

J. EWIG & F. KATTLER.
PORTABLE CRANE.
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1,284,277.

Patented Nov. 12, 1918.

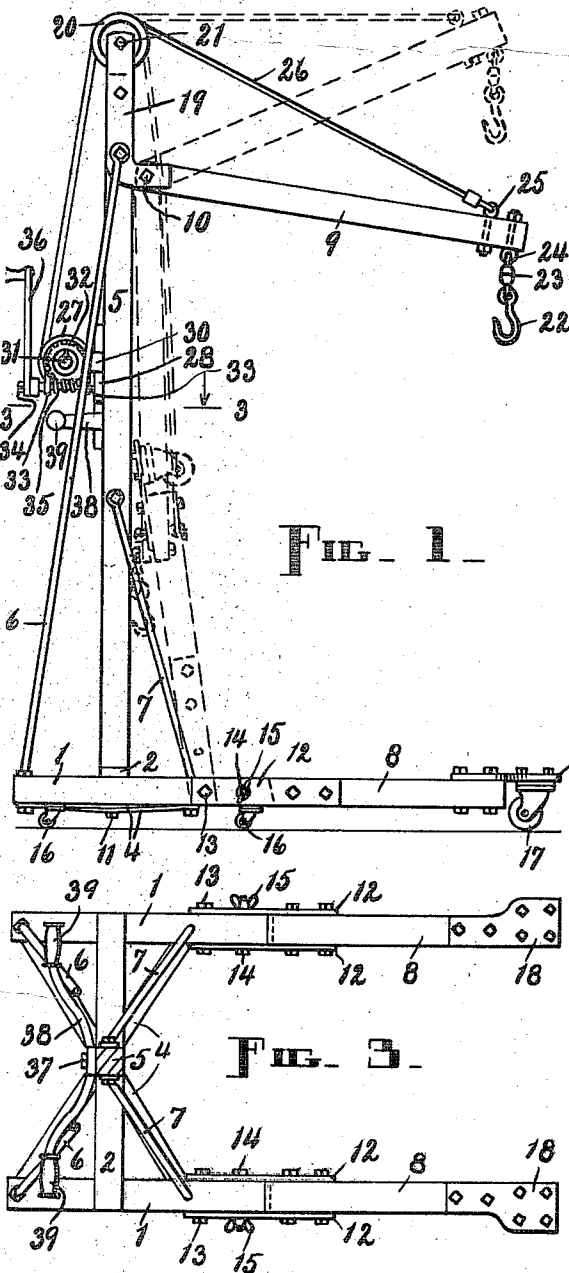


FIG. 1

FIG. 3

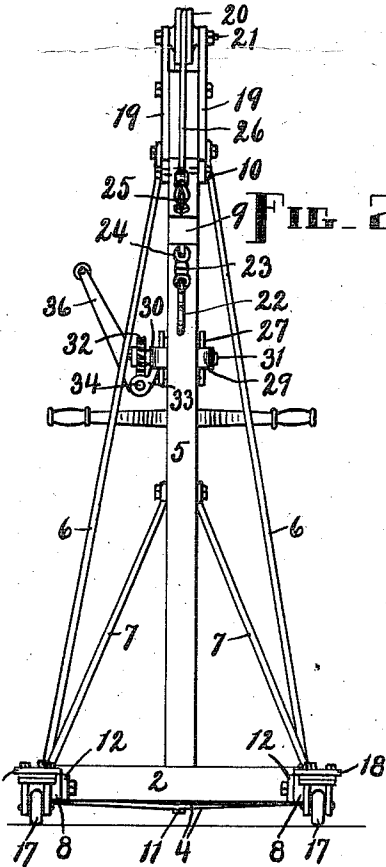


FIG. 2

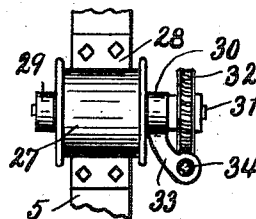


FIG. 4

WITNESS:

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JULIUS EWIG AND FREDERICK KATTLER, OF SPRINGFIELD, MASSACHUSETTS.

PORTABLE CRANE.

1,284,277.

Specification of Letters Patent.

Patented Nov. 12, 1918.

Application filed February 27, 1918. Serial No. 219,357.

To all whom it may concern:

Be it known that we, JULIUS EWIG and FREDERICK KATTLER, both citizens of the United States of America, and residents of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Portable Crane, of which the following is a specification.

Our invention relates to improvements in portable lifting or hoisting devices of the derrick or crane type, and consists of a certain peculiar frame having folding base extensions, a pivotally-attached spar or boom, and pushing members or handles, and equipped with hoisting mechanism, all as hereinafter set forth.

The primary object of our invention is to produce a comparatively light and inexpensive, but strong and durable, conveniently operated, and portable device with which a heavy load can be raised, conveyed from one place to another, and lowered with ease, and which can be readily folded into a compact form when not in use, and as readily unfolded and made ready for use.

This device can be made strong enough to handle several if not many times the weight of a person operating the same, and at the same time be subject to the complete control of such person; or, in other words, a person comparatively light in weight and not possessing great strength, can without undue exertion, lift, move about, and deposit, with said device, a load that may weigh hundreds of pounds.

The crane is designed for use in shops and factories for handling various objects, a notable example being automobile engines, or in any place where a portable apparatus is needed for handling a comparatively heavy load with a comparatively small expenditure of human energy. This crane is operated, including the propulsion of the same, by hand, and is designed more particularly as a one-man machine, or a device or machine that one person is capable of operating to advantage. The crane may, of course, be made of a size and character which will require the services of more than a single person in the operation thereof.

Other objects and advantages will appear in the course of the following description.

We attain the objects and secure the advantages of our invention by the means illus-

trated in the accompanying drawings, in which—

Figure 1 is a side elevation of a portable crane that embodies a practical form of our invention, the base extension being shown down in operative position, in full lines, and up in inoperative, folded position, by broken lines, and the boom being shown up in two operative positions, in full and broken lines, and down in inoperative, folded position, by broken lines; Fig. 2, a front elevation of said crane, it being assumed that the rear elevation is that where are located the hand-operated hoisting mechanism and the propulsion handles, and behind which the operator stands or walks; Fig. 3, a cross-section through the crane, taken on lines 3—3, looking down, in Fig. 1, and, Fig. 4, an enlarged elevation of the hoisting drum and supporting and associated parts and members, as viewed from the rear.

Similar reference numerals designate similar parts throughout the several views.

It is necessary, in a device of this kind, to have a frame which, while taking up but comparatively little floor space, even when in use, is stiff and strong. To this end, therefore, the frame of our crane comprises a pair of short side pieces 1 rigidly connected by a transverse cross bar 2, and by diagonal, crossed straps or braces 4, which constitute the base of the frame, an upright or post 5 rising from the center of said bar, a pair of long and a pair of short braces or tie rods 6 and 7, respectively, and a pair of folding, base extensions or arms 18. There is also a forwardly-extending boom 9 having its rear end pivotally connected at 10 with the post 5 a short distance below the top of said post. The boom 9, although not a part of the frame of the crane in the strict sense of the term, is supplementary thereto. The cross bar 2 is between and extends over the tops of the side pieces 1, the crossed braces 4 are underneath said side pieces, and said braces are fastened together in the center, at 11, as well as having their ends secured to said side pieces. Each long tie rod 6 is secured at the lower end to one of the side pieces 1 back of the cross bar 2 or adjacent to the rear end of the side piece, and at the top to the post 5 a little below the top of said post; and each short tie rod 7 is se-

cured at the lower end to one of the side pieces forward of said bar, and at the top to said post about half-way between the base of the post and the point of attachment of the long tie rod on the same side, the long and short tie rods on either side being attached to the side of the post which is adjacent to the side piece to which the lower ends of said last-named rods are attached. Each arm 8 is provided with a pair of rearwardly-extending lugs 12, and these lugs have their rear terminals pivoted at 13 to one of the side pieces 1 some distance behind the front end thereof, the construction and arrangement of parts being such that, when the arm is down in operative position, the side piece projects between the two lugs and is in contact at the extreme front end with the extreme rear end of said arm.

As a means of rigidly securing each arm 8 in its horizontal and operative position, a bolt 14 is passed through the lugs 12, with which said arm is provided, and that part of the contiguous side piece 1 that is forward of the pivot 13 which connects said lugs with said side piece, and said bolt is secured in place with a thumb-nut 15. Upon removing the thumb-nuts 15 and withdrawing the bolts 14, the arms 8 may be turned up, on the pivots 13, out of the way against the post 5, as shown by broken lines in Fig. 1. When the arms 8 are down in line with the side pieces 1, and the bolts 14 are in place, said arms are held securely and rigidly in such position by the pivots 13 and said bolts, and prevent the crane from pitching forward under the stress of its load supported from the free end of the boom 9.

The frame of the crane is mounted on and provided with anti-friction members, such as four swivel casters 16 attached beneath the side pieces 1 adjacent to the ends thereof, and two swivel casters 17 attached to lugs 18—18 at the free ends of the arms 8. The casters 16 and 17 enable the crane to be propelled with comparative ease and freedom, even when the same is carrying a heavy load.

The boom 9 is not pivoted directly to the post 5, in this case, but between and to the forwardly-projecting arms of a pair of angular brackets 19, which brackets are bolted or otherwise rigidly secured to the sides of said post and project above the latter. A pulley 20 is mounted between the upper terminals of the brackets 19, above the top of the post 5, on an axle member 21 that is mounted in said brackets. The boom 9 is provided at its free end with a hook 22 to which the load is attached. The hook 22 is suspended, by means of a swivel 23, from a downwardly-directed eye-bolt 24 which is fastened to the boom 9. An upwardly-directed eye-bolt 25 is attached to the boom 9 back of the eye-bolt 24, and a

cable 26 has one end fastened to said eye-bolt 25. The cable 26 passes rearwardly, from the eye-bolt 25, over the pulley 20, and down behind the post 5 to a winding drum 27. It is by means of the cable 26 that the load is raised and lowered, since the boom 9, to which the load is attached, is swung up or down on the pivot 10, accordingly as said cable is wound on the drum 27 or unwound therefrom. When the cable 26 is paid out sufficiently, the boom 9 is permitted to swing down against and into approximately parallel relation with the post 5, as represented in the first view, and is then out of the way. The free terminal of the boom 9 at this time is between the free terminals of the arms 8, provided the latter be in folded position. It is possible for the boom 9 to be turned down against the post 5, because the pivot 10 is located forward of the post by the bracket 19.

A bracket 28 having rearwardly-extending, bearing arms 29 and 30 is rigidly secured to the back of the post 5, and a horizontal shaft 31 is journaled in said arms. The winding drum 27 and a worm-gear 32 are secured on the shaft 31, said drum being between the arms 29 and 30, and said worm-gear being outside of said arm 30. Extending down from the arm 30, and outwardly under the worm-gear 32, is a pair of bearing arms 33. A horizontal shaft 34 is journaled in the arms 33 at right angles to the shaft 31 and directly under the worm-gear 32, and a worm 35 secured on said shaft 34 intermeshes with said worm-gear. The rear end of the shaft 34 is squared to receive a crank 36 with which to operate the winding mechanism. When the shaft 34 is rotated in one direction, by means of the crank 36, the drum 27 is rotated, through the medium of the worm 35, the worm-gear 32, and the shaft 31, to wind up the cable 26 and so swing the boom 9 upwardly, and, when said shaft 34 is rotated in the other direction, said drum is rotated to unwind said cable and so permit said boom to swing downwardly.

This worm-operated, winding mechanism affords all the power necessary, no brake is required with it, and it is suitable for hand operation, hence said mechanism is superior in the factors of power, control, and operation, also simplicity and compactness, to any other form or type.

Securely fastened against the back of the post 5, at 37, is a cross bar 38 which has handles 39—39 at the ends. The bar 38 with its handles is at a suitable height and of proper length to afford serviceable and convenient means for pushing or propelling the crane about on the floor, either when the crane has a load attached thereto, or when it is free from any load.

In practice, assuming that the arms 8

are down and locked in operative or supporting position, and that the boom 9 is up and ready to receive a load, the crane is pushed, by means of the handles 39, to the vicinity of a load which it is desired to raise and move from its present position, and such load is attached to the hook 22. The crank 36 is then turned to wind up the cable 26, swing up the boom 9, and raise the load. After the load has been raised to the desired height, and while held suspended by the worm members, the crane is propelled to the place where the load is to be deposited. At the aforesaid place the crank 36 is turned to unwind the cable and permit the load to descend. When the load is deposited and detached from the hook 22, the crane is ready to be used again in a similar manner.

The arms 8 and the boom 9 are folded against the post 5 whenever the crane is not needed and it is desired to store it away in a small space.

In the foregoing description of the construction of the crane, it is assumed, unless otherwise stated, that the arms 8 and the boom 9 are in operative positions, otherwise some of the terms used, such as rear end for example, would not apply.

More or less change in the shape, size, arrangement, and construction of some or all of the parts of the crane may be made, without departing from the spirit of the invention or exceeding the scope of what is claimed.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in a crane, with a frame consisting of side pieces connected by a cross bar and by crossed braces, a post rising from said bar, forwardly- and rearwardly-extending tie rods connecting said post with said side pieces, base extension members pivotally connected with the front ends of said side pieces, and locking and releasing means for said members, of anti-friction supporting members for said frame.

2. The combination, in a crane, with a portable frame consisting in part of side pieces, and of arms having lugs which are

pivotally attached to the front terminals of said side pieces, of releasable means to lock said lugs to said side pieces when said arms are in line therewith.

3. A crane comprising a portable frame having upwardly folding base extension members, and a pivotally-attached downwardly folding boom.

4. In a crane, a portable frame comprising connected side pieces, arms provided with lugs to embrace the front terminals of said side pieces, pivots connecting said lugs with said side pieces, and bolts adapted to pass through said lugs and side pieces, in front of said pivots.

5. In a crane, a portable frame comprising a post provided with a pair of angular brackets rigidly attached to said post at the upper end and projecting forward of and above the post, a boom having one terminal received between and pivoted to the forwardly extending parts of said brackets, in front of said post, a pulley mounted between the upwardly-extending parts of said brackets above said post, winding mechanism attached to said post, and a cable passing from said mechanism over said pulley to said boom.

6. A frame, for a portable crane, comprising side pieces connected by a cross bar and by crossed braces, a post rising from said bar, and forwardly- and rearwardly-extending tie rods connecting said post with said side pieces, the latter having articulated to their front ends extension members which are arranged and adapted to bear at their front ends on the floor.

7. The combination, in a crane, with a portable frame consisting in part of side pieces, and of arms articulated to the front terminals of said side pieces, of releasable means to lock said arms and side pieces together when the former are in supporting position.

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Witnesses:

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