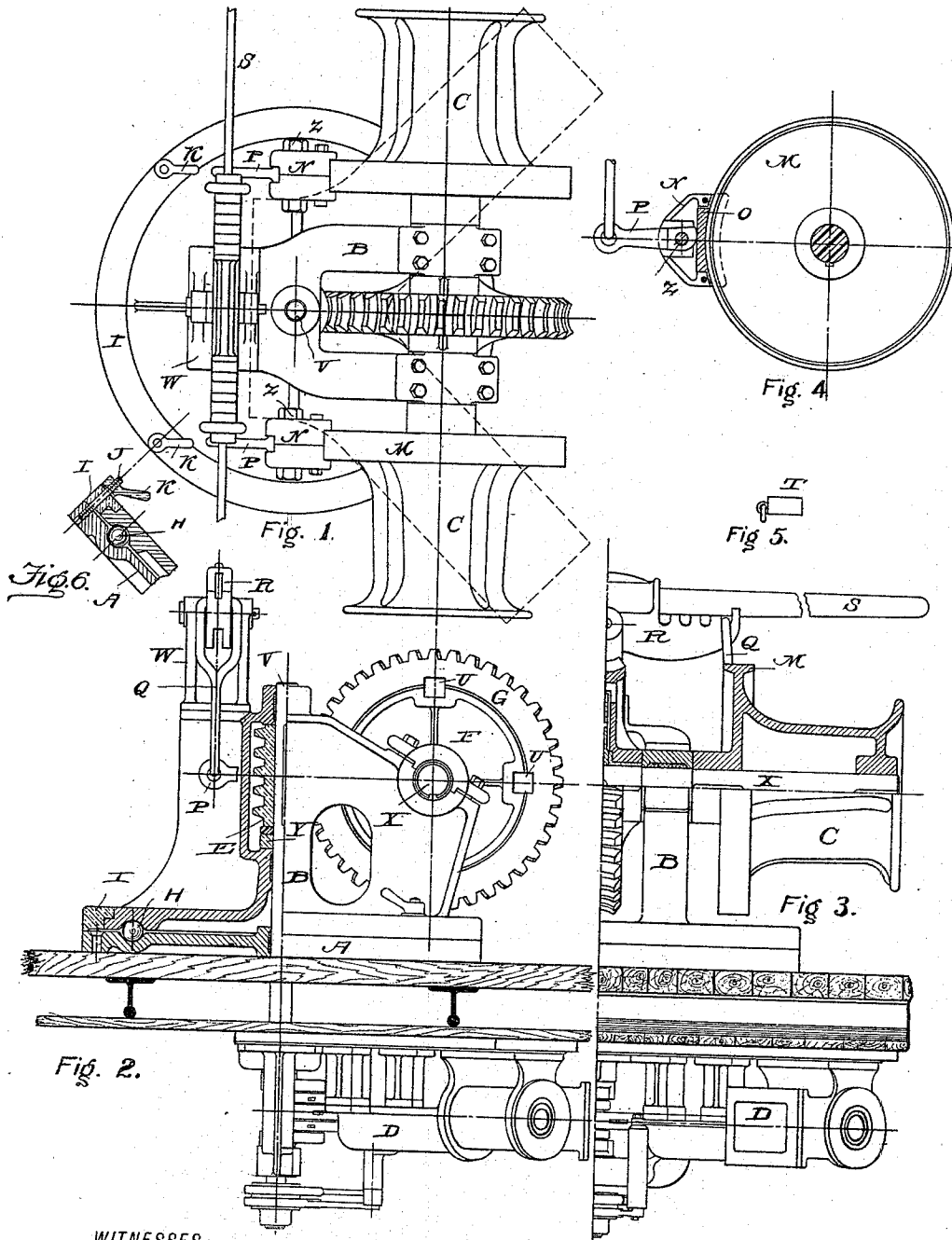


(No Model.)

F. B. GRATER.
HOISTING WINCH.

No. 573,326.

Patented Dec. 15, 1896.



WITNESSES:

H. J. Bernhart
Wm. D. Ashlee

INVENTOR

Frank B. Grater.

BY

Edson Bros.

ATTORNEYS

UNITED STATES PATENT OFFICE.

FRANK B. GRATER, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE
AMERICAN SHIP WINDLASS COMPANY, OF SAME PLACE.

HOISTING-WINCH.

SPECIFICATION forming part of Letters Patent No. 573,326, dated December 15, 1896.

Application filed March 9, 1896. Serial No. 582,432. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. GRATER, of Providence, in the county of Providence and State of Rhode Island, have made an invention of certain new and useful Improvements in Hoisting-Winches; and I do hereby declare that the following, in connection with the accompanying drawings, is a full, clear, and exact description and specification of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that class of winches which are provided with revolving horizontal rope-drums or gipsy-heads. These winches have hitherto been restricted in their use to cases where the hoisting-rope could be led off in a vertical plane approximately at right angles to the line of the drum-shaft. For certain situations that is all that is required, but there are many conditions, especially on shipboard, where it is desirable to lead the ropes off in various directions, and a snatch-block is cumbersome and in the way, troublesome often to fit up, and involves much waste of time.

The object of my invention is to provide means by which the position or direction of winch-shaft may be altered, so that the ropes may be led off in any desired direction, and this I accomplish by mounting the whole winch upon a turn-table and rotating it about the motive shaft as an axis and securing it in any desired position.

My invention may be embodied in various forms, as circumstances or the views of different constructors or users render expedient; but in order that it may be fully understood I have represented in the accompanying drawings and will proceed to describe the best form in which I have thus far embodied it for practical use.

Figure 1 represents a plan of a hoisting-winch embodying my invention. Fig. 2 is a side elevation, partly in section, of the winch. Fig. 3 is a half-section and half front elevation of the winch. Figs. 4, 5, and 6 represent details of the construction, as herein after explained.

The winch-heads C are mounted upon the shaft X, and I have preferred to show them

keyed firmly upon it, although it is evident that this and other constructive details are immaterial to my invention. The bit B is made in two branches joined together to form bearings for the upright shaft *v* and extended at the base into a circular foot grooved on the lower side to form a bearing resting on balls H, which in turn rest upon and are free to roll within a circular groove in the base A. These balls H, I prefer to make of steel or of chilled cast-iron, ground to a true sphere, and the grooves in the base A and bit-casting B may be machine-turned or preferably cast upon a chill.

For applying power to my winch I prefer to use a worm E and worm-gear G, the worm keyed to the vertical shaft V and thrust-washers inserted at Y to take up the wear and reduce the friction. The worm-shaft V is extended below the decks and power applied to it. The motor which I prefer to use and have shown upon the accompanying drawings at D is a steam-engine with two steam-cylinders at right angles to each other, with reciprocating pistons and connecting-rods applied to the same throw of the crank or worm shaft V.

It may sometimes be desirable to use this winch by hand-power, and I have therefore provided for this by using the well-known form of pump brake-wheel, beam, and connections. The clamp-wheels M are in this case cast upon the gipsy-heads C. The clamps N inclose a portion of the periphery of the wheels M and fit loosely upon them. A toggle P, hung eccentrically upon a bolt Z, bears upon a loose shoe O, which plays upon the outer surface of the wheels M. Motion is given to these toggles P by means of the toggle connections Q, beam R, and brake-levers S. The beam R is mounted on a removable beam-stand W. This toggle and clamp motion is of course not claimed as new, and it is too well known to require further description, but I have chosen to use it on my winch because it is the best which I have yet found for the purpose.

To enable the winch to be used by hand, it is necessary to disconnect the worm-gear in some way, as otherwise the worm will prevent the rotation of the shaft. For this purpose I have mounted the worm-gear G loosely upon

the shaft X, as shown clearly in the section in Fig. 3. A worm-wheel driving-head F is securely keyed to the shaft X, and the connection between the worm-wheel G and the shaft may be made or broken at will by inserting or removing the block-key T in the pockets U, which are cast in the worm-wheel G and the driving-head F.

The essential part of my invention does not lie in the details hereinbefore described, but in the idea of the mounting of the winch upon a turn-table and rotating it about a central vertical axis. A convenient method of locking the winch in the desired position will now be described, but the invention is not restricted to any particular means for locking the turn-table. The said method is by a ring and hand-clamps. The base A is bolted to the deck. A number of studs J are screwed into the base A and allowed to stick up from it. The winch is set in place and may be rotated freely upon the ball-bearings. A metal ring I is then dropped down over it, having holes in it through which the studs J pass. The winch may now be rotated as before, but by clamping the ring I down hard by means of the hand-nuts K the winch may be held firmly in any desired position. It is evident that by the omission of the worm-shaft and worm-wheel this winch would become a simple hand-winch, and similarly by the omission of the pump-brake mechanism the winch would be capable of operation by power applied to the worm-shaft, but not by hand.

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

1. In a winch, a base-plate, a bit or framing provided with a foot which is supported on said base-plate by rolling bearings, and an annular clamp constructed to engage with said foot and hold the bit or framing in position, combined with a drum-carrying shaft mounted on said bit or framing, and means for rotating said drum-shaft, substantially as and for the purposes described.

2. In a winch, the combination of a rotatable bit or framing, a power-shaft passing loosely through said bit or framing to rotate freely therein and to serve as an axis for said framing when it is desired to turn the same horizontally, a drum-shaft journaled on the bit or framing and carrying one or more drums which are movable with the framing or bit to face in any desired direction, and gearing substantially such as described to operatively connect the drum-shaft with the power-shaft and permit the framing, drum-shaft and drums to be adjusted horizontally without disconnecting the drum-shaft from the power-shaft, as set forth.

3. In a winch, a rotatable bit or framing, an annular adjustable clamp embracing the foot of said bit or framing to hold the same fixedly in its adjusted position, and a power-shaft passing freely through framing to rotate therein without affecting the same and

serving as a vertical axis to the framing when the latter is horizontally turned to face in the desired direction, combined with one or more drums carried by said framing, and adjustable therewith, to face in the desired direction, and gearing for connecting said power-shaft and the drum or drums, as set forth.

4. In a winch, a rotatable bit or framing, and a power-shaft which passes freely through said bit or framing to rotate therein without affecting the position of the same and serving as a center for the horizontal adjustment of said framing, in combination with a drum-carrying shaft journaled on said framing and adjustable therewith to have its drum or drums face in the desired direction, a worm on the power-shaft, and a worm-gear on the drum-carrying shaft, whereby said bit or framing may be turned horizontally without breaking the connection between the power-shaft and the drum-carrying shaft, as and for the purposes set forth.

5. In combination, a rotatable bit or framing, an annular clamp engaging the foot of said bit or framing, a power-shaft arranged to serve as a center of adjustment for said bit or framing, a drum or drums carried by said bit or framing, a worm on said power-shaft, and a worm-gear on the drum-shaft arranged to mesh with said worm on the power-shaft, for the purposes described, substantially as set forth.

6. In a winch, the combination of a rotatable bit or framing mounted to turn as on a vertical axis, an annular clamp arranged to engage with the foot of said bit or framing and having means for holding the clamp and framing in a fixed position, a drum-carrying shaft journaled on the bit or framing and adjustable with the same to have the drum or drums thereon face in the desired direction, and a hand-power mechanism carried by and adjustable with said bit or framing to always preserve the same relation to the drum or drums and operatively connected with the latter as and for the purposes described.

7. In combination, a vertical power-shaft, means for driving the same, a rotatable bit or framing fitted loosely on said power-shaft, a clamp engaging with said bit or framing, a drum-shaft journaled on the bit or framing and carrying a drum or drums, gearing such as described which connects the drum-shaft to the power-shaft and permits adjustment of the bit or framing and drum-shaft in a horizontal plane without uncoupling the drum-shaft from said power-shaft, means for throwing such gearing into and out of operative relation to the drum-shaft, and a hand-power mechanism carried by the adjustable framing and engaging with the drum-shaft, as and for the purposes set forth.

8. In a winch, the bit or framing bifurcated to provide the spaced jaws and having a stem with a vertical opening in a plane between said jaws, combined with a power-shaft passing loosely through said vertical opening in

the bit or framing and serving as a vertical
axis therefor, a horizontal drum-shaft jour-
naled in bearings on the jaws of the bit or
framing, and gearing substantially such as
5 described for operatively connecting the
drum-shaft and power-shaft, and arranged to
permit adjustment of the bit or framing and
drum-shaft in a horizontal plane without dis-
turbance the operative connection between the

power-shaft and drum-shaft, as and for the
purposes described.

In testimony whereof I affix my signature
in presence of two witnesses.

FRANK B. GRATER.

Witnesses:

GILMAN E. JOPP,
EDWIN C. POTTER.