(No Model.)

2 Sheets—Sheet 1.

M. WATERS.

BILGE PUMP.

No. 324,438. Patented Aug. 18, 1885.

FIG. 1.

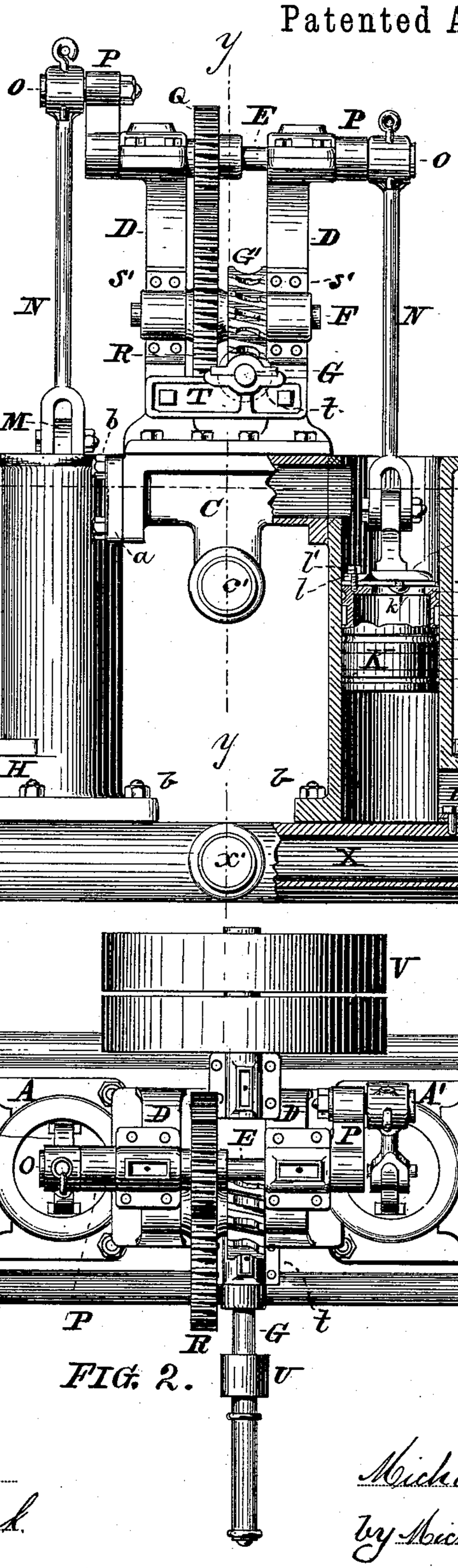

FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

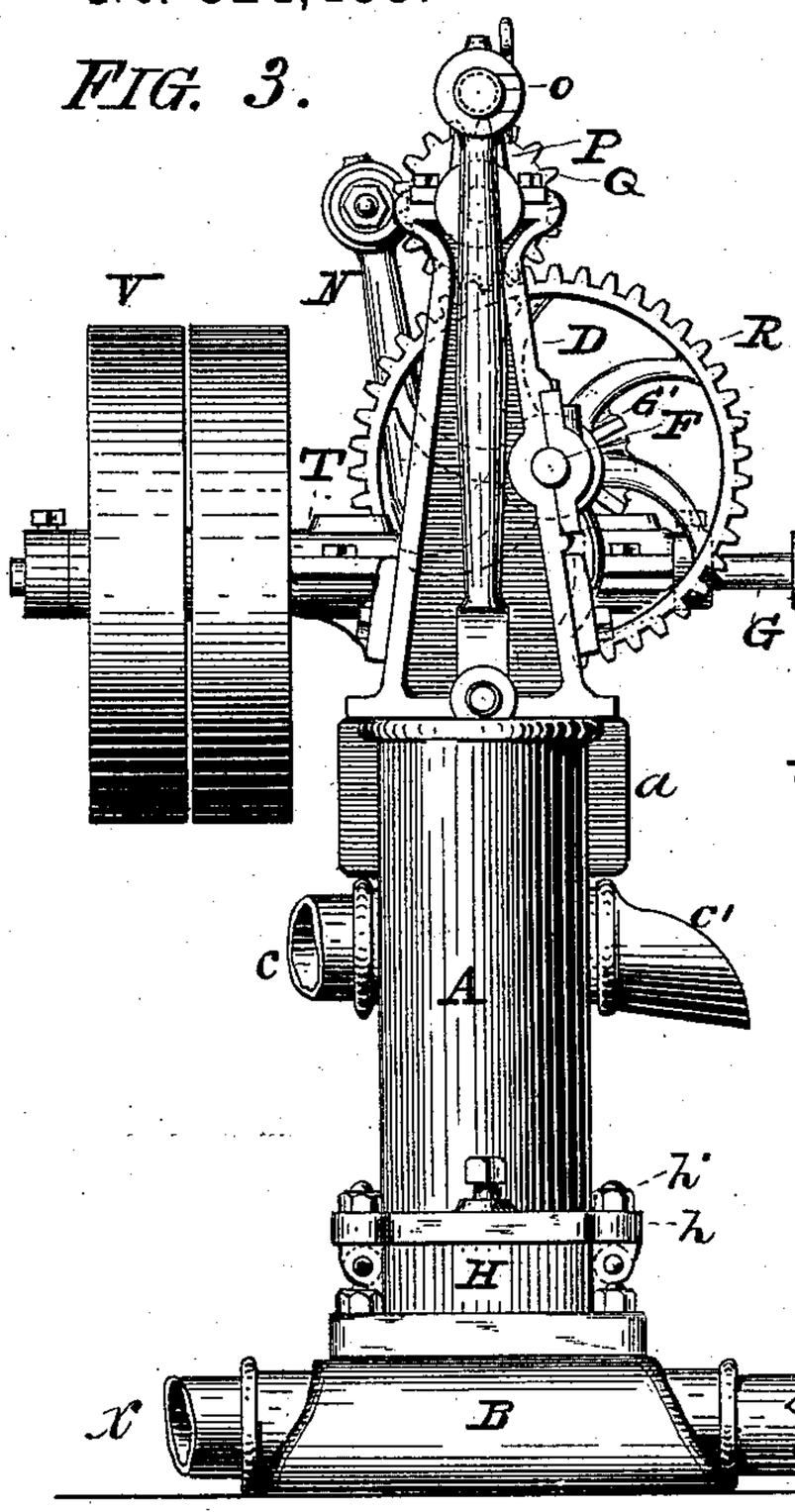


FIG. 4.

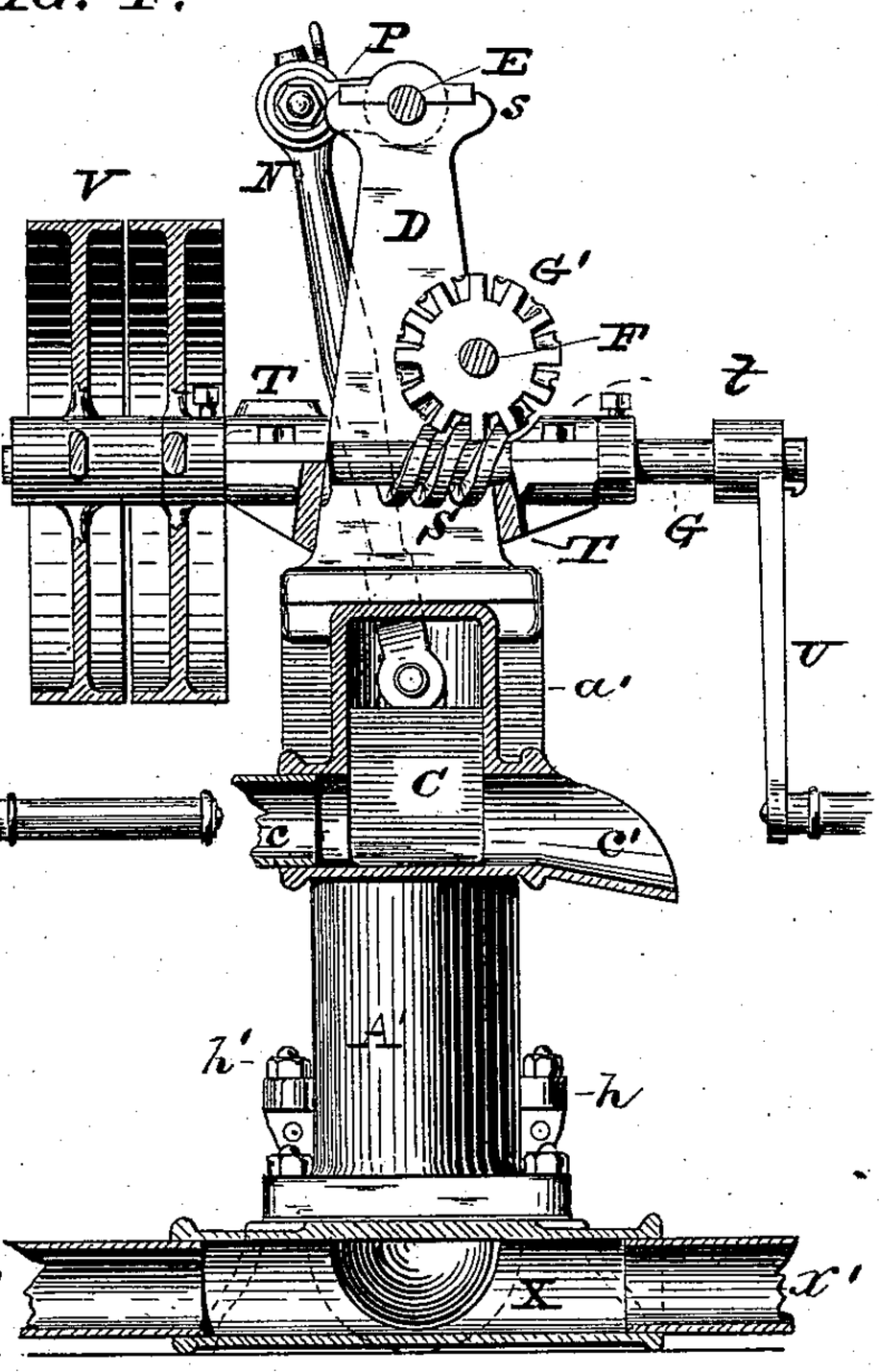
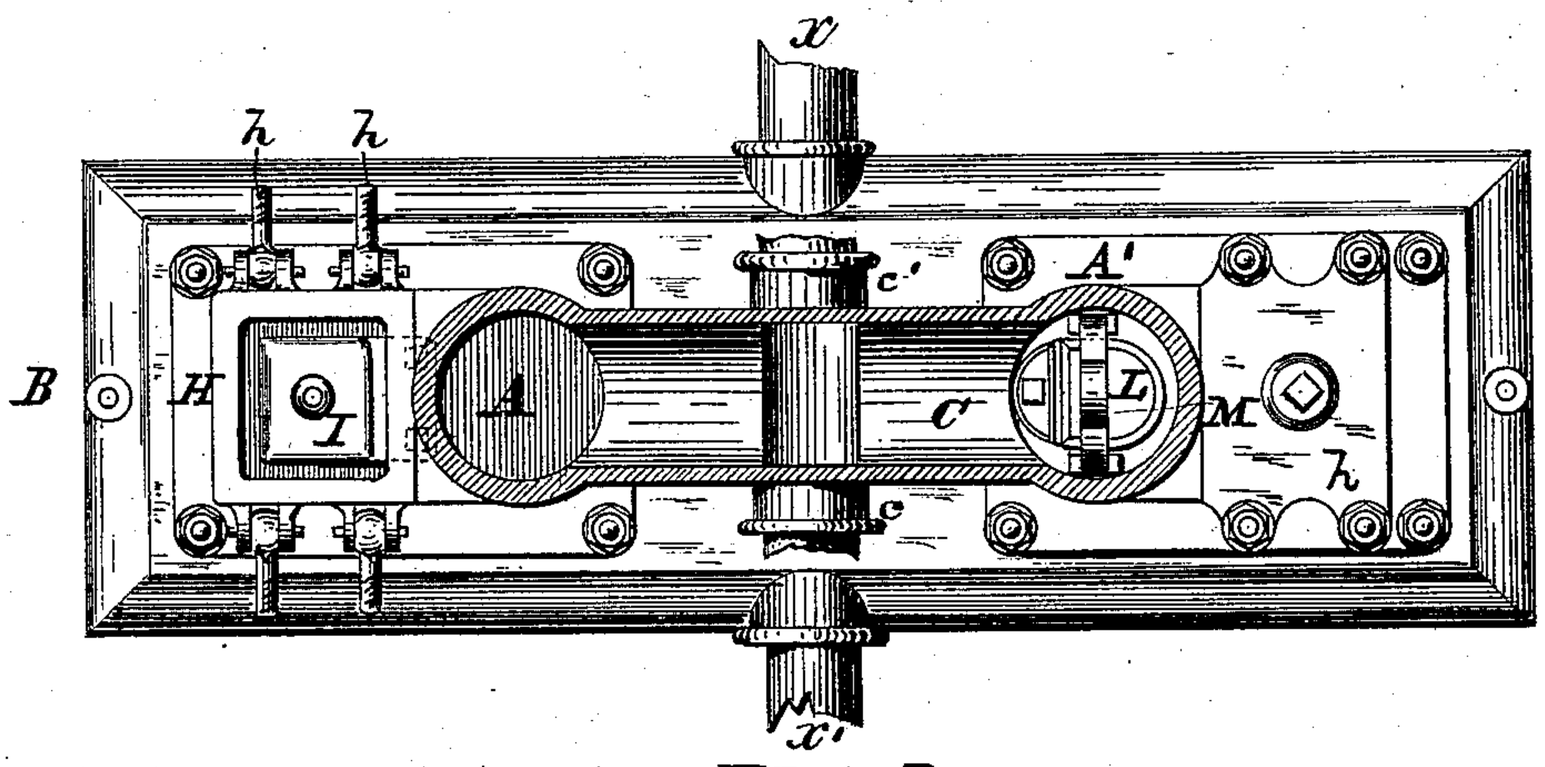


FIG. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

MICHAEL WATERS, OF BUFFALO, NEW YORK.

BILGE-PUMP.

SPECIFICATION forming part of Letters Patent No. 324,438, dated August 18, 1885.

Application filed July 6, 1885. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL WATERS, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Bilge-Pumps; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheets of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

My present invention has general reference to improvements in bilge and other pumps; and it consists, essentially, in the novel and peculiar combination of parts and details of construction, as hereinafter first fully set forth and described, and then pointed out in the claims.

In the drawings already referred to, which serve to illustrate my said invention more fully, Figure 1 is a side elevation of my improved pump, parts being in section. Fig. 2 is a plan of the same. Fig. 3 is an end elevation, and Fig. 4 a sectional elevation, in line *y y* of Fig. 1. Fig. 5 is a sectional plan in line *x x* of said Fig. 1.

Like parts are designated by corresponding letters of reference in all the figures.

The object of my present invention is the production of a simple, strong, durable, and efficient bilge-pump for vessel use, wrecking purposes, &c.; and to attain this end I construct my pump, essentially, of two pump-cylinders, A A′, screwed upon a suitable foundation or bed plate, B, by means of screws or bolts *b*. Each of these cylinders, which are open on their upper ends, have near their upper ends a flange, *a a′*, to which is secured a connecting-piece, C, forming a discharge-duct for the pump and at the same time a base for two standards, D, carrying the main crank-shaft E, the counter-shaft F, and a worm-wheel shaft, G, which shafts and suitable gear mechanism, hereinafter mentioned, serve to give motion to the pumping apparatus.

On the lower ends of the cylinders A A′ are valve-chests H, provided with removable covers *h*, securely held in position by means of pivoted screw-bolts *h′* in the well-known manner, as clearly illustrated in the drawings.

Upon the base-plate B, inside of the valve-chests H, are placed the suction-valves I, which valves are preferably constructed of leather disks having metallic plates, the disks being fastened to the base-plate by means of bolts *i* and fastening-plates *i′*, as fully illustrated in Figs. 1 and 5.

In the pump-cylinders are located pistons K, consisting each of hollow metallic cylinders having in their upper ends heads *k*, provided with a passage, *k′*, controlled by discharge-valves L, constructed substantially like the suction-valves I, and secured to the pistons by means of plates *l* and screws *l′*. In the periphery of the piston are provided metallic packing-rings *m* and grooves *n*, the latter forming a so called "water-packing," in the usual manner. The pistons K have yokes M, to which are pivoted connecting-rods N, which in turn are journaled to the wrist-pins O of the cranks P, affixed to the outer ends of the crank-shaft E, and set at right angles to or opposite each other, if desired.

Upon the crank-shaft E is placed a pinion, Q, which meshes with a gear-wheel, R, placed upon the counter-shaft F, together with a worm-wheel, G′, said shaft F having its bearings in boxes *s′*, formed in the sides of the standards D, and being operated by a worm, G′, formed in one piece with or attached to the worm-shaft G. This shaft revolves in boxes *t* on the connecting-pieces T, secured to the edges of the standards D. It is rotated either by means of a crank, U, or by driving-pulleys V, in an obvious manner.

Below the base-plate B of the pump is formed a suction-duct, X, preferably cast in one piece with said base-plate, and provided with two branches, *x x′*, so as to take the suction from different points. So has the connecting-duct C two branches, *c c′*, to enable the discharge in different directions, said discharges being either pipes or spouts, as illustrated in the various figures.

In operation the worm G′, engaging the worm-wheel S, causes the rotation of the spur-wheel R, which in turn actuates the gear-wheel Q, which, revolving the shaft E, operates the pump in an obvious manner.

It will be readily observed that owing to the peculiar construction of the parts and the ease with which each may be disconnected and re-

placed, one of the pumps may be operated while the parts of the other may be undergoing repairs, which, in case of an obstruction having got into the valve-chambers, &c., is quite an essential point in this pump. To reach the suction valve but four nuts need be turned to swing the pivoted bolts *h'* over, when the covers *h* may be instantly removed and the said valve I disclosed. It will be further observed that this pump mechanism, consisting of the worm and worm-wheel and spur-wheel and pinion, may be readily applied to force and other pumps without change or modification. The worm S is shown as constructed with but a single "thread." It may, however, be made with any number of threads to suit the convenience of the constructor.

On account of the peculiar construction of the separate pump-cylinders with connecting-duct, separate uprights and cross-pieces for the bearings of the worm-shaft, any part wearing out or breaking from any cause whatever may be readily and easily replaced, so that repairs may be made at short notice, and thereby much valuable time saved in cases of emergency.

Having thus fully described my invention, I claim as new and desire to secure to me by Letters Patent of the United States—

1. The combination, with the bed-piece and pump-cylinders, of the connecting-duct C, standards D, secured to and upon said connecting-piece C, connecting-brackets T, and the mechanism consisting of the worm G', worm-wheel S, shaft G, spur-wheel R, pinion Q, shaft E, with cranks P, and connecting-rods N, with pistons K, the whole being constructed and combined substantially as and for the object specified.

2. In bilge and other pumps, the combination, with the pump-cylinders, of two standards secured to or formed in one piece with the connecting discharge-duct, a worm-wheel mechanism, and the spur-wheel and pinion connection for giving motion to the crank-shaft, substantially in the manner as and for the object specified.

In testimony that I claim the foregoing as my invention I have hereto set my hand in the presence of two subscribing witnesses.

MICHAEL WATERS.

Attest:

MICHAEL J. STARK,

WILLIE O. STARK.