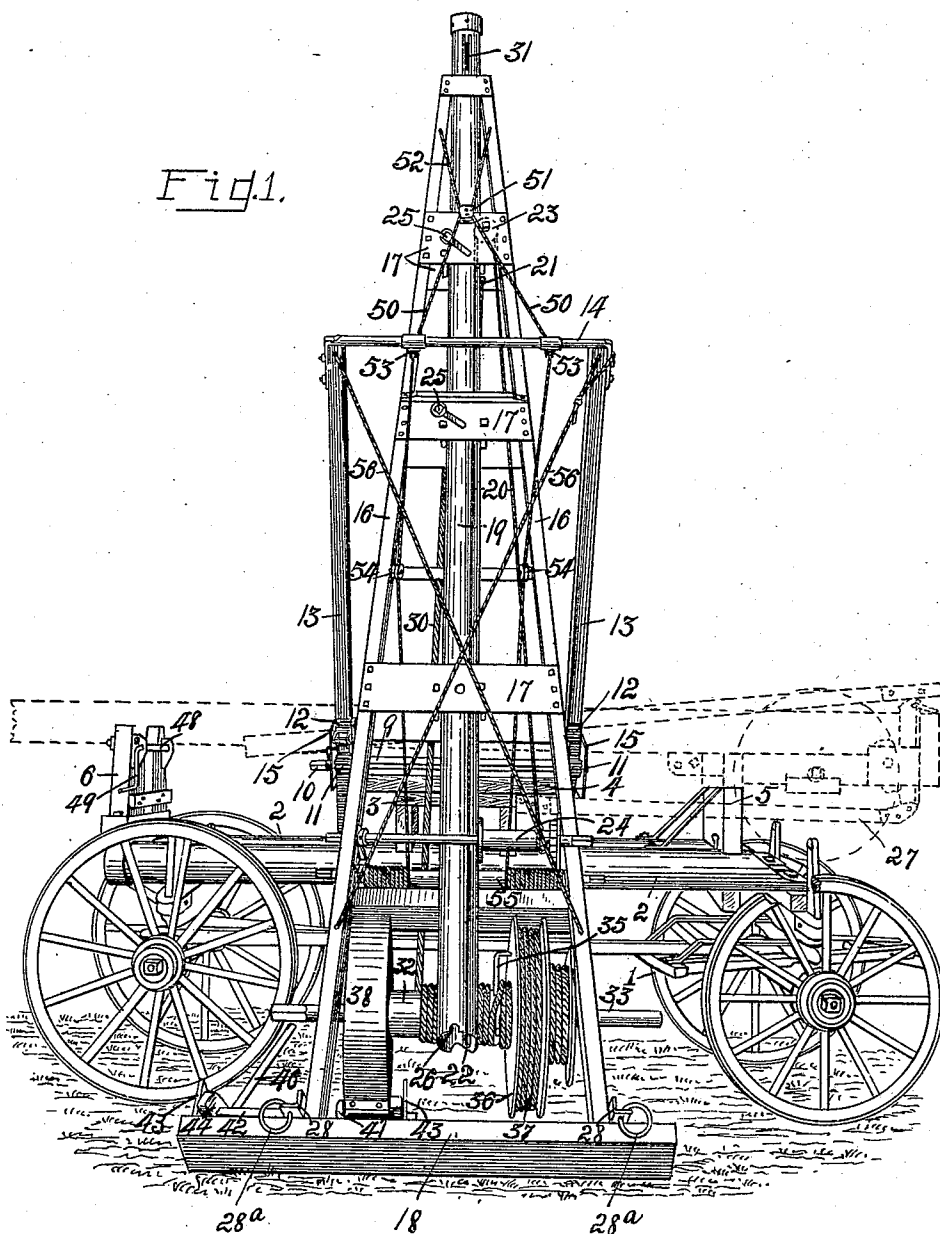


F. SANDWISCH.
HOISTING APPARATUS AND PORTABLE MOUNT THEREFOR.
APPLICATION FILED JULY 6, 1909.

988,034.

Patented Mar. 28, 1911.

3 SHEETS—SHEET 1.



WITNESSES:

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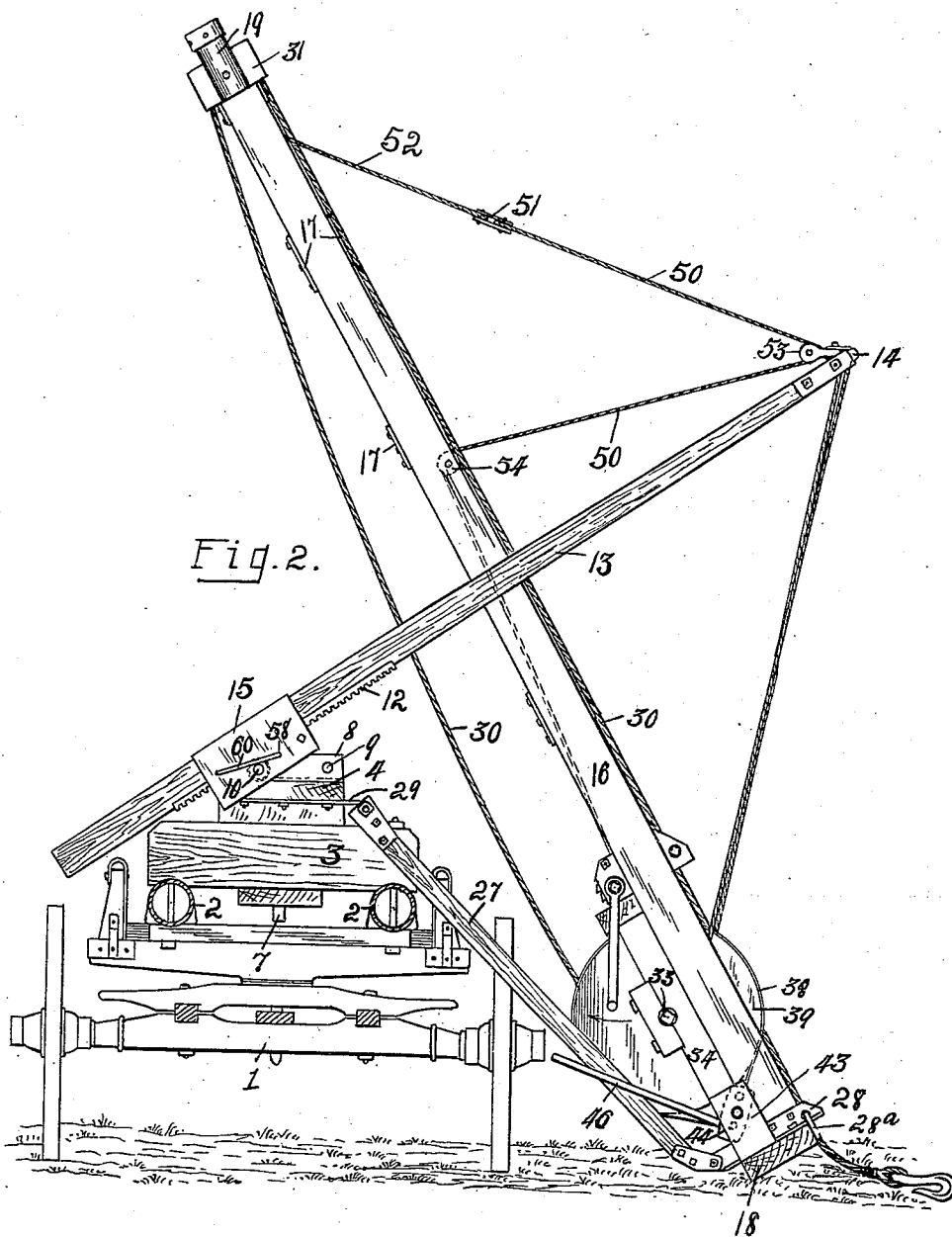
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 3.

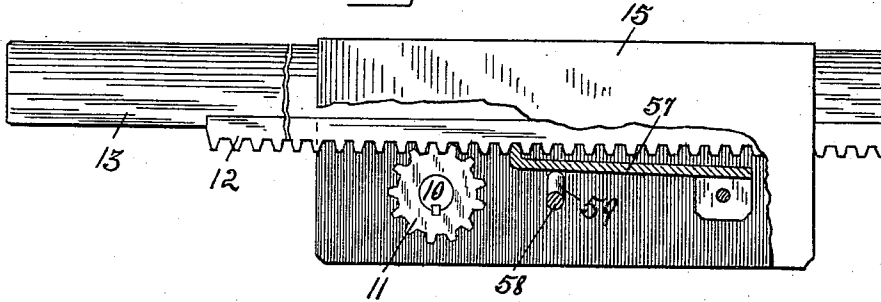


Fig. 4.

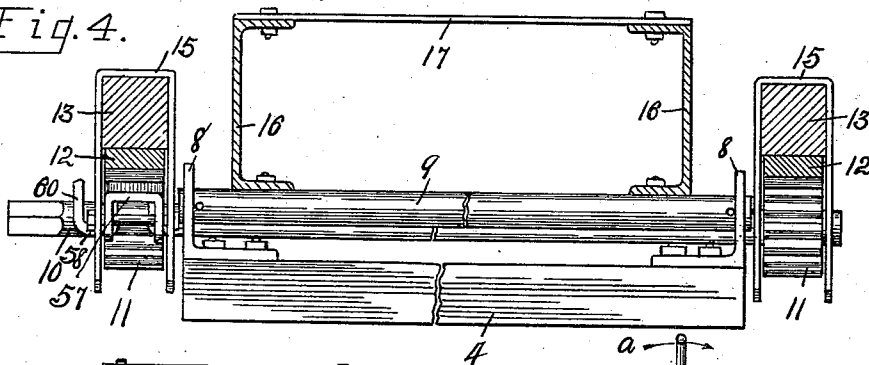


Fig. 5.

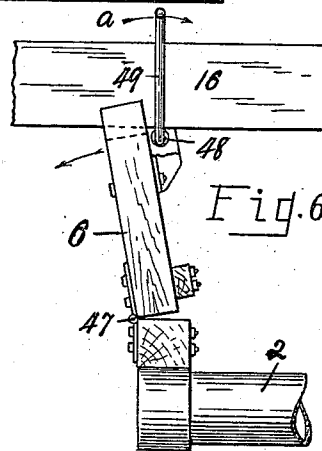
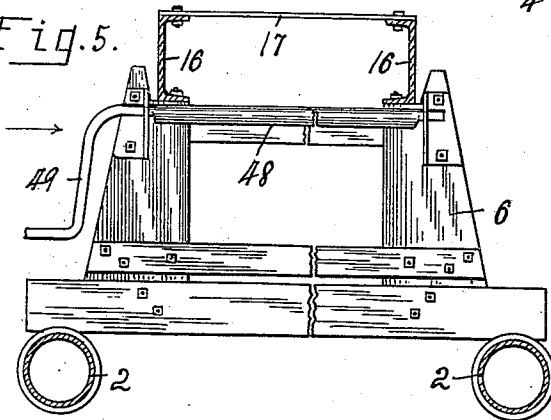
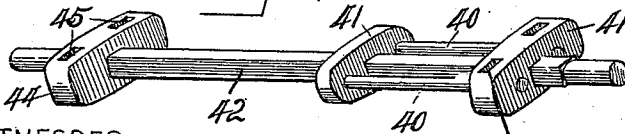


Fig. 7.



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UNITED STATES PATENT OFFICE.

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HOISTING APPARATUS AND PORTABLE MOUNT THEREFOR.

988,034.

Specification of Letters Patent.

Patented Mar. 28, 1911.

Application filed July 6, 1909. Serial No. 506,250.

To all whom it may concern:

Be it known that I, FREDRICK SANDWISCH, a citizen of the United States, and a resident of Woodville, in the county of Sandusky and State of Ohio, have invented a certain new and useful Hoisting Apparatus and Portable Mount Therefor; 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to hoisting machines, and more particularly to those of the portable type which are adapted for the lowering of sucker rods, tubing or other parts into oil or other classes of wells, or for raising such parts therefrom, but is not restricted to such use, and also has reference to improvements upon the hoisting apparatus described and claimed in United States Letters Patent, No. 863,098, granted to me on August 13, 1907.

The object of my invention is the provision of an improved, simple and highly efficient apparatus of this class, which is strong and durable in its construction, and capable of being easily and quickly raised to operative position or lowered to inoperative position, as may be desired.

Further objects of the invention as well as the operation, construction, and arrangement of the parts thereof are fully described in the following specification, and a preferred embodiment of the same is illustrated in the accompanying drawings, in which,—

Figure 1 is a front view of the derrick embodying the invention, the same being partly raised to upright position at one side of the transporting means. Fig. 2 is a cross-section of the transporting means with the derrick partly raised. Fig. 3 is an enlarged view of a portion of the rack or elevating frame and associated actuating parts with portions in section. Fig. 4 is a cross-section of the derrick and rack-frame in reclining positions, such section being taken in advance of the center bolster or turn-table of the transporting means. Fig. 5 is a cross-section of the transporting means taken immediately in advance of the rear bolster for the derrick, with the derrick resting

thereon. Fig. 6 is a side view of the same with the bolster partly open, and Fig. 7 is an enlarged perspective view of the rock-shaft and attached arms of the brake mechanism.

Referring to the drawings, 1 designates the running-gear of a suitable vehicle forming the transporting means for the derrick, and 2, 2 beams which extend longitudinally thereof with their ends resting on and bolted to the bolsters of the vehicle, said beams being preferably formed of tubing, as shown. These beams rigidly support the center bolster 3 to which the turn-table 4 is pivoted, and the end bolsters 5 and 6, which are disposed at opposite ends of the vehicle and intended to form pillow-blocks on which the derrick rests when in horizontal or reclining position.

The turntable 4 turns on a pivot-bolt 7, projecting therefrom through the bolster 3, and has its ends provided cross-wise thereof with strips 8, preferably of angle-iron, one flange of each of which projects upwardly and forms bearings for the contiguous ends of the roller 9 and pinion-shaft 10. A pinion 11 is mounted on each end of the shaft 10, and each is in mesh with a superimposed rack 12, which is secured to the underside of a bar 13 on the side of the turntable there-with. The bars 13 carry the racks 12 near one end thereof and have their opposite or forward ends connected by a cross-piece 14 to form a U-frame, as shown.

The racks 12 are held in mesh with their pinions by inverted U-shaped straps or bands 15 which slidably embrace the tops and sides of the bars 13 and have their lower edges pivoted to the shaft 10, see Figs. 2, 3, and 4.

In the present instance, the derrick is shown as comprising a body and a mast slidably mounted thereon, which are similar in construction and operation to the form described in my said former Letters Patent. The body is of A-frame construction, consisting of spaced convergently-disposed side standards 16, which are preferably of channel-iron and connected at intervals by opposing cross-braces 17, and have their lower ends secured to a foot 18.

A mast 19 is mounted for longitudinal sliding movements between the standards 16 and sets of cross-braces 17. This mast has its longitudinal movements relative to the

derrick body controlled by a cable 20, which attaches at one end to a cross-brace 17, as at 21, thence extends down under a sheave at the lower end of the mast, as at 22, and upward therefrom over a sheave carried by a cross-brace 17, as at 23, and then down to a windlass 24 to which it attaches. It is thus apparent that a turning of the windlass will effect either a raising or a lowering of the mast relative to the derrick body as may be desired. The mast 19 is held in elevated position by one of the bolts or pins 25 co-operating with the notch 26 in the lower end of the mast in a manner similar to that described in said former patent.

The foot 18 of the derrick body is pivotally connected to the turntable 4 by a set of bars 27, which hinge at one end to strips 28 projecting from the foot and at their other ends to arms 29 projecting from the side of the turntable. The bars 27 brace the base of the derrick relative to the vehicle and are of suitable length to permit the derrick to rest on the ground at one side of the vehicle as indicated in Fig. 2.

The angle iron strips 28 serve to rigidly connect the bases of the standards 16 to the foot 18, and have their forward ends projected a suitable distance in advance of the foot 18 to receive a ring 28^a, to which an anchoring chain (not shown) is attached, and their rear ends, to which the bars 27 are attached, projected rearwardly from the foot a suitable distance to form rests, which, when the derrick is inclined against the roller 9 of the turntable, bear against the ground and elevate the base of the derrick sufficiently to prevent contact of the brake and bull-wheels thereof with the ground. It is thus seen that each of the strips 28 performs a four-fold purpose.

30 designates the hoisting cable, which passes over a sheave 31 at the upper end of the mast 19 and has one end attached to and wound upon a drum 32, the shaft 33 of which is journaled in the side pieces of a frame 34 secured to the base portion of the derrick body. An unwinding of the cable 30 from the drum may be limited to stop at any desired point of such unwinding by inserting a pin 35 into the desired one of a number of sockets provided in the drum 32, the outer end of which pin is bent to form a lateral extension, which is disposed longitudinally of the drum and adapted to engage the cable at a predetermined point in its unwinding movement and stop such unwinding.

36 designates the spool or bull-wheel on which the draft-cable 37 winds.

The rotation of the drum 32 is controlled by a brake-band 38, which surrounds the brake-wheel 39 and has its ends attached to pins 40, which are carried by cross-arms 41, 41 at opposite sides of a rock-shaft 42, to

which such arms are secured. The shaft 42 is disposed beneath the brake wheel 39 and has its ends journaled in bearings 43 carried by the foot 18 of the derrick body. The outer end of the shaft is provided with a cross-piece 44 having sockets 45, preferably disposed near the ends thereof, for receiving an end of a controlling-lever or handle 46, see Figs. 1 and 2. The outer cross-piece 41 is also provided in its top with sockets 45 to enable the handle 46 to be placed in engagement with either one of the socketed pieces 41, 44 at either end thereof as may be most convenient to the operator. It is apparent that this manner of controlling the brake-band provides a very efficient and quick acting brake, as the shaft 42 may be rocked in either direction, to effect a setting of the brake, and releases the same when in neutral position.

The rear bolster 6, on which the derrick rests when in reclining position, as shown by dotted lines in Fig. 1, is hinged at its base, as at 47, Fig. 6, to enable it to be swung outwardly from under the derrick to permit the rear end of the derrick to be lowered so as to raise the forward end thereof sufficiently to enable it to be swung laterally of the vehicle. The bolster 6 is provided with a cam-roll 48 having a crank handle 49, which roll when turned in the direction indicated by the arrow *a* in Fig. 6 is adapted to raise the derrick out of contact with the bolster 6, and by its rolling action on the derrick to effect a rearward swinging movement of the bolster, as indicated in Fig. 6, thus opening the bolster sufficiently to enable it to lower the remaining distance by gravity. Without the provision of the cam-roll 48 the lowering of the bolster 6 when the derrick is resting thereon would be very difficult.

When the derrick has been swung cross-wise of the vehicle and its base lowered to rest on the ground at the side of the vehicle, as shown, the U-frame, formed by the bars 13 and cross-piece 14, is run out by a turning of the pinion shaft 10 until its looped end is disposed slightly in advance of the vertical plane of the derrick base. The derrick is then raised to vertical or other desired upright position by a cable 50, which is looped around a pulley, the block 51 of which is anchored to the upper end of the derrick body by a cable 52. The cable 50 thence has its ends passed around sheaves 53, 53 carried by the cross-piece 14 of the U-frame, thence around sheaves 54, 54 carried by the side standards 16 of the derrick body, and then passed down to and wound in the same direction on a windlass 55. The raising movement of said U-frame relative to the derrick is limited by guy-cables 56, 56, which attach at their upper ends to the upper ends of the bars 13 and cross each

other, and each has its lower end attached to the opposite standard 16 of the derrick body a short distance above the lower end thereof, as shown in Fig. 1. The guy-cables 56, 56 are of suitable length to anchor the outer end of the U-frame in such position that the sheaves 53 stand in substantially the arc of raising movement of the sheaves 54, thus guiding the course of the cable 50 so that it has a maximum lifting power on the derrick. It is apparent that a turning of the windlass 55 to shorten the cable 52 will raise the derrick toward the cross piece 14 of the U-frame and that the guy-cables 56 will oppose the lifting action of the raising cable 52 and will also assist the cable 50 to raise the derrick. The crossing of the guy cables 56 is an important feature in the proper bracing of the U-frame as they serve to rigidly brace the frame against lateral as well as a vertical raising movement. Should it be found that the U-frame has not been run out sufficiently to permit the raising of the derrick to the desired erect position, the frame can be run out the required distance by a turning of the pinion shaft 10 in the proper direction.

As it is important to provide some means for locking the U-frame in adjusted position I have provided a simple mechanism for such purpose. This mechanism consists in pivoting a dog or pawl 57 between the legs of one of the U-straps 15, see Figs. 3 and 4, and providing its free end with a tooth adapted to be moved by an oscillation of such dog into a registering notch of the associated rack-bar 12. A shaft 58 is journaled in the sides of the strap 15 and has an offset portion 59 beneath the arm 57, which when the shaft is turned in one direction moves the arm 57 into position for its tooth to engage a notch of the rack-bar 12, as shown in Fig. 3. The shaft 52 is provided at its outer end with a crank-handle 60.

It is apparent that the derrick of my machine is capable of being easily and quickly set up in operative position or folded in reclining position upon the vehicle for the purpose of transportation, and that when set up it provides a very efficient hoisting mechanism.

I wish it understood that my invention is not limited to any specific construction or arrangement of the parts except in so far as such limitations are specified in the claims.

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

1. In an apparatus of the class described, the combination with a portable mount, of a derrick associated therewith, a U-frame, and cables connecting the loop end of said frame and the base portion of the derrick above its fulcrum when in upright position and capable of cooperating with the frame to effect a

raising or lowering of the derrick relative to the mount, and means for adjusting the position of said frame.

2. In an apparatus of the class described, the combination with a portable mount, of a derrick, means pivotally connecting the derrick base and mount, a pair of bars carried by the mount on opposite sides of the derrick and having their forward ends connected, rack and pinion mechanism for effecting a longitudinal adjustment of said bars, said bars having their connected ends anchored to the derrick above the fulcrum thereof when in upright position, and a windlass and cable cooperating with said bars, anchor means and derrick and operative to effect a raising or lowering of the derrick relative to the mount.

3. In an apparatus of the class described the combination of a derrick, a portable mount therefor, bars longitudinally adjustable relative to the mount, crossed cables connecting the outer ends of the bars with the lower portion of the derrick, and means cooperating with the derrick and said bars and cables to effect a raising of the derrick at the side of the mount.

4. In an apparatus of the class described, the combination of a derrick, a portable mount on which the derrick is adapted to recline, bolsters on the mount on which the derrick rests, one of said bolsters being hinged, and means carried by the hinged bolster and movable to raise the derrick out of contact with the bolster.

5. In an apparatus of the class described, a derrick, a portable mount therefor, bolsters on the mount on which the derrick rests when in reclining position, one of said bolsters being hinged to the mount, and means carried by the hinged bolster and movable to raise the derrick above such bolster and to move the bolster on its pivot.

6. In an apparatus of the class described, the combination of a derrick, a portable mount therefor, bolsters carried by said mount on which the derrick rests when in reclining position, one of said bolsters being hinged to the mount, a cam-roll carried by said hinged bolster and adapted when rotated to effect a raising of the derrick from such mount and a lowering of the mount on its pivot.

7. In an apparatus of the class described, the combination with a derrick, of a cable drum, a cable winding thereon, and a pin projecting from such drum and having its outer end angled longitudinally of the drum and coacting with the cable when unwinding from the drum to limit such unwinding.

8. In an apparatus of the class described, the combination of a cable drum having sockets therein and a cable wound on said drum, of a pin mounted in one of such sockets and projecting radially from the

drum, said pin having its outer end angled longitudinally of the drum to engage the cable at a predetermined point in its unwinding movement to limit such unwinding.

5 9. In an apparatus of the class described, the combination with a derrick, of a raising frame, a sheave carried by the derrick, a sheave carried by the outer end of the raising frame in substantially the arc of movement of the sheave on the derrick when the
10 derrick is being raised, and a cable attached to the upper end of the derrick, and means carried by the derrick and cooperating with said sheave and cable to effect a raising of
15 the derrick when such cable is shortened.

10. In an apparatus of the class described, the combination with a derrick, of an elevating frame inclined relative to a horizontal plane, and straddling the derrick, sheaves
20 carried by the derrick, sheaves carried by the elevated end of such frame in the arc of movement of the first mentioned sheaves when the derrick is raised, a windlass carried
25 by the derrick, and a cable anchored to the upper end of the derrick and cooperating with said sheaves and attached to said windlass whereby a turning of the windlass in one direction will effect an elevating of
the derrick.

30 11. In an apparatus of the class described, the combination with a derrick, of a U-frame straddling such derrick and capable of longitudinal adjusting and vertical oscillatory movements, sheaves carried by the
35 derrick, sheaves carried by the outer end of said frame and disposed in the arc of movement of the derrick sheaves when the derrick is raised, a cable attached to the upper end of the derrick and operating over
40 said sheaves, and means carried by the derrick for shortening such cable to effect a raising of the derrick.

12. In an apparatus of the class described, the combination with a derrick pivoted at its base, of a U-elevating frame straddling
45 the same and having its looped end elevated in advance of the derrick when in inclined position, a cable attached to the derrick and adapted to cooperate with said frame to effect a raising of the derrick, and a set
50 of cables crossing each other and attaching at their upper ends to opposite sides of the elevated end of said frame and at their lower ends to opposite sides of the derrick adjacent its base but above the fulcrum
55 thereof, said set of cables serving to oppose an elevation of the elevated end of the frame when the derrick is being elevated and to assist said first mentioned cable in elevating the derrick.
60

13. In an apparatus of the class described, the combination of a derrick, a set of rack-bars connected at their outer ends and disposed on opposite sides of the derrick, means
65 carrying said bars for vertical and horizontal swinging movements, means for longitudinally moving said bars relative to the carrying means, a cable attached to the upper end portion of the derrick, thence extending
70 to and coacting with the outer connected ends of the rack-bars, thence extending back to the derrick, and thence continuing down the derrick, means attached to said bars and derrick for guiding the course of said cable, and a windlass upon which the lower end
75 of the cable winds, substantially as described.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

FREDRICK SANDWISCH.

Witnesses:

C. W. OWEN,
CORNELL SCHREIBER.