(No Model.)

D. CRANE.

PORTABLE DERRICK.

No. 306,134. Patented Oct. 7, 1884.

Fig. 1.

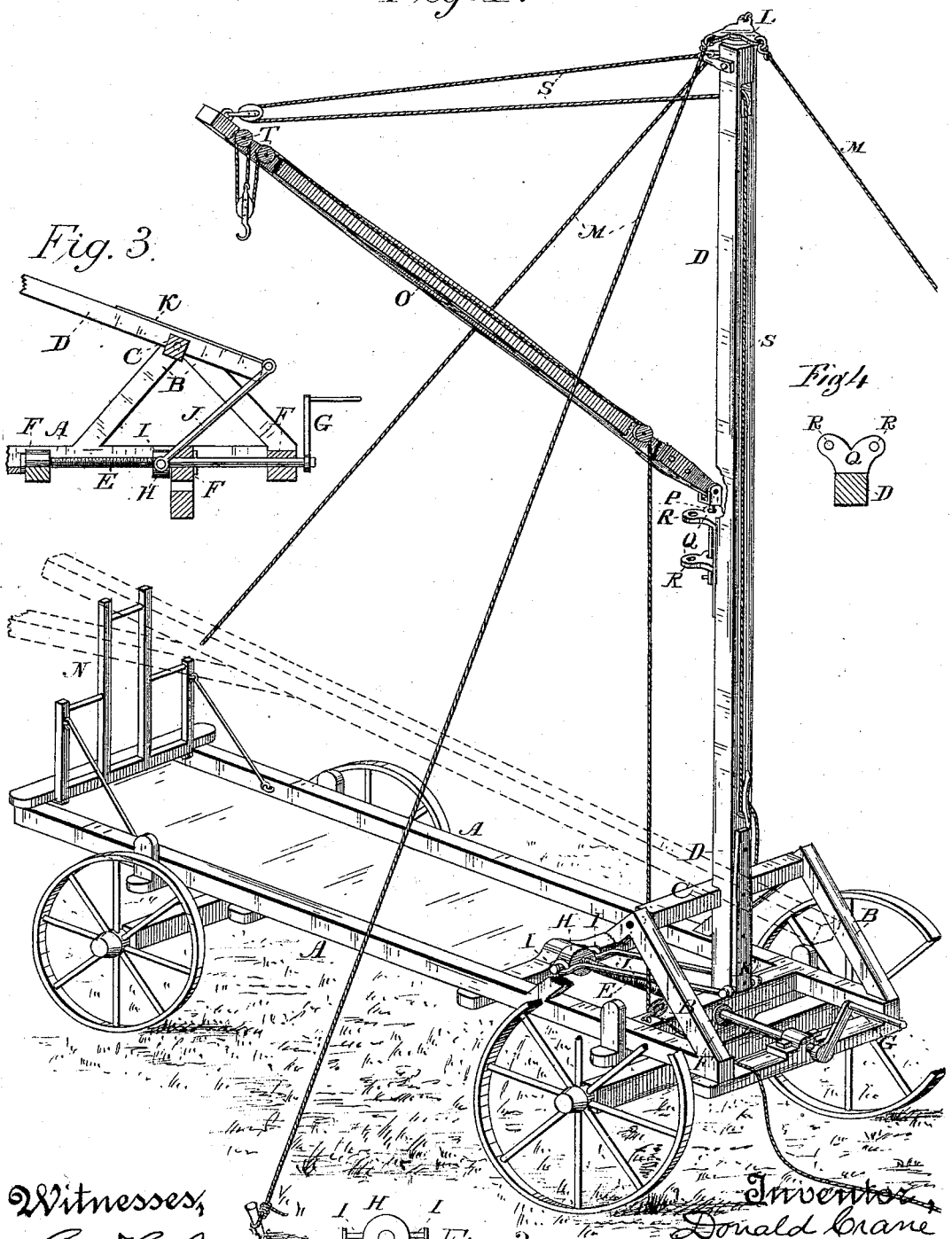

Fig. 3.

Fig. 4

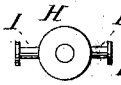

Fig. 2.

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UNITED STATES PATENT OFFICE.

DONALD CRANE, OF WOODLAND, CALIFORNIA.

PORTABLE DERRICK.

SPECIFICATION forming part of Letters Patent No. 306,134, dated October 7, 1884.

Application filed July 9, 1884. (No model.)

To all whom it may concern:

Be it known that I, DONALD CRANE, of the city of Woodland, in the county of Yolo and State of California, have invented an Improvement in Portable Derricks; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a portable derrick.

It consists, mainly, in an improved means for raising or lowering the mast, and in the attachment of the boom to the mast in such a manner that it may be caused to swing to either side, as desired, by gravitation without changing the position of the mast from a perpendicular.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 shows the mast standing vertically in a position for work, and in dotted lines shows the mast standing in position for transportation. Figs. 2, 3, and 4 are detail views.

In handling hay and grain in the harvest field, it has become customary to employ what are known as "portable derricks," which may be transported from place to place by laying the mast horizontally, it being raised to a perpendicular position and suitably guyed wherever it is necessary to use it. The truck or frame upon which the derrick is supported is usually mounted upon wheels, so as to form a wagon to carry the derrick. The mast being long and heavy, many devices have been employed to raise and lower it with the least amount of trouble.

In my invention, A is the horizontal frame, which may be mounted upon wheels suitable for its transportation from place to place.

B B are frames or timbers standing up from the side timbers of the frame A near one end, a shaft or axis, C, extending from one to the other near their apex, or at some little height above the level of the frame A. To this shaft is secured the mast D in any suitable manner, so that its lower end projects below the shaft C, and will rest upon the transverse timber of the frame A when the mast is in a vertical position. This lower end of the mast forms a short arm of the lever, the upper end or portion above the shaft C forming a long arm.

In order to provide sufficient power to raise the mast into a vertical position or to lower it easily into a horizontal one when it is desired, I employ a screw-shaft, E, extending horizontally and longitudinally midway between side timbers of the horizontal frame A, and having journal-boxes at F, within which it turns.

G is a crank (or gearing may be used, if more power is necessary) by which the shaft may be turned. This shaft has screw-threads cut upon it for a portion of its length, as shown, and a nut, H, has corresponding threads cut within it, so that it may be caused to travel along this screw-thread upon the shaft in either direction at will. Lugs or projections I extend out from each side of this nut, and short rods or links J are attached to these lugs and extend to the foot of the mast D, where they may be attached to similar lugs projecting from a stout plate, K, which is secured to the mast. It will be seen that when the screw is turned in one direction the nut will be caused to advance, and its action upon the foot of the mast through the links will be to gradually draw the foot of the mast downward around the axis C, upon which it is supported until the mast stands in a vertical position. At the top of the mast is a loose plate or spider, L, having holes or projections for attachment of the usual guy-ropes, M, which extend away from the mast and are secured at a suitable distance therefrom, so as to steady it and prevent its being overthrown by the weight which may be lifted upon the end of the boom. When the mast is to be lowered, these guy-ropes are loosened, and the screw being turned in an opposite direction the nut H will travel upon it, and, through the links, will press the foot of the mast backward and allow the upper end to gradually approach a horizontal position, the lower end swinging about the supporting-axis until the mast has reached the desired position. By the means of these links, which loosely connect the traveling nut with the foot of the mast, I am enabled to employ the screw, which is supported in stationary boxes at two or three points of its length, so that it will be rigid and strong enough for the work to be done, while the foot of the mast is allowed to describe the requisite arc of the circle while the mast is being raised or depressed. At the opposite end of the truck

or frame-work A from the gearing herein described is a support, N, upon which the mast, and also the boom, may be supported when the mast has been let down. This support is hinged to the truck-frame at the bottom, so that when the mast has been raised for work it may be let down flat upon the truck-frame and out of the way.

O is the boom, which I prefer to make of two separate timbers, placed side by side, with intervening blocks at intervals, by which they are braced and made stronger, while I secure greater lightness than could be obtained by making timbers solid. The inner end of the boom has a solid portion, to which is secured a stout iron hook, P, the end of which may enter holes in the plates Q, which is secured to the vertical mast, with a portion projecting horizontally from the mast when the latter is in a perpendicular position, as shown. This portion is of considerable width, extending a short distance to each side of the mast, and it has holes R made in each edge of it, into either of which the hook at the inner end of the boom may be placed. The outer end of the boom may be raised to any desired point and supported by guy-ropes S, extending from it over the top of the mast, and thence down to the suitable belaying-cleat near the bottom of the mast. The usual hoisting-blocks, T, are attached to the end of the boom with suitable gear for operating the derrick-forks or other devices which are to be operated by the derrick.

When it is desired to have the load swing to one side after it has been raised, the hook at the lower or inner end of the boom is placed in the hole R at the opposite side from which it is desired to have the boom swing. The foot being thus placed out of line, the action of gravitation will cause the boom to swing about the supporting-ropes to that side. If it is desired to have the load swing to the other side, the hook may be transferred into the hole R at the opposite side of the plate, thus transferring the foot of the boom to the opposite side of the center line and causing it to swing the other way.

In order to prevent the mast from turning about its own axis as the boom swings from side to side, I fix it rigidly to the fulcrum-shaft C, and the mast itself may be sawed out of a square form, which is cheaper to make, and it will be more steady when down.

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

1. In a portable derrick, a mast having journals about which it turns at some distance above its lower end, so as to provide a leverage below the journal or fulcrum, in combination with a device consisting of a screw, a crank, a nut provided with lugs, and the links for applying power to the lower end to move the mast from a horizontal to a vertical position, as herein described.

2. In a derrick, the mast having its fulcrum or journals upon which it turns fixed at a point a short distance above its lower end, a horizontal screw turning in stationary boxes, a nut constructed to travel upon said screw when it is revolved, and links connecting the nut with the foot of the mast, substantially as herein described.

3. In a portable derrick, the mast supported upon a fulcrum or journals a short distance from its lower end, a horizontal screw turning in stationary boxes, and means for rotating the same, a nut adapted to travel upon said screw when it is rotated, and having lugs or projections upon opposite sides, and links extending from these lugs to similar lugs upon the foot of the mast, so that power of the traveling nut may be applied to the mast to raise or lower it, and the foot of the mast is allowed to describe an arc of a circle while the nut travels in a straight line, as herein described.

4. In a portable derrick, the mast journaled so as to be raised or lowered, and a mechanism consisting of a screw and its connections applied to its lower end, by which it is moved, as shown, the frame A, upon one end of which this mechanism is secured, and upon the opposite end of which a support, N, is hinged, with braces, as herein described.

5. In a portable derrick, the mast supported upon a fulcrum about which it may be moved and raised and lowered in one plane, and boom having its outer end supported from the top of the mast by guy-ropes, as shown, its inner end provided with a bent hook, together with a plate secured to the mast, and having holes R upon each edge, into either of which the end of the boom may be inserted, so as to cause it to swing to one side or the other, as herein described.

In witness whereof I have hereunto set my hand.

DONALD CRANE.

Witnesses:
J. S. WHITE,
JNO. W. GOIN.