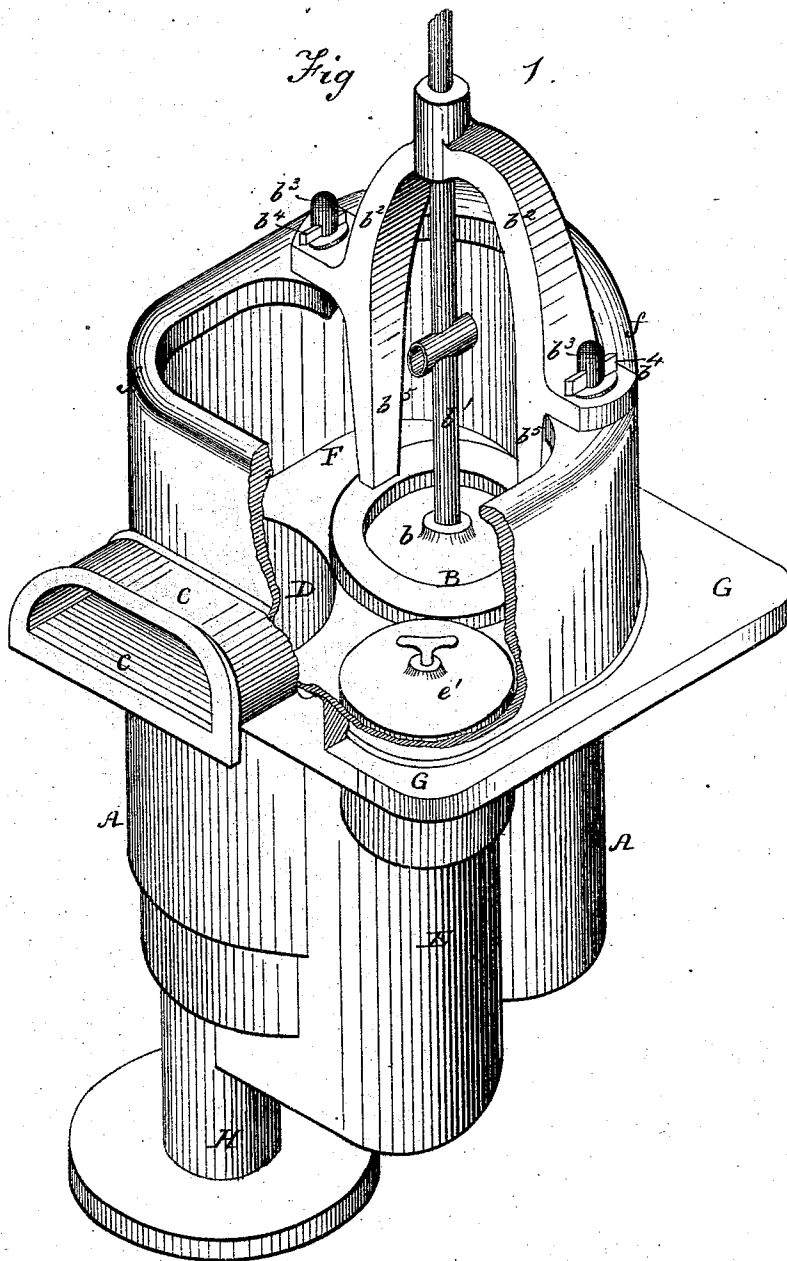


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Pumps.

No. 154,785.

Patented Sept. 8, 1874.



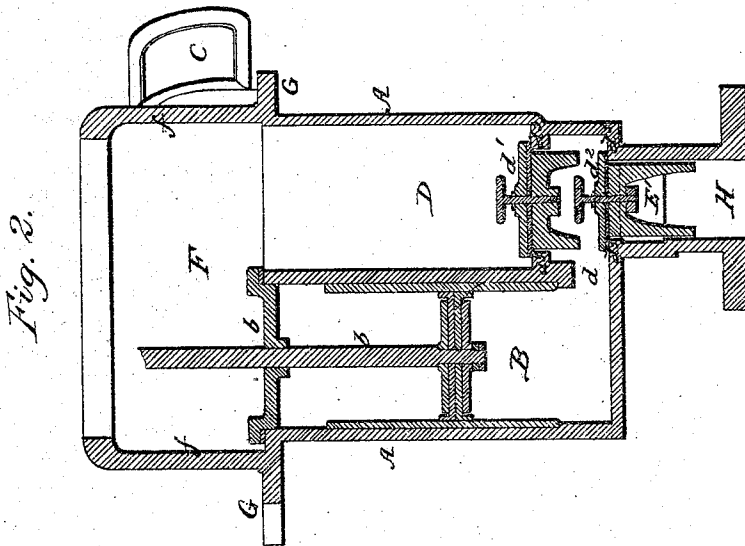
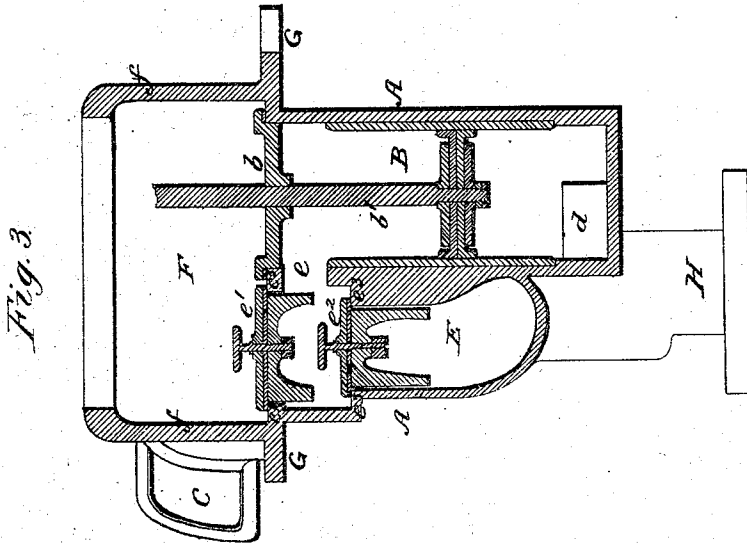
Witnesses.
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E. M. Byrnes.

Inventor
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by their attorney
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Witnesses.
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UNITED STATES PATENT OFFICE.

FRANCIS CURTIS AND EDWARD P. RUSSELL, OF NEWBURYPORT, MASS.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **154,785**, dated September 8, 1874; application filed May 5, 1874.

To all whom it may concern:

Be it known that we, FRANCIS CURTIS and EDWARD P. RUSSELL, both of Newburyport, in the county of Essex and State of Massachusetts, have invented Improvements in Pumps, of which the following is a specification:

Our invention relates to improvements in pumps, particularly applicable for use on board ship and in other places, where compactness, combined with simplicity and ready removal and replacement of the working parts, as well as non-liability of disarrangement, are specially required; the nature of which will be hereinafter fully explained by reference to the accompanying drawings, which form part of this specification.

Figure 1 shows a perspective view, partly in section; Figs. 2 and 3 vertical sections, of a pump arranged according to our invention.

A A represent the main casing of the pump; B, the main or piston cylinder; and D E a pair of valve-cylinders, all formed in a single casting, the upper portion of which is so constructed as to form a basin, F, for the reception of the water or liquid raised by the pump. C is a nozzle or spout formed in the side of the basin F, the center of which is in a line with the center of the basin F and of the main or piston cylinder B. The cylinder B is provided with a cap or cover, *b*, through which the piston-rod *b*¹ passes. *d e* are ports or openings formed at the lower and upper ends of the cylinder B, the lower, *d*, being connected with the cylinder D, and the upper, *e*, with the cylinder E. The valve-cylinders D E are provided with puppet-valves *d*¹ *d*² and *e*¹ *e*², arranged one above and the other below the ports or openings *d e*. The seats *d*³ *e*³ of the valves *d*¹ *d*² *e*¹ *e*² are formed of chilled metal, and are placed around the cores which form the cylinders, when arranging the molds for casting the pump; and when the metal of which the pump is to be formed is run into the mold and allowed to cool they form part of the cylinders, in proper position to receive the valves without further fitting. The upper edges of the main cylinder B and the cylinders D E are arranged in a line with the bottom of the basin F. The cap or cover *b* for the cylinder B is retained in position by means

of the cross-stay *b*², secured to the upper edge of the wall *f* of the basin F by means of studs *b*³, which pass through holes in the stay *b*², and are secured by means of keys *b*⁴, passing through the studs *b*³. In the center of the stay *b*² the bearing for the piston-rod *b*¹ is formed, and on the under side it is provided with vertical projections *b*⁵, which, when the cap or cover *b* and the stay *b*² are in position, press firmly on the cap or cover *b* and retain the same firmly in position, while at the same time, when it is required to remove the piston, it is simply necessary to take out the keys *b*⁴, and, by drawing out the piston-rod *b*¹, the piston-rod *b*⁶, cap *b*, and the stay *b*², and retaining-projections *b*⁵, may be all removed together from above the water-line. G is a flange, arranged around the case A, for the purpose of retaining the pump in position. The suction-pipe H is formed in the main casting by the continuation of the cylinder D, the cylinder E being provided with a passage, E', leading thereto.

By this arrangement of pump, the main cylinder B and the valve-cylinders D E all open into the basin F, and the valves *d*¹ *d*² and *e*¹ *e*², as well as the cylinder-head or cover *b*, will be constantly flooded, thereby making all the joints air-tight, and the valves *d*¹ *d*² and *e*¹ *e*² may be readily removed and replaced without the necessity of unscrewing bolts or other retaining means, as is usual in this class of pumps.

It will also be seen that the whole of the working parts of the pump, with the exception of the basin and the parts immediately connected therewith, may be placed below the deck or platform of a ship, or other place, to which it is affixed; and that, in case of need, the parts of one pump may be interchanged with those of another; and, further, that when employing these improved pumps in pairs, as is usual on board ship, it is not necessary to form the same right and left handed, as the nozzles and spouts being central, as well as the cylinders B, they can be readily connected with the operating-lever, and the means of conducting away the water or liquid raised.

In place of cylinders B D E being arranged in a triangle, they may be placed in a line with the cylinder B, in the center.

It will be readily seen, by persons acquainted with the action of pumps, that the piston b^6 being set in motion by means of the rod b^1 , water will be alternately drawing into the cylinder B, on the upper and lower sides of the same, from the pipe H through the ports d e and valves d^1 e^1 , and will be forced out through the valves d^2 e^2 into the basin F, from which it will flow away by the nozzle or spout C.

Having thus described this invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination, with the casing A, formed with a main or piston cylinder, a pair of valve-cylinders, DE, and a basin, F, having

a central nozzle, C, all cast in one piece and provided with studs b^3 , as described, of the stay b^2 , provided with a bearing for the piston-rod b^1 , and vertical projections b^5 for retaining the cap or cover b in position, substantially as set forth.

2. The piston-cylinder B and its head b , in combination with the projections b^5 of the bridge-piece b^2 , substantially as and for the purpose specified.

FRANCIS CURTIS.

EDWARD P. RUSSELL.

Witnesses:

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