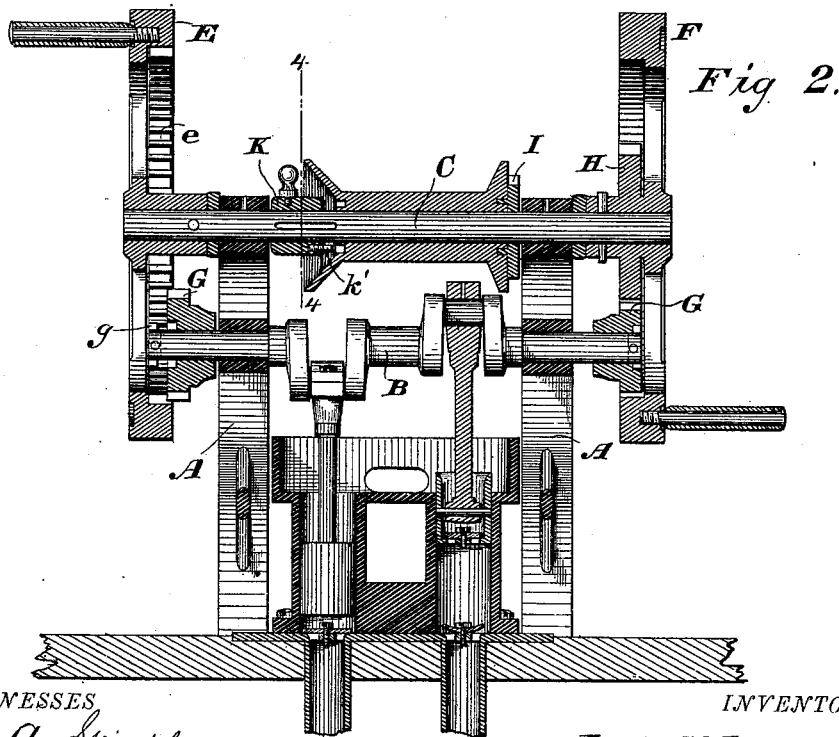
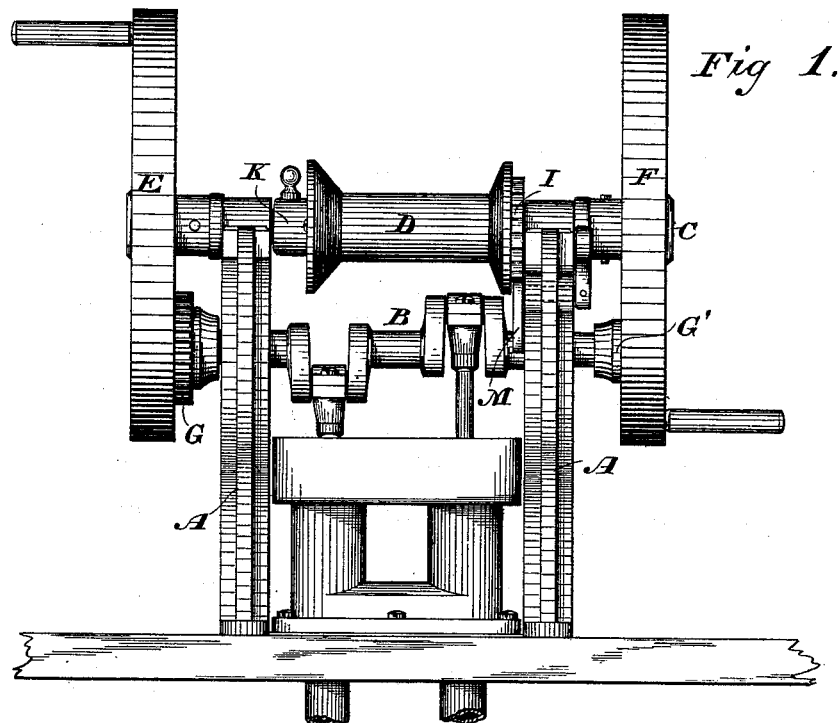


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 Combined Ship's Pump and Windlass.
 No. 218,448. Patented Aug. 12, 1879.



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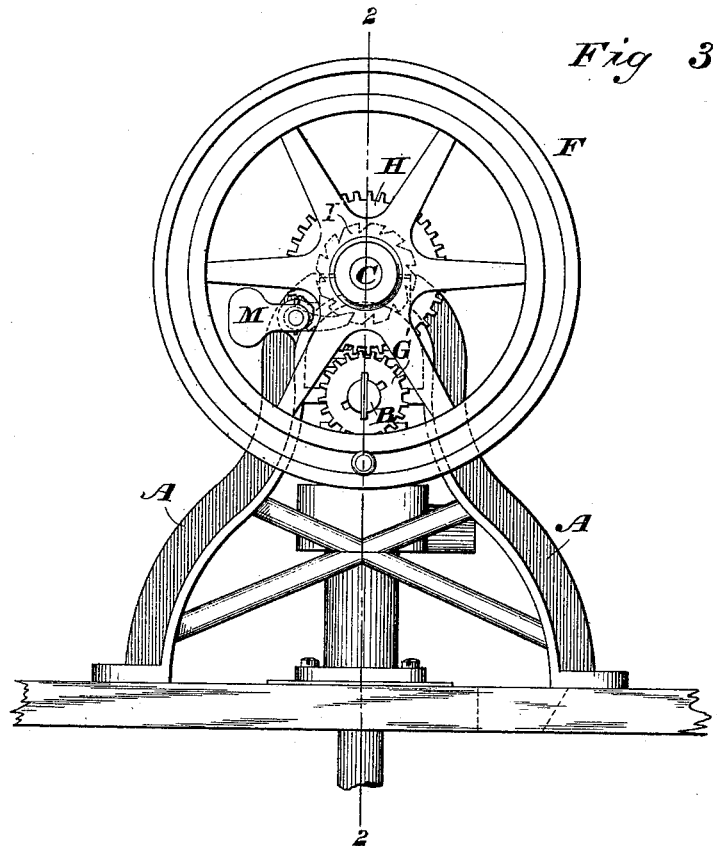
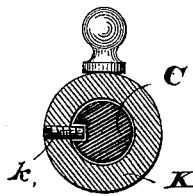


Fig 4



WITNESSES

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UNITED STATES PATENT OFFICE.

LOUIS H. LYON, OF BRIDGEPORT, CONNECTICUT.

IMPROVEMENT IN COMBINED SHIP'S PUMP AND WINDLASS.

Specification forming part of Letters Patent No. **218,448**, dated August 12, 1879; application filed March 7, 1879.

To all whom it may concern:

Be it known that I, LOUIS H. LYON, of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Combined Ship's Pump and Windlass, of which the following is a specification.

This invention is an improvement upon that patented to me August 6, 1878, No. 206,805, and, like that, relates to raising and lowering apparatus for use on vessels, and is adapted for operating the pumps, for raising and lowering sail, for handling the cargo, &c.

My object is to provide for varying the speed of operation of the pumps, for connecting and disconnecting the winding-drum and the driving-shaft, for locking the drum so as to prevent its rotation in one direction at will, and for rotating the driving-shaft so as to work either the drum or the pumps alone, or both together, or neither of them, as desired.

In the accompanying drawings, which illustrate my improvements, Figure 1 is a side elevation of my apparatus. Fig. 2 is a vertical section on the line 2 2 of Fig. 3. Fig. 3 is an end elevation, and Fig. 4 is a section on the line 4 4 of Fig. 2.

A indicates the frame-work, which rests on the deck, and supports the pump or crank shaft B, and above it the main driving-shaft C, carrying the hoisting-drum D and the driving-wheels E and F. The wheel E is internally cogged at *e*, so as to gear with the shifting pinion G of the crank-shaft, and drive it and operate the pumps. As the difference in size between the wheel E and pinion G is very great, when they are geared together so as to drive the crank-shaft, the pumps are operated very rapidly.

When it is not desirable to work the pumps with so much rapidity, the pinion G is disconnected from its cross-head *g*, or other clutching appliance, and slid inward somewhat, but not so as to ungear it from the wheel E, in which position it will run loosely on the crank-shaft. At the same time the shifting pinion G' on the opposite end of the crank-shaft, which gears with the spur-wheel H on the driving-shaft, is slid outward and connected with its cross-head, which connects it rigidly with the crank-shaft.

The machine being operated in this condition of the gearing will drive the pumps more slowly, as the difference in size between the pinion G' and the wheel H is less than the difference between the pinion G and the driving-wheel E.

When it is desired that the pumps shall remain at rest, and the machine be operated to work the winding-drum only, the pinions G and G' are both slid inward, which releases their rigid connection with the crank-shaft, and permits them to run loosely on the same.

The winding-drum D is loose on the driving-shaft, and may be rigidly connected to it by means of a sliding sleeve, K, having a set-screw, *k*, which fits into a longitudinal groove in the shaft. This sleeve is provided with one or more pins, *k'*, which fit into corresponding recesses in the adjacent end of the winding-drum.

The connection and disconnection of the drum are accomplished by simply sliding the sleeve a little distance to and fro on the driving-shaft.

The opposite end of the drum is provided with a ratchet, I, with which a weighted pawl, M, engages by its gravity. This pawl may be tilted so as to disengage from the ratchet and permit the winding-drum to revolve in either direction, when that is desirable; or it will, when in its normal position of engagement with the ratchet, prevent the revolution of the winding-drum in one direction.

From the foregoing description of the construction and arrangement of the several parts it will be perceived that both the drum and crank-shaft may be so thrown out of gear that the driving wheels and shaft may be operated without moving either. This will be convenient when, for instance, it is not desired to work the pumps, and when a weight is suspended from the drum and held by the pawl and ratchet, to prevent the accidental revolution of the drum; and, again, it will be convenient to throw the drum out of gear or rigid connection with the shaft while the latter is being driven, and without the necessity of stopping its operation.

When it is desired to work the pumps it is also convenient sometimes to operate the windlass, and then to stop it without stopping the

main driving-shaft, and this can readily be done.

My apparatus is therefore capable of various adjustments, that render it desirable and efficient at all times and under all conditions for the different functions to which such a machine is adapted on shipboard.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the crank-shaft, the shifting pinions on its opposite ends, with means for rigidly or loosely connecting them to the shaft at will, and the driving-wheel E and wheel H, whereby different speeds of operation are attained for the pumps, substantially as described.

2. The combination of the crank shaft and its adjustable gearing for the attainment of different speeds, and for throwing the crank-shaft out of operation entirely at will, with the main driving-shaft and winding-drum, and their connecting and disconnecting mech-

anism, whereby either the winding-drum or crank-shaft may be worked, or both hoisting and pumping may be simultaneously accomplished, or both may be stopped or prevented, without stopping the operation of the driving-shaft and its driving-wheels, substantially as described.

3. In a combined ship's pump and windlass, the combination of a driving-shaft and winding-drum, and mechanism for throwing the drum into and out of operation with a pump-crank shaft, and adjustable gearing between the driving-wheel and crank-shaft, whereby the latter may be worked or remain at rest during the operation of the drum, or when the drum is at rest, substantially as described.

In testimony whereof I have hereunto subscribed my name.

LOUIS H. LYON.

Witnesses:

MORRIS B. BEARDSLEY,
FRANK T. BOTSFORD.