(No Model.) 2 Sheets—Sheet 1.

D. H. CRAM.

DERRICK.

No. 382,141. Patented May 1, 1888.

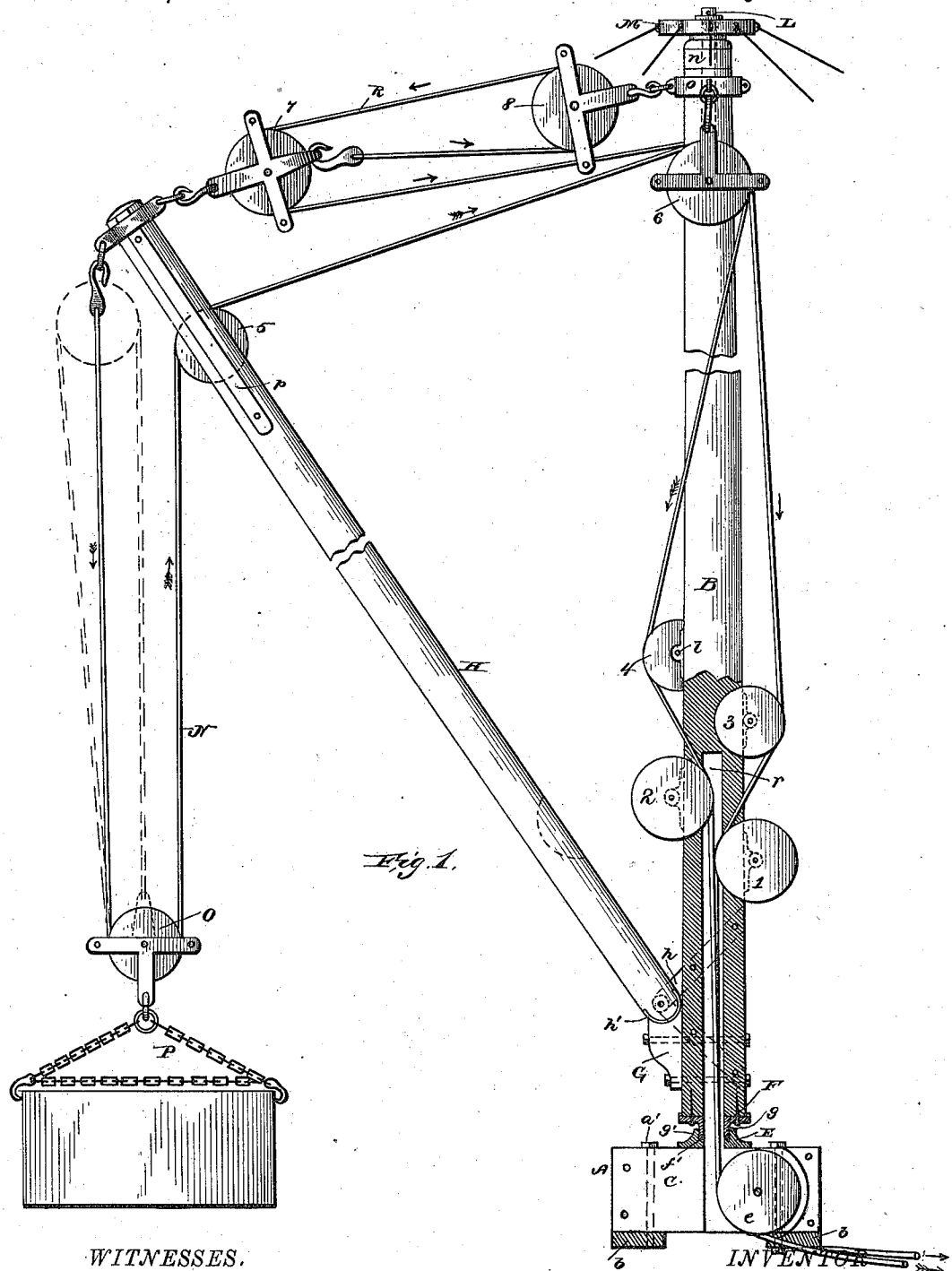


Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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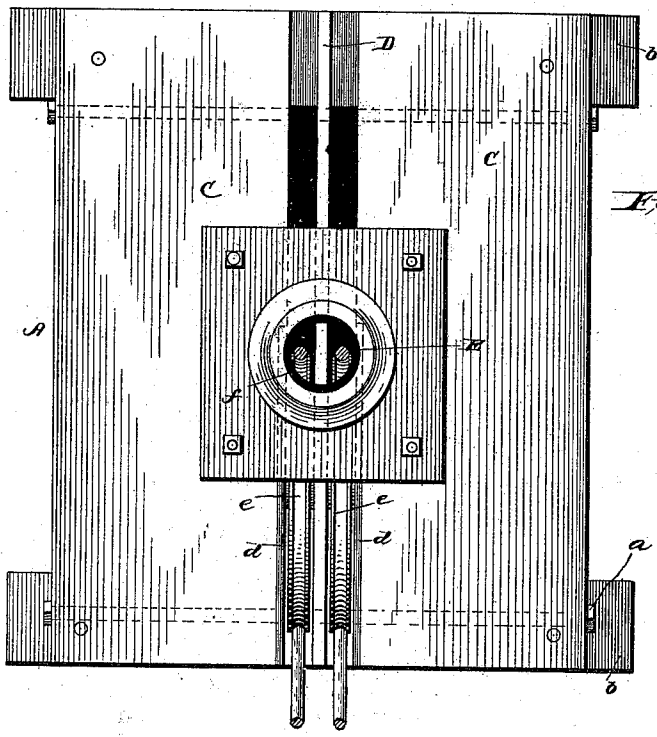


Fig. 2.

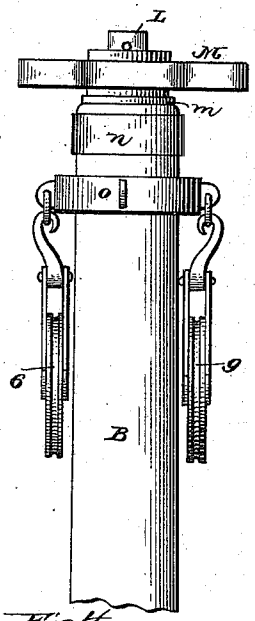


Fig. 4.

Fig. 3.

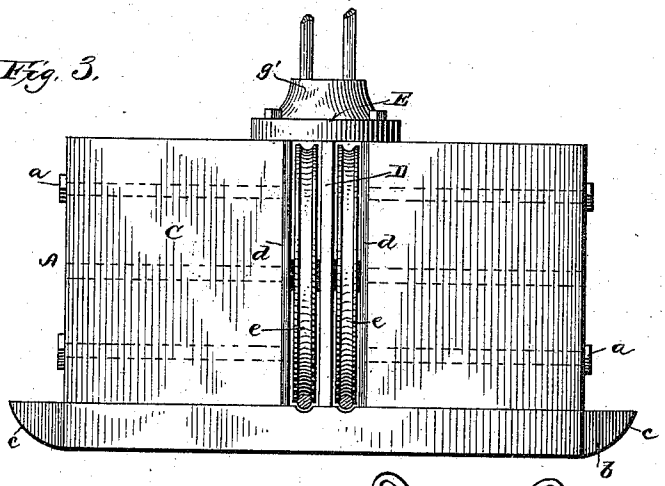
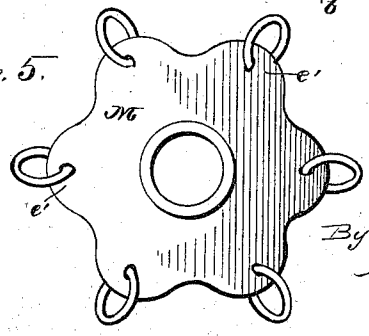


Fig. 5.



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SPECIFICATION forming part of Letters Patent No. 382,141, dated May 1, 1888.

Application filed January 12, 1888. Serial No. 260,575. (No model.)

To all whom it may concern:

Be it known that I, D. HENRY CRAM, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Derricks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to that class of hoisting apparatus which has a boom pivoted to a mast which is movable or may be turned on its support; and it has for its object to provide an apparatus of this class which will be of few and simple parts, easily and speedily operated, and adapted to raise very heavy weights; and it consists of the parts and combinations of parts hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of my improved apparatus, having the mast partly broken away and one side of the foot-block removed; Fig. 2, a detail plan view of the foot piece or block; Fig. 3, an end view of the same; Fig. 4, a detail of the upper end of the mast, and Fig. 5 a detail view of the swivel-cap.

Similar letters refer to similar parts throughout the several views.

A represents the foot-block on which the mast B is supported. This block consists of two beams, C, of wood, which are laid side by side at a suitable distance apart and secured thus by means of transverse bolts *a*, so that a narrow space or channel will be left between them. To the under side of these beams, near their ends and at right angles to or across the same, skids *b* are secured by bolts *a'*, passing vertically through the beams, the ends of which skids are curved or rounded off, as at *c*, and extend outwardly a short distance beyond the beams on each side, as clearly shown in Figs. 2 and 3. The object of thus giving the end of the skids a curve is to enable the derrick to be moved easily from place to place, after the manner of a sleigh, the curved ends *c* easily rising over any obstruction that may be in the way. In the center of the longitudinal space between the beams C a plate of metal, D, is secured by the bolts *a*, and on each side of this plate, at one end of the foot-piece, the sides of the beams C are lined with sheet metal, *d*, which extends back to about the center of the beams, and at this end of the foot-piece I journal two sheaves, *e*, one on each side of the plate D and below the upper surface of the beams C, on a pin which passes through said plate and the beams. Thus it will be seen that the sides of the beams are protected against wear caused by the movement of the sheaves against the same, and that a better bearing is secured for the sheaves, owing to the plate supporting the central or middle part of the pin, thus preventing the same bending and the sheaves from wabbling from side to side, as this construction causes the pin to wear evenly and no room is left for the sidewise movement of the sheaves. The tackle for operating the apparatus also passes between the plate and the sides of the beams, as will be hereinafter described, to the power employed, and would wear the beams if they were not thus protected.

Immediately over the space or channel between the beams and at the center of the same I secure by bolts a metal bearing-plate, E, to support the lower end of the mast B. This plate is cast with an upwardly-extending sleeve, *g'*, at its center, and in the interior of this sleeve a shoulder, *f*, is formed, on which rests the hollow rounded projecting pivot *g* of the metallic foot-plate F, which is secured to the bottom of the mast in any desired manner. Between the upper surface of plate E and lower surface of plate F, I place a steel washer, *f'*, for the purpose of reducing the friction and causing the parts to move easily on each other. A wooden rest-block, G, is bolted to the mast a short distance above the lower end of the same, the upper surface of which is slightly concaved or curved to receive the end of the boom H, and thus relieve the pivot-bars *h* of downward strain when a heavy weight is being raised. The lower end of the mast is bored out for a short distance to form a way, *r*, for the tackle, as will be explained hereinafter.

On opposite sides of the mast mortises are formed sufficiently deep to receive about one-third of the sheaves 1, 2, 3, and 4, which are journaled in boxes *l*, secured to the mast, the

two lower sheaves, 1 2, projecting into the way *r*. These sheaves are arranged one above another and form, as a whole, a zigzag line, the two lower sheaves, 1 2, being of greater diameter than the two upper, 3 4, which are merely guide-sheaves to prevent the tackle wearing the mast.

At the upper end of the mast I rigidly secure a gudgeon-pin, L, a portion of which extends above the top of the mast, and on this part, after slipping on washers *m*, I place the swivel-cap M, as clearly shown in Fig. 4. This cap is provided with a hub or collar on both sides, and is held in place by a pin passing through the gudgeon-pin L. By casting the cap with collars or hubs a larger bearing is secured and the liability of breakage of the gudgeon-pin lessened. To perforated lugs *e'*, cast with this cap, rings are secured, to which the guy-ropes are attached in any desired manner and lead to the fixed stakes to hold the apparatus in an upright position.

Surrounding the end of the mast are two bands, *n o*, the upper of which being intended merely to prevent the mast splitting, while the lower one, *o*, is provided with eyes, to which pulleys may be hung.

The boom H, as clearly shown in Fig. 1, is pivoted at the apex of and between bars *h*, and its lower end is shod with sheet metal, *h'*, to prevent wear of the same, while its upper or outer end has strips or plates of metal, *p*, on each side, to strengthen the same at the point where the sheave 5 is journaled in a mortise in the boom, the extreme end of the boom being protected by a metal band shrunk thereon.

The hoisting-wire N (course indicated by feathered arrows) is hooked to the end of the boom and runs around a block, O, having a hook which is attached to the grab-hook chain P, and leads from there to and over the pulley 5, journaled in the end of the boom, and thence over pulley or block 6, which is loosely hung to band *o* at the upper end of the mast, and thence past the guide-sheave 4 into the way *r*, past the sheave 2, and down said way through the plates E and F into the space between the beams, and past one of the sheaves *e* to the power. This wire may be hooked to block O, if desired, as indicated by dotted lines.

The block 6 may be dispensed with, if found desirable, and the hoisting-wire led directly to sheave 2; but the use of pulley 6 is desirable when a heavy weight is to be raised.

The boom hoist-wire R (course indicated by unfeathered arrows) is hooked at one end to a block, 7, which is secured to the outer end of the boom and leads from it to block 8, which is hooked to the band *o* on the mast and passes around the same and back to block 7, and, passing about this block, is led back to block 9, which is also hooked to band *o*, (see Fig. 4,) and from thence down along the mast to guide-sheave 3, thence into the way *r* and past sheave 1, through the way and plates E F, past one of the sheaves *e* in the foot-block, and from thence to the power.

Owing to the fact that my sheaves 1, 2, 3, and 4 are inserted partly in mortises in the mast and are journaled in boxes secured to the same, instead of having eyebolts passing through the mast and carrying the sheaves on their ends, I secure greater strength and durability than is possible where the eyebolts are used, because the latter must necessarily be extended from the mast a great distance to accommodate the sheaves and permit the passage of the tackle between the sheaves and mast, and thus they are liable to bend or break; also, by providing an extra band with rings or eyes formed on or secured to the same at the upper end of the mast for the attachment of the blocks, I do away with the mortises usually formed in the same for sheaves, thus lessening the liability of the mast snapping at this point.

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

1. The combination, in a foot-block of a derrick, of the beams bolted side by side and provided with sheet metal on their contiguous sides, the skids having curved ends secured to the under side of said beams and projecting beyond the same at each side, the metal plate rigidly secured between said beams, and the sheaves journaled between said plate and beams, substantially as described.

2. The combination, in a derrick foot-block, of the beams C, bolted side by side, the skids having curved ends bolted to said beams, the metal plate secured between said beams, the metal wearing-surfaces *d*, the pin passing through said beams and plate, and the sheaves journaled on said pin between the plate and beams, substantially as described.

3. The combination, with the foot-block of a derrick, of a metal bearing-plate having a projecting hollow extension or sleeve provided with a shoulder on its interior, the mast having the way *r* formed in its lower portion, and provided with the metal foot-plate having a hollow pivot adapted to fit within said hollow extension or sleeve, and a washer resting on said shoulder, substantially as described.

4. The combination, in a derrick, of the foot-block, the mast resting on the same, the bars *h*, secured to said mast, the boom having its lower end iron-shod and pivotally secured to said bars, the wooden rest-plate having the concaved or curved upper surface bolted to said mast, and means for operating said boom, substantially as described.

5. The combination, in a derrick, of a foot-block having a channel centrally through it, a plate secured and sheaves journaled in said channel, a metal bearing-plate having a hollow projection or sleeve provided with an interior shoulder, a mast having a foot-plate provided with a hollow pivot adapted to fit within said sleeve, and said mast having a way formed in its lower end, sheaves journaled in boxes secured to the mast, said sheaves fitting partly in mortises in the mast, a wooden rest-plate having a curved or concaved upper surface

bolted to the mast, a boom pivotally secured to the mast and having its lower end iron-shod, and a wire hoisting-rope and boom-hoist adapted to pass over the last-named sheaves through the way and foot-block to the power, substantially as described.

6. The combination, in a derrick, of a foot-block having a channel formed centrally through it, a mast adjustably supported on said foot-block and having a way formed in its lower end, sheaves working in mortises formed in said mast and journaled in boxes secured thereto, a boom pivotally secured to said mast and carrying a pulley, 5, near its outer end, a hoisting-wire, N, having one end secured to the outer end of the boom and passing around a pulley, O, to which the weight is hung, thence over pulley 5 to a pulley loosely hung to the upper end of the mast, thence down said mast over a guide-sheave, 4, into the way *r*, formed in the mast, and past pulley 2 into the channel of the foot-block, and a wire boom-hoist, R, having one end secured to a pulley-block, 7, loosely attached to the outer end of said boom, thence over a pulley, 8, loosely hung to the upper end of the mast, thence to pulley 7, thence to pulley 9, loosely hung to the upper end of the mast, and down the mast over guide-sheave 3 into the way and past sheave 1 into the channel in the foot-block, as set forth.

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

D. HENRY CRAM.

Witnesses:

ROBINSON WHITE,

FRANK G. MATTINGLY.