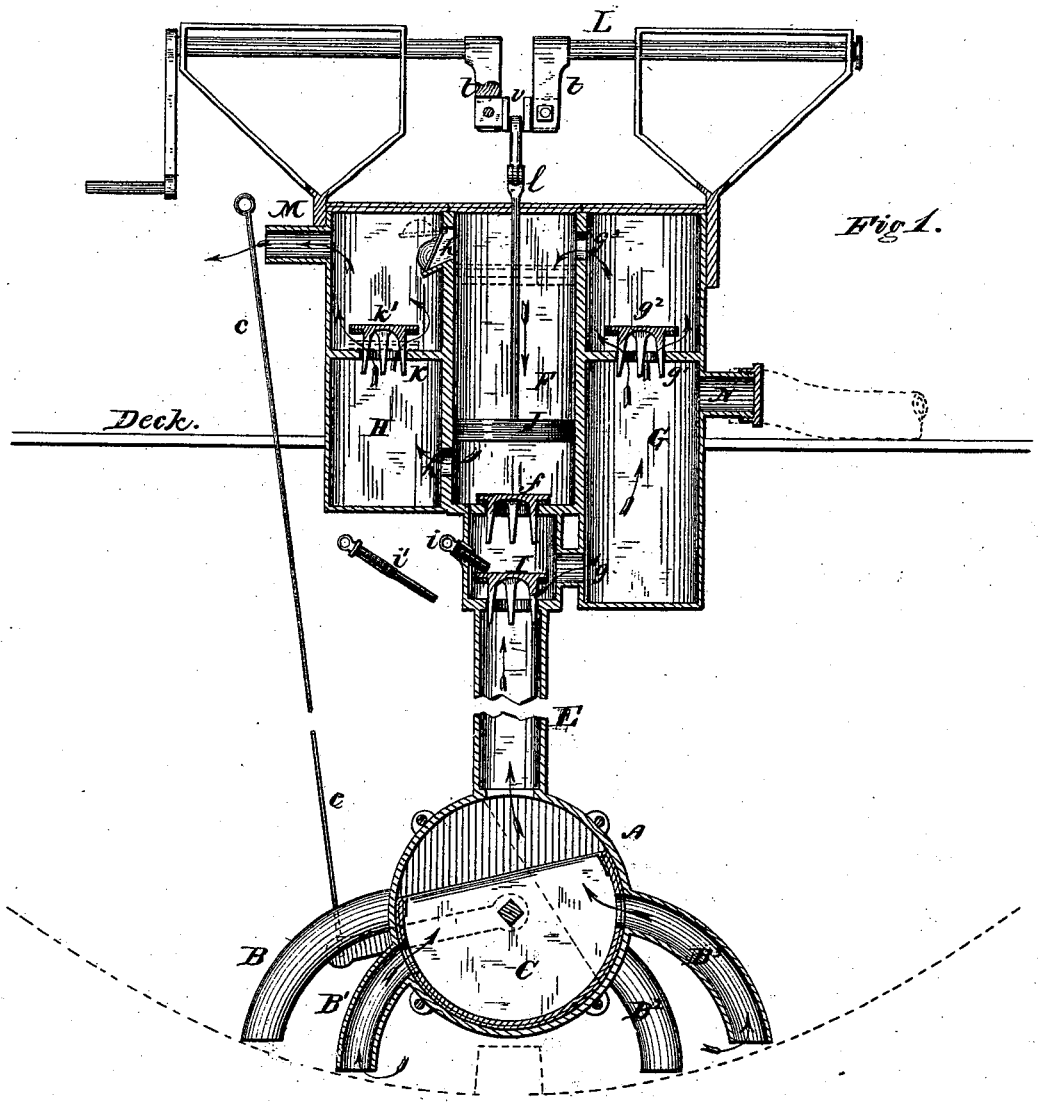
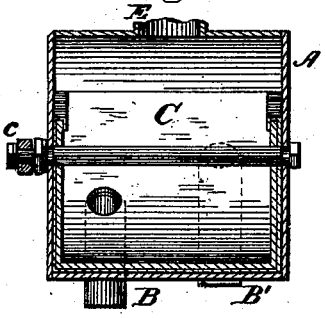


Fig 2



Witnesses

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William Blackstock.

Inventor.

Edwin Sanders

By L. Hill.

His Atty.

2 Sheets—Sheet 2.

E. SANDERS.

Pump.

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Fig 3.

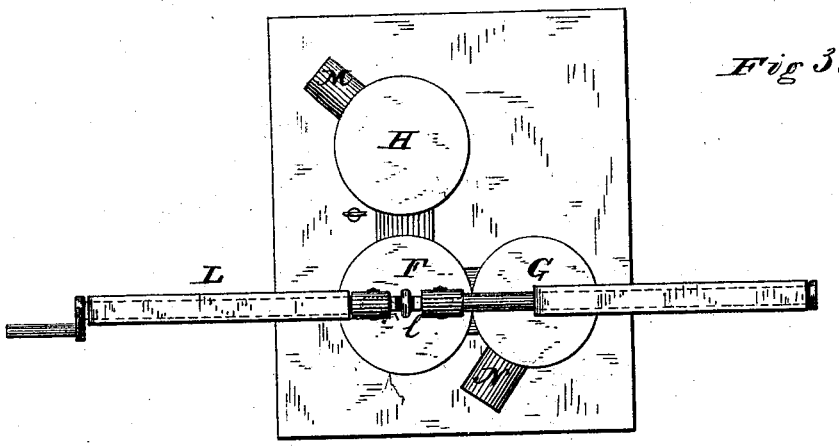
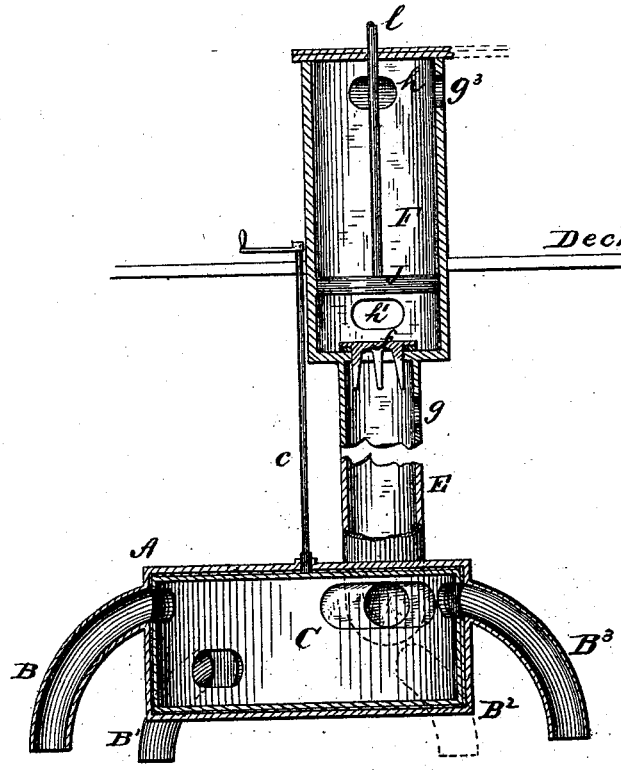


Fig 4.



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UNITED STATES PATENT OFFICE.

EDWIN SANDERS, OF MAITLAND, YARMOUTH, NOVA SCOTIA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **210,055**, dated November 19, 1878; application filed September 23, 1878.

To all whom it may concern:

Be it known that I, EDWIN SANDERS, of Maitland, Yarmouth, Nova Scotia, have invented a certain new and useful Improvement in Pumps; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of the pump; Fig. 2, a sectional view of the lower cylinder and valves; Fig. 3, a top plan, and Fig. 4 a vertical section of a modified form of pump.

Similar letters of reference in the several figures denote the same parts.

This invention is an improvement in pumps, which, though capable of use under various adaptations for general purposes, is particularly designed for ships' pumps; and it consists in the entire pump and the various combinations of mechanism contained therein, substantially as I will now proceed to describe.

In the drawings, A is a cylinder or chamber, provided with four, more or less, feed pipes or branches, B B^1 B^2 B^3, one set of which are adapted to receive water from one side of the keelson or the bilge, and the other from the other side, and convey it to the cylinder. The cylinder may be arranged at any point between the said feed-pipes and the working mechanism of the pump where it can be conveniently and effectively located, its principal function being to furnish a receptacle in which valves or cocks can be placed to cut off the feed from one or the other set of pipes, or to cut off the access of water from all of said pipes to the interior of the pump, as will be hereinafter set forth.

Within the cylinder is a rotary cock or valve, C, adapted to be turned and adjusted by a rod, *c*, or its equivalent, extending to the deck or other convenient place, and when thus turned to cut off the access of water through the pipes on one side of the keelson or bilge, or on the other side thereof, or on both sides thereof; the object in cutting off the pipes on one or the other side being to prevent the heeling of the ship from letting air into the cylinder, and the object of cutting off the access of water through the cylinder to the pump being to enable the pump to be adjusted and operated for pumping water through a hose from the sea or other place, and not through the pipe leading to the hold.

The cylinder may be arranged horizontally or vertically, and its form and construction, as well as that of the contained cut-off cock or cocks, may be varied indefinitely, the only limitation being that the cut-off valves or cocks shall be enabled to produce the effects above referred to.

The cut-off may be by a single valve or cock, C, or any equivalent cock or cocks, and the valve *c*, rod, or other equivalent device for operating the said valves or cocks, may be connected with an indicator on deck, to indicate at all times the actual position of the cut-off or check valves or cocks.

E is the main pipe, leading from the feed-branches or cylinder A to the working mechanism of the pump.

The body of the pump is composed of three cylinders or chambers, F G H, of which I will designate F as the first, G as the second, and H as the third. When the valve C is not adapted to cut off the entire flow of water at will, a valve, I, must be arranged somewhere between the feed-pipes and the cylinders F G that will accomplish that purpose, and to that end a puppet or other form of valve may be provided in a connection between the pipe E and cylinders F G with a screw rod or rods, *i i'*, extending in over it, by the adjustment of which screw-rod said valve can have a limited movement upward from its seat, or can be fastened down upon its seat, at pleasure.

When the cylinder valve or cock C is adapted to cut off all the water from the tube E, the valve I and rods *i i'* may be dispensed with.

The pipe E, or the connection in which works the valve I, communicates with cylinder F through a valve-port having a valve, *f*, which seats downward, and with cylinder G through an open port, *g*.

The cylinder G is divided into two chambers by a partition, g^1, having a valve-port and valve, g^2, seating downward, and the upper chamber thereof communicates with the upper part of cylinder F through an open port, g^3.

The cylinder H is also divided into two

chambers by a partition, *k*, having a valve-port and valve, *k'*, seating downward; and the upper chamber thereof communicates with F by a valve, *h*, and the lower by an opening, *h'*, the valve *h* seating toward F, to prevent the water in H from backing into F or G.

The piston or plunger is shown at J working in the cylinder F between the valve-port *h* and the opening *h'*, it being actuated by a rod, *l*, and crank-shaft L, or other suitable means. The discharge is from the upper part of the cylinder H through the spout or port M.

The cylinders F G H are provided with tops or covers, closely packed and securely fastened, but removable, for the purposes of cleaning, adjusting, or repairing. The lower chamber of cylinder G is also provided with a side pipe, N, normally closed, but adapted to be opened and connected with a pipe or hose, for the purposes hereinafter described.

The movement of the plunger J may be shortened or lengthened by a peculiar construction of crank, shown in Fig. 1, in which *t t* are the arms of the crank, and *v* a crank-pin, made in the form of a yoke or U-shaped plate, the ends of which are fastened in the crank-arms, while the middle forms the crank-pin. By reversing the position of this yoke the crank-pin may be brought at the end of the arms, to lengthen the throw, or close to the line of the crank-shaft, to increase the power and shorten the throw of the piston.

I do not limit myself to any particular form of valves, nor to any particular form or arrangement of the cylinders, so long as the various chambers, ports, valves, and plunger co-operate substantially as herein shown, and produce substantially equivalent results.

The operation of this improved pump is as follows: For pumping from the hold, the valve C is to be adjusted so as to allow the water to enter from both sides of the keelson, or from that side which is heeled down the most, in which latter case the same valve should be made to cut off all the passages through the pipes except the one from which it is desired to draw. The pump being primed, the upstroke of the piston will open the valves *f*, close valves g^2 *k'*, raise water through the pipe E, and force water from the upper part of cylinder F through port *h* into the upper part of cylinder H, and discharge it at M. Then the downstroke of the piston will reverse the valves, raise water from E through G into the upper part of F, and force water from the lower part of cylinder F, through port *h'* and valve *k'*, into the upper part of cylinder H, and discharge it at M. The pump thus acts as a continuously-discharging or double-acting pump. The cylinder H need not be covered while the pump is thus operated.

For the purposes of a force-pump, the cylinder H should be covered tight, a pipe or hose connected to the discharge M, and, if necessary, the crank may be shortened, so as to give more power. The pump is then worked, as above described, so long as there is any water in the hold; and it will be found useful for washing decks, extinguishing fires, &c. If the water in the hold be exhausted, water may be pumped from the sea or other source by adjusting the cut-off valve to stop the flow through the pump-barrel, and then opening the side pipe, N, and attaching a hose thereto. The operation of the pump is the same as before, except that the water comes from a different source, and through the pipe N instead of the pipe or barrel E.

It will be observed that this pump, with its various adjustments, takes the place of the ordinary two bilge-pumps, two main or center pumps, and force-pumps required on ship-board, it being only necessary to use the one center pump, and to apply this compound bilge and force pump to it.

Having thus described my invention, I claim as new—

1. In a ship's pump, the combination of induction-branches, leading to opposite sides of the keelson, with a main pipe, E, into which they all conduct the water, and with a valve or valves operated by a single rod extending to the deck, by a movement of which rod, at the will of the operator, any or all of the induction-branches and the main pipe can be closed by a person on deck, substantially as described.

2. The cylinder A, provided with the internal rotary valve, C, operated by a rod, *c*, extending to the deck, in combination with the main pipe E and the several induction-branches leading to different sides of the bilge, substantially as described.

3. In a pump having three chambers, F G H, a piston, J, valves *f h k'* g^2, and ports *g* g^3 *h'*, the valve g^2, arranged above the lower end of chamber G, in combination with the auxiliary induction pipe or port N, arranged below said valve, and with the main induction, substantially as described.

4. In a pump, the combination of a double-arm crank, *t t*, and U-shaped reversible crank-pin *v* with the plunger or piston, whereby the stroke can be shortened and power increased in using the device as a force-pump, substantially as described.

EDWIN SANDERS.

Witnesses:
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