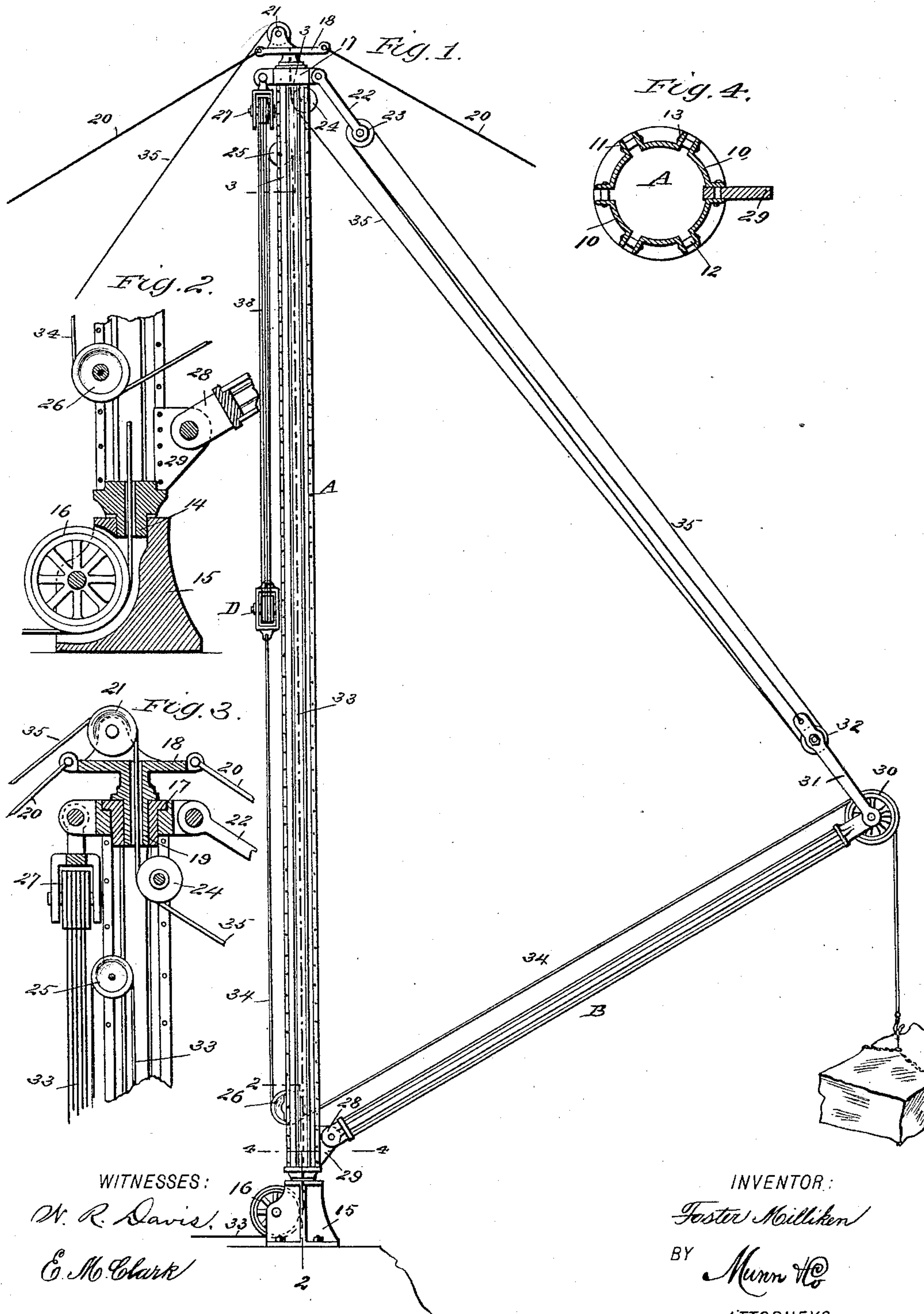


(No Model.)

F. MILLIKEN.  
DERRICK.

No. 453,087.

Patented May 26, 1891.





# UNITED STATES PATENT OFFICE.

FOSTER MILLIKEN, OF NEW YORK, N. Y.

## DERRICK.

SPECIFICATION forming part of Letters Patent No. 453,087, dated May 26, 1891.

Application filed February 19, 1891. Serial No. 382,085. (No model.)

*To all whom it may concern:*

Be it known that I, FOSTER MILLIKEN, of New York city, in the county and State of New York, have invented a new and useful Improvement in Derricks, of which the following is a full, clear, and exact description.

My invention relates to an improvement in derricks, and has for its object to construct a derrick capable of hoisting heavy weights.

Another object of the invention is to provide a means whereby the mast and boom may be of tubular shape, and also to provide a means whereby the articles may be lifted and carried from place to place within the compass of the boom in a simple, effective, and expeditious manner.

A further object of the invention is to provide a means whereby the hoist-rope after the load has been removed therefrom may be readily drawn downward to receive another load, and wherein the hoist rope or ropes will be effectually protected from undue frictional contact with its guides or supports.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures and letters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the complete derrick. Fig. 2 is a vertical section through the lower portion of the derrick, taken on the line 2 2 of Fig. 1. Fig. 3 is a vertical section taken at the top of the mast on the line 3 3 of Fig. 1, and Fig. 4 is a horizontal section taken on the line 4 4 of Fig. 1.

The mast A is in the shape of a Phoenix column, being constructed of a series of longitudinal sections 10, which sections are provided at their side edges with outwardly-extending flanges 11, and the complete column is formed by inserting thimbles or sleeves 12 between the flanges of the sections 10 and passing bolts 13, rivets, or equivalent devices through the flanges and the thimbles or sleeves, as illustrated in Fig. 4.

The boom B is constructed in like manner to the mast, but is of much less diameter. The mast terminates at its lower end in a

pivot-pin 14, which pin is provided with a longitudinal bore extending entirely through it and leading into the interior of the mast. The pin 14 is seated in a socket formed in the base 15, and by so seating the mast it may be readily revolved upon the base.

In one side of the base, in front of the tubular pivot of the mast and in a channel leading into the socket, a grooved wheel 16 is journaled. The top of the mast is covered by a cap 17, upon which a cap-plate 18 is pivoted by a tubular shank 19. From the plate 18 any desired number of guide or stay ropes or rods 20 are carried downward and are secured in any suitable or approved manner to any convenient ground-support. The plate 18 is further provided upon its upper face with a friction-pulley 21. An arm 22 is pivotally connected to one side of the cap 17, and in the lower end of the arm a group of friction-pulleys 23 is journaled. Immediately below the cap 17 a pulley 24 is journaled in the mast, and at the opposite side of the mast a lower friction-pulley 25 is pivoted. The pulleys 24 and 25 may be journaled upon pins located in plates clamped between the flanges of two opposed mast-sections, or said pulleys may be journaled directly upon one of the sleeves 12 intervening said flanges, as is indicated in Fig. 3. A larger guide or friction pulley 26 is journaled in the lower end of the mast upon the same side at which the upper pulley 25 is located. A block 27, containing a number of friction-pulleys, is also pivotally attached to the cap of the mast, the said block being located opposite the arm 22.

The boom B is provided with a forked heel 28, which is made to straddle a plate 29, clamped between two sections of the mast at the lower end thereof, and the boom is pivotally connected to the plate by passing a pin through said plate and the forked heel 28. The outer end of the boom is bifurcated and between the members a guide-pulley 30 is journaled, and a strap 31 is likewise pivotally attached to the bifurcated end of the boom, which strap at its unattached end is bifurcated to receive a number of friction-rollers 32.

A hoist-rope 33 is carried from the drum of the engine or equivalent hoisting device under the base-pulley 16 upward through the



tubular pivot-pin of the mast and into and through the interior of the mast over the upper pulley 25, from whence the hoist-rope is carried downward over a pulley contained in a counterbalance-block D. Thence the rope or cable is carried upward over one of the pulleys in the upper block 27. After the rope has been carried over as many pulleys as may be desired in the counterbalance-block and the upper block it is fastened at its end in any suitable or approved manner to the upper surface of the counterbalance-block, as illustrated in Fig. 1. At the lower end of the counterbalance-block a second section 34 of the hoist-rope is secured and is carried downward over the lower mast-pulley 26, outward from the mast over the boom, and downward over the pulley 30 at the outer end of the boom, the lower end of this second section of the hoist-rope being provided with any approved form of grappling device.

The boom is raised and lowered through the medium of a rope or cable 35, which is attached to an independent drum and is passed over the plate-pulley 21, thence downward through the tubular shank 19 in the upper end of the mast, over the mast-pulley 24, and as many times as may be desired over the pulleys 23 and 32, the end of the said cable 35 being secured to the strap 31.

It will be observed that by reason of the construction above described I am enabled to carry the hoist-rope upward through the mast with the least possible amount of friction, and that the rope does not at any time pass over or come in engagement with any angular or rough surfaces calculated to injure it by frictional contact.

It is obvious that a derrick capable of lifting a great weight may by the improved construction be rendered very light, yet exceedingly strong, and, further, that the counterpoise-block D, being unattached to the mast, may be made heavy enough to counterbalance the weight of the lifting-rope and the friction of the rope passing over its pulley, thus enabling one man to draw the tackle end of the rope or cable downward for attachment to an article to be hoisted.

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

1. In a derrick, the combination, with a tubular mast, of a boom pivoted to the mast and provided with a pulley at its free end, means for raising and lowering the boom, a

pulley-block at the top of the mast, a counterpoise pulley-block, a rope passed up through the mast and through the said pulley-blocks, and a second rope secured to the counterpoise pulley-block and passed over the pulley on the end of the boom, said rope carrying a grapple on its end, substantially as described.

2. In a derrick, the combination, with a hollow pivoted mast provided with the pulleys 25 and 26, of the boom B, pivoted to the mast and provided with the pulley 30, means for raising and lowering the boom, the block 27, suspended from the top of the mast, the counterpoise-block D, the rope 33, passed up the mast, over the pulley 25, and through the pulley-blocks 27 and D, and the rope 34, secured to the pulley-block D and passed over the pulleys 26 and 30, said rope carrying a grapple at its end, substantially as herein shown and described.

3. In a derrick, the combination, with a base and a hollow mast pivoted thereon and provided with the pulley 21 on the top and the pulley 24 near the top, of the arm 22, pivoted to the mast and provided with the pulleys 23, the boom B, pivoted to the mast, the arm 31, pivoted to the boom and provided with the pulleys 32, and the rope 35, secured to the arm 31, passed around the pulleys 23 and 32, under the pulley 24, and then over pulley 21, substantially as herein shown and described.

4. In a derrick, the combination, with a base provided with a socket and a pulley journaled in the base, a portion of the periphery of which pulley is adjacent to the socket, of a tubular mast, a tubular pivot-pin secured to the mast, communicating with its interior and adapted to enter the base-socket, a pulley journaled in an opening near the top of the mast, a hoist-cable passed under the pulley of the base, through the mast-pivot and the mast, and over the upper pulley of the mast, a counterpoise-block adapted to receive the hoist-cable, said block being free of the mast, a boom pivoted to the mast, a cable attached to the counterpoise-block and passed over a pulley in the mast, over the boom and a pulley journaled therein, and a means for elevating and lowering the boom, substantially as specified.

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Witnesses:

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