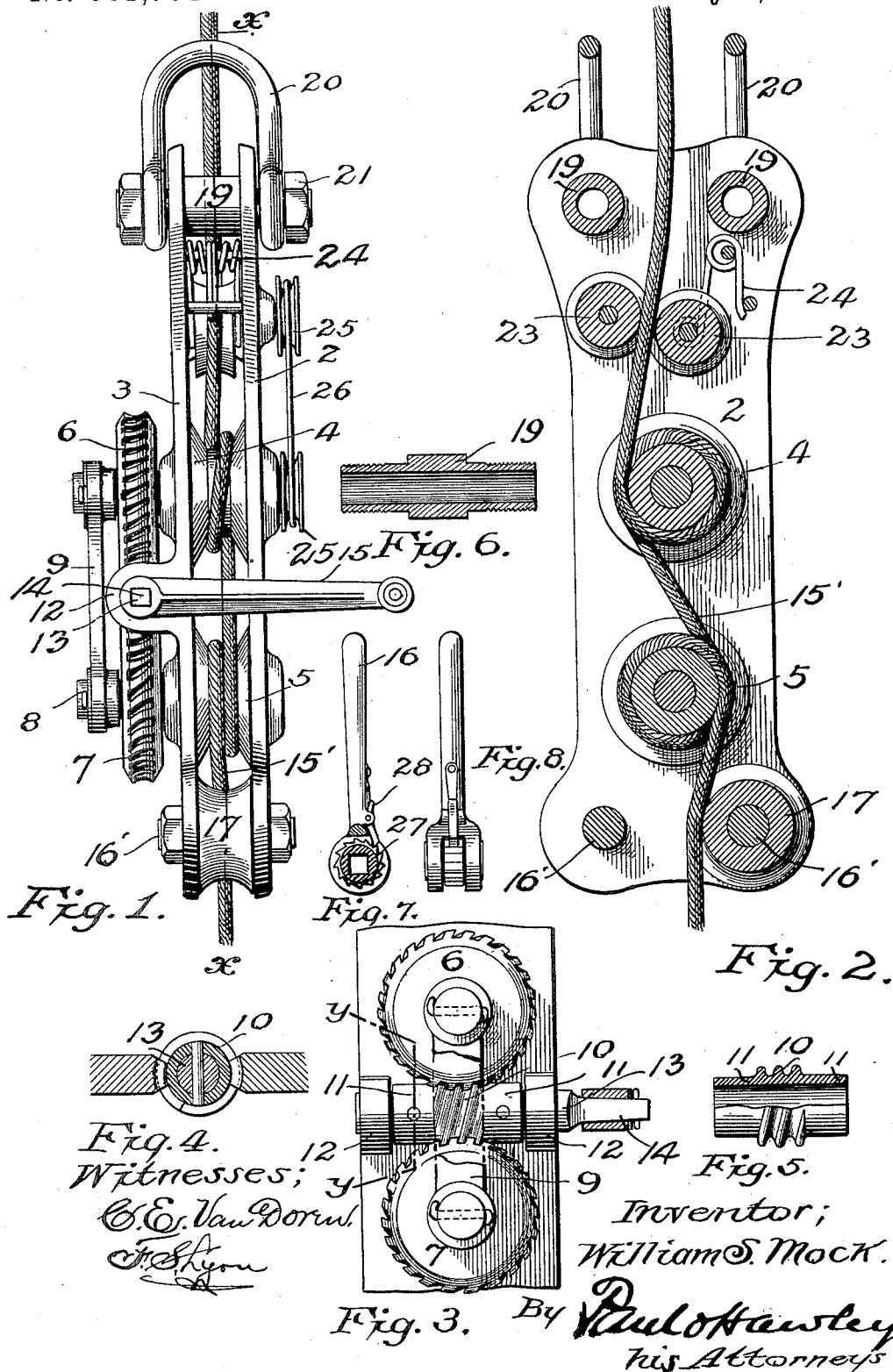


(No Model.)

W. S. MOCK.
HOISTING MACHINE.

No. 581,754.

Patented May 4, 1897.



UNITED STATES PATENT OFFICE.

WILLIAM S. MOCK, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR OF ONE-HALF
TO SAMUEL M. HAUSER, OF SAME PLACE.

HOISTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 581,754, dated May 4, 1897.

Application filed March 12, 1895. Serial No. 541,409. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. MOCK, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Hoisting-Machines, of which the following is a specification.

My invention relates to a hoisting device employed as a hand-power.

The object of my invention is to provide a device whereby a person may lift or move a very heavy weight with comparatively little exertion.

A further object of my invention is to provide a hoisting device which may be readily secured in any place, and, further, a hoisting device which may be applied at any point on a draft rope or cable, the same having means for taking up the slack in a rope upon the free side of the device.

To these ends my invention consists generally in a hoisting device of the construction hereinafter described, and particularly pointed out in the claims.

The invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a vertical elevation of a hoisting device embodying my invention. Fig. 2 is a sectional view thereof on the line $x x$ of Fig. 1. Fig. 3 is a side view showing the worm-gears. Fig. 4 is a partial sectional view thereof on the line $y y$ of Fig. 3. Fig. 5 is a detail sectional view of the worm-gear employed. Fig. 6 is a sectional view of one of the hollow bolts used at the upper end of the device. Figs. 7 and 8 are detail views of the reversible ratchet which I prefer to employ for turning the worm.

As shown in the drawings, 2 and 3 represent the side plates, between which the winding-wheels 4 and 5 are arranged. These wheels are preferably grooved, as shown, and have the slanting sides to compel the rope to seek the center part of the pulleys or wheels, and the pulleys are secured firmly upon shafts which extend through the sides of the plates 2 and 3, and each provided with a worm gear-wheel 6 and 7. Furthermore, the outer ends 8 of these shafts are preferably tied together by a strap 9 to prevent their spreading.

Between the two gear-wheels 6 and 7 I provide the worm 10, having the hubs 11, which completely fill the space between the bearing-lugs 12, and secured upon a shaft 13, extending through the lugs. The outer end of the shaft preferably has a square end 14 to receive either a crank 15 or preferably a ratchet 16. The worm meshes with both gears 6 7, and, as is obvious, rotates the same in opposite directions. Therefore the rope or cable 15 is wound in opposite directions about the winding-wheels 4 5, being crossed diagonally between the wheels in order that the rope may be carried in the same direction on both wheels. The rope enters between the spreader-bolts 16' at the lower end of the plates, and one of the bolts preferably carries a guide pulley or sleeve 17 in order to prevent wear on the rope.

At the opposite ends the plates are held apart by the bolts 19, having the enlarged center parts between the two plates and the threaded outer end to receive the clips or yokes 20 and the fastening-nuts 21. These bolts are made hollow in order that a short piece or bar of iron may be inserted through them and by which the person using the device may hold it steady while he turns the crank or operates the ratchet-lever. Between these and the upper wheel 4 I preferably arrange the take-up or pressure rolls or pulleys 23, springs 24 being provided in connection with one of the same in order to force the rolls toward one another and grip the rope between them. The shaft of one of the rolls extends through one side of the plate, and this shaft and the shaft of the winding-wheel 4 are provided with small pulleys 25 to receive a belt 26, whereby the pressure-rolls are driven at the same or slightly-increased speed as the winding-wheel 4, thereby drawing the rope steadily away from the wheel or pulley 4 and holding the rope tightly about the same, so that the full grip of the rope upon both pulleys is secured.

The ratchet device comprises the handle 16, the end of which is the sleeve 27, having a square hole to admit the end of the shaft 13, and this sleeve is provided with a ratchet to be engaged by a spring-pawl 28 on the handle part. By simply reversing the position of

the ratchet upon the shaft the ratchet may be made to operate in an opposite direction. This reversed movement is necessary, as the device is often used for lowering heavy articles as well as for raising the same.

In use the device is secured to a fixed post or other object by ropes extending from the yokes or clips 20. Then the lifting cable or rope is threaded through and around the winding-wheels and then carried through the pressure-rolls and drawn taut, after which the device is ready for immediate use. The grip of the rope upon the two winding-wheels, and particularly the crossed relation of the parts 15 of the rope upon the winding wheels or pulleys which insures the tight grip of the rope thereon, enables the transmission of a very heavy power from a simple crank or lever. Further, it is obvious that the worm will lock 20 the gear-wheels, and thus the winding-wheels, in any position, it being necessary to turn the worm in order to draw the rope in or allow it to be drawn out of the device.

Further advantages of my device lie in its compactness, its strength, and its durability.

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

1. The combination, with the side plates, of the winding-wheels provided between them, the shafts of said wheels extending through said plates, the worm gear-wheels provided upon said shafts opposite one another, a transverse shaft carrying a worm to mesh with both said gear-wheels, bearings upon the said plate for said transverse shaft, the pressure-rolls provided between said plates, means for driving said rolls from one of said winding-wheels, and means for securing the whole device in place, substantially as described.

2. The combination, with the side plates, of the winding-wheels provided between them, the shafts of said wheels extending through said plates, the worm gear-wheels provided upon said shafts opposite one another, the transverse shaft carrying a worm to mesh with both said gear-wheels, bearings upon the side plate for said transverse shaft, the pressure-rolls provided between said plates, means for driving said rolls from one of said winding-wheels, and one or more loops or yokes provided on the upper end of said plates and

whereby the device may be fastened as desired, substantially as described.

3. The combination, with the side plates, of the winding-wheels provided between them, the shafts of said wheels extending through said plates, the worm gear-wheels provided upon said shafts opposite one another, the transverse shaft carrying a worm to mesh with both said gear-wheels, bearings upon the side plate for said transverse shaft, the pressure-rolls provided between said plates, means for driving said rolls from one of said winding-wheels, and one or more loops or yokes provided on the upper end of said plates and whereby the device may be fastened as desired, and the upper ends of said plates being provided with an opening or openings through which a bar may be inserted to hold the device securely while said worm-shaft is being turned, substantially as described.

4. The combination, with the side plates, of the winding-wheels provided between them, the shafts of said wheels extending through said plates and provided with worm gear-wheels, a transverse worm-shaft extending between said worm-wheels and carrying a worm to mesh therewith, a ratchet device for operating said transverse shaft, and take-up means provided between said plates, substantially as described.

5. In a device of the class described, the combination with the side plates, of the winding-wheels arranged between them, the parallel shafts of said wheels, the worm gear-wheels upon said shafts, the transverse shaft carried by one of said plates and provided with a worm meshing with both of said gear-wheels, means for revolving said worm to turn said winding-wheels in opposite directions, whereby the free end of a rope passed around said winding-wheels may be advanced through the device as said wheels are turned, and means for taking up the slack in the free end of the rope, substantially as described.

In testimony whereof I have hereunto set my hand this 27th day of February, A. D. 1895.

WILLIAM S. MOCK.

In presence of—

C. G. HAWLEY,
F. S. LYON.