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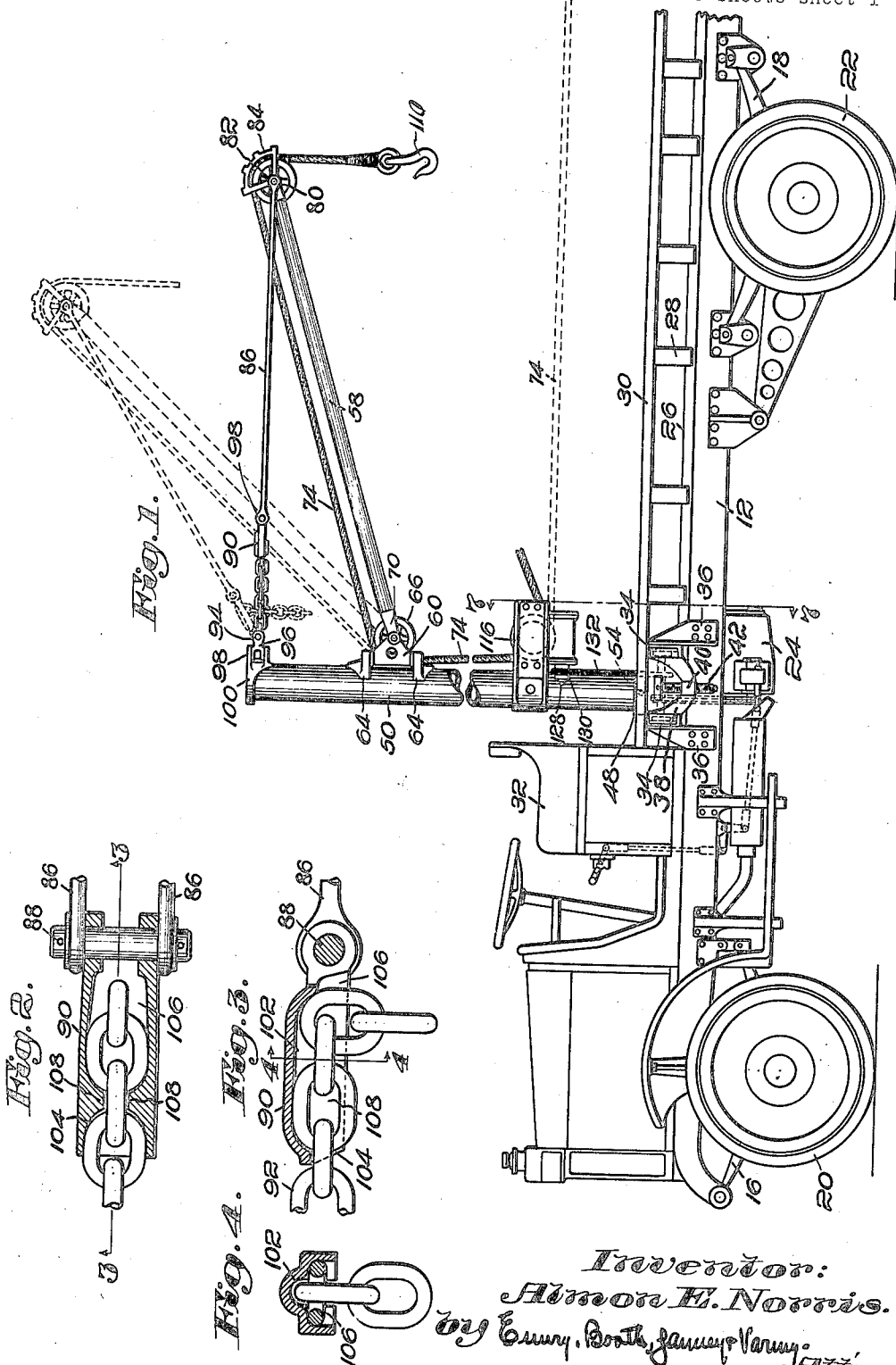
A. E. NORRIS

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TRUCK CRANE

Filed Mar. 12, 1921

3 sheets-sheet 1



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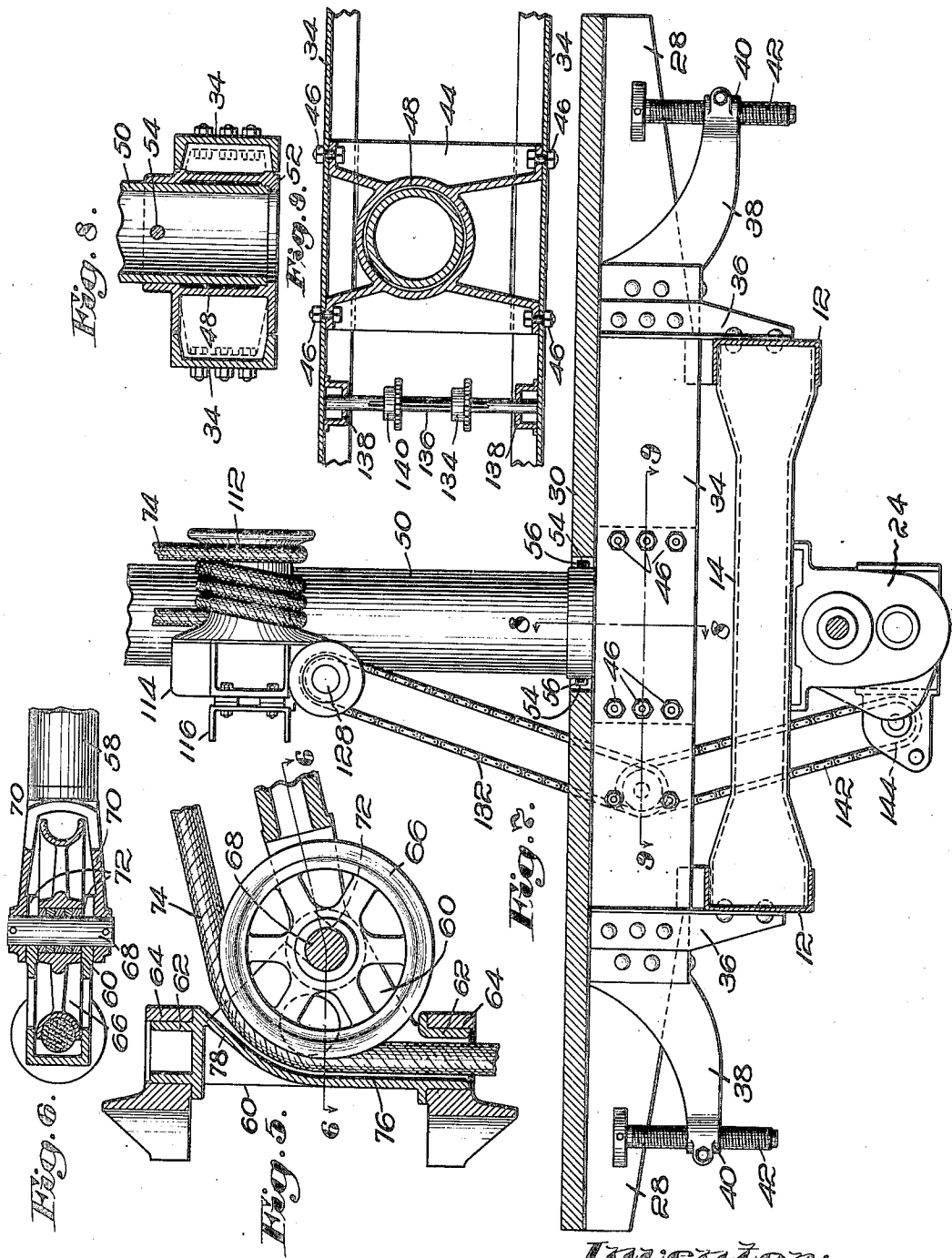
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TRUCK CRANE

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3 sheets-sheet 2



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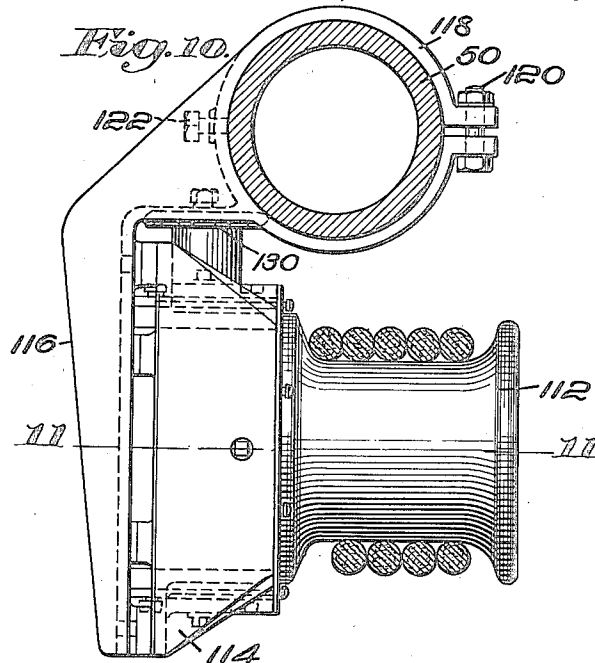
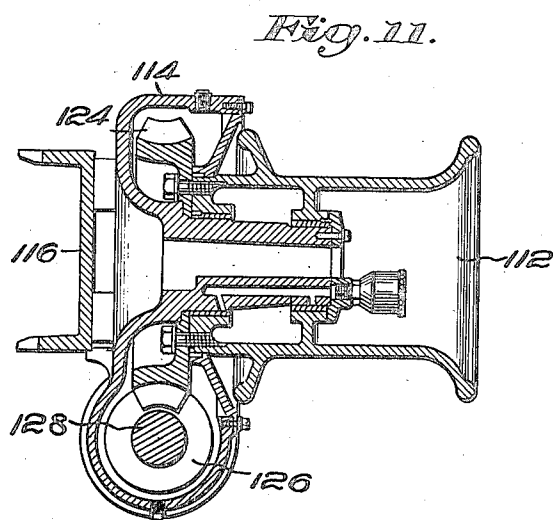
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TRUCK CRANE

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3 sheets-sheet 3



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UNITED STATES PATENT OFFICE.

ALMON E. NORRIS, OF BROOKLINE, MASSACHUSETTS.

TRUCK CRANE.

Application filed March 12, 1921. Serial No. 451,735.

To all whom it may concern:

Be it known that I, ALMON E. NORRIS, a citizen of the United States, and a resident of Brookline, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Truck Cranes, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to truck cranes of the class in which a crane is mounted on a motor truck having a load-supporting platform associated with a crane deriving its power from the motor of the truck, and arranged to transfer a load to and from the platform.

My invention will be best understood by reference to the following description, when taken in connection with the accompanying drawings of one illustrative embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a side elevation of a motor truck equipped with a crane exemplifying my invention;

Fig. 2 is a horizontal sectional view on an enlarged scale of an adjustable connection between a hook and a chain, affording a vertical adjustment for the boom;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a sectional view on line 4—4 of Fig. 3;

Fig. 5 is a vertical sectional view looking in the same direction as Fig. 1, illustrating the swiveled mounting for the boom and the sheave wheel at the inner end of the latter;

Fig. 6 is a sectional view on line 6—6 of Fig. 5;

Fig. 7 is a sectional view on an enlarged scale on line 7—7 of Fig. 1;

Fig. 8 is a sectional view on line 8—8 of Fig. 7;

Fig. 9 is a sectional view on line 9—9 of Fig. 7;

Fig. 10 is a plan of the winch, the mast which supports it being shown in horizontal section; and

Fig. 11 is a sectional view on line 11—11 of Fig. 10.

Referring to the drawings, and to the embodiment of my invention which is se-

lected for exemplification, and having reference at first more particularly to Fig. 1, I have shown a motor truck comprising any usual or suitable chassis having a frame provided with longitudinal side members 12 connected by one or more cross members, including a cross member 14 (see Fig. 7), said frame being supported by usual front and rear springs 16 and 18 and wheels 20 and 22. The power of the engine (not herein shown) is transmitted to the rear wheels through any usual transmission gear set 24 (see Figs. 1 and 7).

The described frame supports any suitable body, the one herein shown comprising a pair of longitudinal sills 26 connected by cross members 28 upon which a floor 30 is laid. The latter constitutes a load-receiving platform. The body also includes a suitable seat 32 for the operator.

I will now describe the crane-supporting frame, reference being had to Figs. 7, 8 and 9, more particularly Fig. 7. Extending cross-wise of the main frame is a pair of members 34, herein conveniently in the form of channel bars suitably supported on the longitudinal side members 12, as by angle-iron brackets 36 riveted to both sets of members. To the terminal portions of the cross members 34 are riveted brackets 38 presenting nuts 40 for jack-screws 42, which may be utilized in an obvious manner to prevent the truck from upsetting when heavy loads are being handled at the sides of the truck. The members 34 support a base 44 secured thereto as by bolts 46 (see Fig. 9), and presenting a socket 48 to receive an upright standard or column 50 commonly called a mast, the lower end of the latter resting upon a seat 52 (see Fig. 8) at the bottom of the socket. The mast is conveniently removable from its socket should occasion arise for dismounting it, but is normally secured in place by a pin 54 extending transversely through the mast and its socket. This pin may be held in place conveniently by cotter pins 56. By first removing the pin 54, the mast may be lifted out of its socket, since no part of the base projects above the upper surface of the floor except the upper edge of the socket, which in the present example projects but little.

The mast supports a boom 58 connected thereto by a universal mounting providing for swinging movement of the boom both

vertically and horizontally. In the present example, I have provided a mounting 60 best shown in Figs. 5 and 6, supported by the mast and mounted to turn about an up-
 5 right axis outside of the latter. Herein this is conveniently accomplished by providing the mounting with upper and lower bearing portions 62 received in bearing brackets 64, the latter being suitably secured as by weld-
 10 ing to the mast. The mounting also provides a convenient support for a sheave wheel 66, the latter being mounted to turn on a pin 68, which affords a conveniently detachable pivotal support for the boom,
 15 the latter to this end being forked to present arms 70, which receive the ends of the pin, while the latter in turn is received in notches 72 provided in the mounting 60. By reference to Fig. 6, it will be observed that the
 20 boom and sheave wheel may be conveniently removed from their place in the mounting by simply lifting the pin 68 in an upward and outward direction from the notches 72. Passing through the sheave wheel is a suit-
 25 able cable or rope 74, whose vertical lead is preferably coaxially disposed with reference to the pivotal axis of the mounting 60, the latter to this end being herein provided with an opening 76, whose axis is sub-
 30 stantially coincident with the axis of the bearing portions 62 (see Fig. 5). Preferably, the upper part of this opening is curved as at 78 to present a rope guard, which follows the contour of the rope where
 35 the latter passes over the sheave wheel.

The outer end of the boom is forked to receive another sheave wheel 80 mounted to turn on a pin 82, and associated with a suitable rope guard 84. The pin 82 also provides a suitable means of attachment for
 40 adjustable boom supporting means connected to the upper end of the mast. In the present example, the supporting means include a pair of rods 86 having their outer
 45 ends pivoted on the pin 82 and having their inner ends joined to each other by a horizontal pin 88 which presents a pivot for the attachment of suitable adjusting means, herein including a claw-hook 90, shown in
 50 detail in Figs. 2, 3 and 4, hooked onto a chain 92 in a manner which will presently appear. The inner end of the latter is pivotally attached by a horizontal pin 94 to a shackle 96 (see Fig. 1), which in turn
 55 is pivoted at 98 to turn about a vertical axis which is preferably substantially coincident with the axis of the mounting 60 hereinbefore described. The vertical pivot 98 is conveniently supported by a bracket 100
 60 suitably secured as by welding to the upper end of the mast 50.

I will now describe the adjustable connection between the hook 90 and the chain 92, reference being had to Figs. 2, 3 and 4.
 65 Referring to Fig. 3, the hook is provided

with a vertical groove 102 to receive the links which are disposed in a vertical plane, and it is further provided with horizontal
 recesses 104 and 106 to receive the links which are disposed in a horizontal plane. 70
 Between the recesses 104 and 106 are two inwardly projecting lugs 108, which are preferably inclined in a downward and outward direction, thereby to constitute a species of hook
 75 received between the adjacent ends of two links of the chain, and thus interlocking therewith. Adjustment of the height of the boom can be effected by simply lifting the hook out of engagement with the chain, and reengaging the hook therewith at another
 80 suitable point. The range of adjustment is exemplified in Fig. 1 by illustrating the boom in full lines in one position and in dotted lines in a more elevated position. Referring now to Fig. 1, herein one terminal
 85 portion of the rope is provided with a hook 110, to which the load may be attached, and the rope leads therefrom in an upward direction over the sheave-wheel 80, and along
 90 the boom over the sheave-wheel 66, and in a downward direction to appropriate winding means, which will now be described, reference being had to Figs. 10 and 11.

In the present example, I have provided a rope-winding spool or drum in the form of
 95 a winch head 112, suitably mounted to turn on a base 114, the latter being appropriately secured to a bracket 116 herein having a collar portion 118 encircling and clamped
 100 about the mast 50 by one or more clamping bolts 120. The collar may be further secured to the mast as by a set screw 122. The base 114 affords a convenient casing for a suitable driving mechanism, herein including a
 105 worm gear 124 secured to the winch head 112 and meshing with a worm 126 (see Fig. 11) having a shaft 128. Power may be supplied to the latter from the transmission gear set 24 through any suitable mechanism, herein comprising a sprocket wheel 130 se-
 110 cured to the worm shaft and connected by a chain 132 (see Fig. 7) to a sprocket wheel 134, best shown in Fig. 9, secured to a shaft 136 which is supported in suitable bearings 138 mounted on the cross members 34. To
 115 the shaft 136 is also secured a second sprocket wheel 140 connected by a chain 142 (see Fig. 7) to a sprocket wheel 144 suitably driven by the gear set 24 by mechanism the details of which are not essential to
 120 my present invention.

It should now be evident that by winding the rope one or more turns about the winch head while the latter is rotating, and assum-
 125 ing the free end of the rope to be held in the hands of the operator, a load attached to the hook 110 may be lowered, and may be swung horizontally by swinging the boom. On the other hand, should it be desired to
 130 pull a load horizontally onto the load-re-

ceiving platform, this may be accomplished conveniently by simply leading the rope in a rearward direction from the winch head, as exemplified by the broken lines in Fig. 1 and attaching the free end of the rope to the load. The load may be drawn forward onto the platform in an obvious manner, the operator now taking up the slack between the winch head 112 and the sheave wheel 66.

Having thus described one embodiment of my invention, but without limiting myself thereto, what I claim and desire by Letters Patent to secure is:

1. In a jib crane, the combination of a load-receiving platform, a standard upstanding therefrom, and load-handling mechanism for drawing a load horizontally onto said platform or lifting the same onto or off said platform, said mechanism including a cable, a boom to which said cable may be led when the load is to be raised or lowered, and a capstan winch mounted on said standard, and having a winch-head about which said cable may be wound and from which said cable may be led in an upward direction to said boom or in a generally horizontal direction when a load is to be drawn horizontally onto said platform.

2. In a truck, the combination of a load-receiving platform, a standard upstanding therefrom adjacent the forward end thereof, and load-handling mechanism for drawing a load horizontally onto said platform or lifting the same onto or off said platform, said mechanism including a cable, a boom to which said cable may be led when the load is to be raised or lowered, and a winch mounted on said standard and having at the rear of the latter a winch-head about which said cable may be wound and from which said cable may be led in an upward direction to said boom or in a rearward direction when a load is to be drawn in a forward direction onto said platform.

3. In a jib crane, the combination of a load-receiving platform, a standard upstanding therefrom, a boom supported by said standard, a cable-winding drum supported by said standard, a cable leading from said drum to said boom, and drum rotating mechanism including driving means below said platform, and driven means leading from said driving means to said drum.

4. In a jib crane, the combination of a standard, a boom supported thereby, a bracket encircling and adjustably clamped to said standard, a winch having a winch-head supported by said bracket, winch-head driving mechanism including a driving connection which is adjustable by adjusting said bracket, and a cable leading from said winch-head to said boom.

5. In a jib crane, the combination of a standard, a mounting pivotally supported by said standard to turn about an upright

axis, an idle sheave and a boom carried by said mounting, a cable-winding drum, on said standard below said mounting and a cable leading from said drum in an upward direction over said sheave and outwardly along said boom.

6. In a jib crane, the combination of a standard, a mounting pivotally supported by said standard to turn about an upright axis, an idle sheave mounted on said mounting to turn about a horizontal axis, a boom mounted on said mounting to turn about a horizontal axis, means connecting said boom to said standard adjustably to support said boom with reference to its said axis, a cable-winding drum below said mounting, and a cable leading in an upward direction from said drum over said sheave and outwardly along said boom.

7. In a jib crane, the combination of a standard, a mounting pivotally supported by said standard to turn about an upright axis, a sheave mounted on said mounting to turn about a horizontal axis, a boom mounted on said mounting to turn about said horizontal axis, means adjustably to support said boom with reference to its said axis, and a cable leading over said sheave and outwardly along said boom.

8. In a jib crane, the combination of a standard, a mounting pivotally supported by said standard to turn about an upright axis outside of said standard, a drum mounted on said standard below said mounting, means supported by said standard for applying motive power to rotate said drum, a sheave and a boom carried by said mounting, and a cable leading from said drum in an upward direction about said sheave and outwardly along said boom.

9. In a jib crane, the combination of a standard, a mounting pivoted on said standard to turn about an upright axis outside of said standard and provided with an opening, a sheave and a boom carried by said mounting to turn about a common horizontal axis, means adjustably to support said boom with reference to said horizontal axis, and a cable leading in an upward direction with its axis substantially coincident with said upright axis, over said sheave and outwardly along said boom.

10. In a jib crane, the combination of a standard, an idle sheave and a boom mounted on said standard to turn about horizontal axes, a cable-winding drum, means for applying motive power to rotate said drum, a cable leading from said drum upwardly over said sheave and outwardly along said boom, and means connecting said boom to said standard adjustably to support said boom with reference to turning movement about its axis.

11. In a jib crane, the combination of a standard, an idle sheave and a boom mounted

on said standard to turn about horizontal axes, a cable winding drum, means for applying motive power to rotate said drum, a cable leading from said drum upwardly over
 5 said sheave and outwardly along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means including adjustably interengaging parts directly connecting and
 10 carried by said standard and said boom respectively.

12. In a jib crane, the combination of a standard, a support pivoted on said standard to turn about a vertical axis, an idle sheave
 15 and a boom mounted on said support to turn about horizontal axes, a cable winding drum, means for applying motive power to rotate said drum, a cable leading from said drum upwardly over said sheave and outwardly
 20 along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means including a part pivoted on said standard above said support to turn about an upright axis.

25 13. In a jib crane, the combination of a load-supporting platform, a standard rising from said platform, a mounting pivoted on said standard to turn about an upright axis, a sheave and a boom mounted on said mounting
 30 to turn about horizontal axes, a rope-winding drum mounted on said standard above said platform, a cable leading from said drum upward with its axis substantially coincident with said upright axis, over said
 35 sheave and outwardly along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means including a part pivoted on said standard to turn about an upright axis
 40 substantially coincident with the first-mentioned upright axis.

14. In a jib crane, the combination of a standard, a sheave and a boom mounted on said standard to turn about horizontal axes,
 45 a cable leading over said sheave and outwardly along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means including a chain comprising a series of
 50 links, and means adjustably interengageable with any one of a plurality of said links.

15. In a jib crane, the combination of a standard, a sheave and a boom mounted on said standard to turn about horizontal axes,
 55 a cable leading over said sheave and outwardly along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means including a chain comprising a series of
 60 links, and an element provided with at least one recess receiving at least one link of said chain and providing an adjustably interengageable connection therewith.

16. In a jib crane, the combination of a
 65 standard, a sheave and a boom mounted on

said standard to turn about horizontal axes, a cable leading over said sheave and outwardly along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means
 70 including a chain comprising a series of links, and an element provided with at least one projection received between adjacent ends of two of said links and providing an
 75 adjustably interengageable connection therewith.

17. In a jib crane, the combination of a standard, a sheave and a boom mounted on said standard to turn about horizontal axes,
 80 a cable leading over said sheave and outwardly along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means including a chain comprising a series
 85 of links, and an element provided with at least one recess receiving at least one link of said chain, and provided with at least one projection received between adjacent ends of two of said links and providing
 90 an adjustably interengageable connection therewith.

18. In a jib crane, the combination of a standard, a sheave and a boom mounted on said standard to turn about horizontal axes,
 95 a cable leading over said sheave and outwardly along said boom, and means adjustably to support said boom with reference to turning movement about its axis, said means including a pair of rods pivoted at
 100 one pair of ends to said boom, a hook pivoted to the other pair of ends of said rods, and means pivotally connected to said standard and having provision adjustably to receive said hook in any one of a series
 105 of positions.

19. In a crane, the combination of a base presenting a socket, a standard removably seated in said socket, means to secure said
 110 standard against movement in said socket, and load-handling mechanism carried by said standard.

20. In a crane, the combination of a base presenting a socket, a standard removably seated in said socket, fastening means interlocking with and securing said base and said
 115 standard together, and load-handling mechanism carried by said standard.

21. In a crane, the combination of a base presenting a socket, a standard removably seated in said socket, fastening means extending through a part of said base and a
 120 part of said standard and fastening the latter to the former, and load-handling mechanism carried by said standard.

22. In a crane, the combination of a load-receiving platform, a base presenting a
 125 socket mounted below the top of said platform, a standard removably seated in said socket, and load-handling mechanism carried by said standard.

23. In a jib crane, the combination of a standard, a cable, sheave wheels over which said cable passes, a boom supporting said sheave wheels, and means presenting a bearing and a pivot removably seated therein and providing a shaft for one of said sheave wheels and a detachable connection between said boom and said standard, having provision for dismounting said boom without disturbing such sheave wheel. 15

24. In a jib crane, the combination of a standard, a cable, sheave wheels over which said cable passes, a boom supporting said sheave wheels, and means presenting a pair of notches and a pivot removably seated therein and providing a shaft for one of said sheave wheels and a detachable connection between said boom and said standard. 20

In testimony whereof, I have signed my name to this specification.

ALMON E. NORRIS.