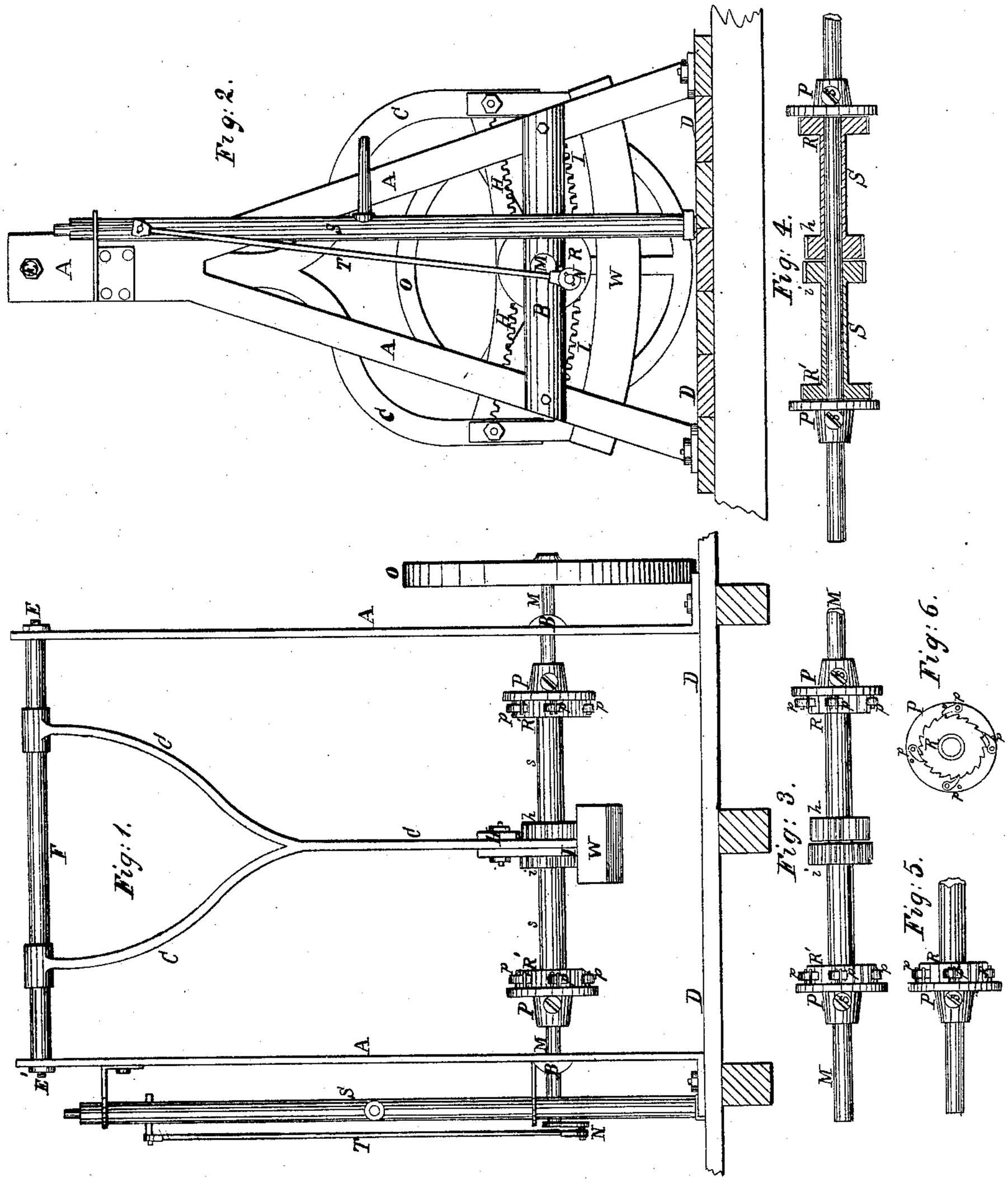
A. Cain,

Bilge Water Discharging.

No. 45,973. Patented Jan. 24, 1865.



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UNITED STATES PATENT OFFICE.

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IMPROVED MEANS FOR WORKING SHIPS' PUMPS.

Specification forming part of Letters Patent No. **45,973**, dated January 24, 1865.

To all whom it may concern:

Be it known that I, ANSEL CAIN, of Holyoke, in the county of Hampton and Commonwealth of Massachusetts, have invented a new and useful Improvement in the Method of Operating Ships' Pumps; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

In said drawings, Figure 1 is a front elevation; Fig. 2, an end elevation; Fig. 3, a front view of the main or pumping shaft, showing the gears and ratchet-wheels thereon. Fig. 4 is a transverse section of the same. Fig. 5 and 6 are respectively a front and end view of a single ratchet-wheel with the accompanying fixed wheel and the pawls thereon, similar letters referring to like parts in all the drawings.

The object of this invention is to free a ship or vessel from the water accumulating therein, from leakage or other causes, by causing the rocking or rolling of the vessel to actuate suitable pumping apparatus. To effect this, a heavy weight, oscillating freely within certain limits, carries two toothed segments, each of which operates a gear or toothed wheel, running on a sleeve upon the main shaft of the machine. By an arrangement of ratchet-wheels and pawls the reciprocating motion of the weight and segmental gears thereon imparts a continuous rotary motion to the main shaft, and a continuous action of the pumping apparatus is thereby obtained.

I am aware that the oscillation of a pendulum or weight, deriving its relative motion from the rocking or rolling of a vessel, has been employed to operate ships' pumps, as in the Letters Patent of Coates and Perry, No. 18,192, and I do not intend to claim as a novelty the actuating-power I employ, but the manner of utilizing the same, as hereinafter more fully set forth.

The construction and operation of my invention are as follows:

A frame-work, A A B, firmly bolted to the lower deck, D, or to a suitable platform, supports the rod E, upon which is the sleeve F. A rigid forked hanger, C, is attached to the sleeve F, and supports the weight W, and the toothed segments H and I. The cross-pieces B B in the frame-work support the main shaft M, to which are secured by set-screws the wheels P P, each carrying four pawls, *p p*, pivoted on its inner face. The gears *h* and *i* are rigidly connected with the ratchet-wheels R and R′, respectively, by intervening sleeves, and both turn loosely on the main shaft with their respective ratchet-wheels. The vibration of the weight produces a continuous rotary motion of the main shaft in the following manner: The toothed segments H and I are constantly engaged with the respective gears *h* and *i*, and as the segment H is toothed upon the convex face, and the segment I upon the concave face, the gears *h* and *i*, will be turned in opposite directions with every oscillation of the weight. The ratchet-wheels R R′ will move with the gears *h* and *i*, respectively, and will also be revolving in opposite directions. The teeth of both these ratchet-wheels incline in one direction, and it occurs that as the ratchet-wheels are revolving in opposite directions, whenever the weight oscillates the pawls *p p p p* on one or the other flange or fixed wheel P P will engage the teeth of its ratchet-wheel, and impart the motion of the corresponding gear to the main shaft, while the other gear-wheel will turn loosely upon the shaft. A fly-wheel, O, on one end of the shaft M insures regularity of motion, and a crank, N, on the other end, operates a pump, S, by the crank-rod T.

I do not confine myself to the method herein set forth of actuating a pump by means of a crank upon the main shaft, nor to the use of the pump herein shown, as the methods of applying the power and the forms of pumping apparatus used must be various.

Somd of the points of utility in my invention I conceive to be as follows: First, that it makes available an auxiliary power which has not been heretofore utilized to any extent for the purpose, and by its continuous and automatic action in sea-going vessels keeps them free from bilge-water without the use of manual labor; second, that as the power is taken from the pendulum at its lower part, and in the line of its most extended motion, every full oscillation produces more than one revolution of the pumping-shaft, and in a full-sized machine several revolutions, thereby facilitating the operation of pumping; third, that the main shaft may be turned by a winch or

other means in one direction, independently of the pendulum, so that the pumps may be operated by hand if necessary; fourth, that some suitable portion of the cargo may be attached to the forked hanger and serve as a pendulum, thereby avoiding the necessity of conveying extra weight.

The segmental gears may be placed on either side or above the frame-work, and be there actuated by the weight.

I do not claim, broadly, the use of the power derived from an oscillating pendulum as applied to pumping or other useful purpose, as the same is used in the invention of Coates and Perry, before mentioned, and in the invention of James Armstrong, Letters Patent No. 32,028; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

Operating the pumping apparatus of a ship or vessel by means of an oscillating weight, in combination with the mechanism described, the whole arranged substantially as set forth.

ANSEL CAIN.

Witnesses:

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