No. 808,632. PATENTED JAN. 2, 1906.

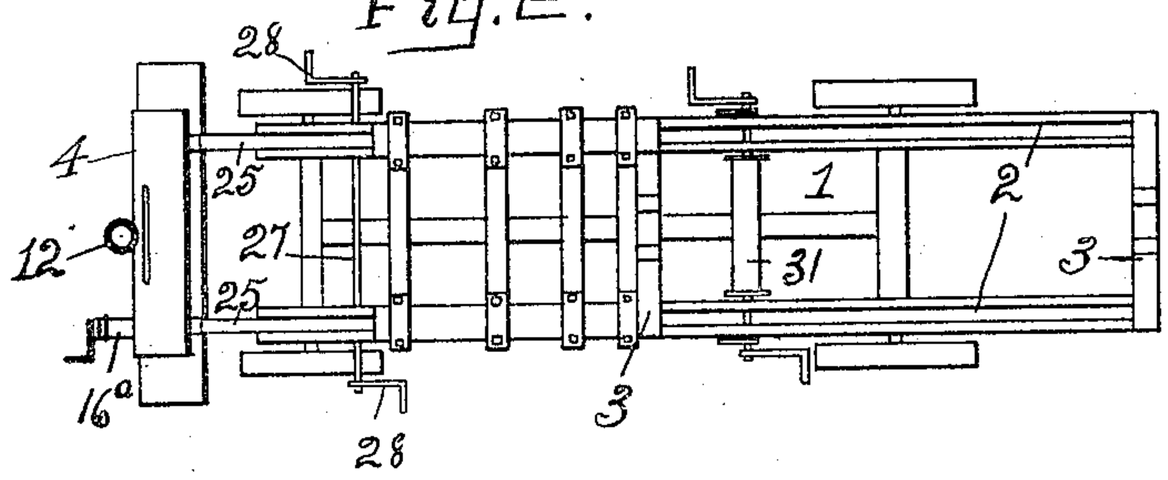
W. M. BROWN.

HOISTING MACHINE.

APPLICATION FILED JUNE 9, 1905.

2 SHEETS—SHEET 1.

Fig. 2a.



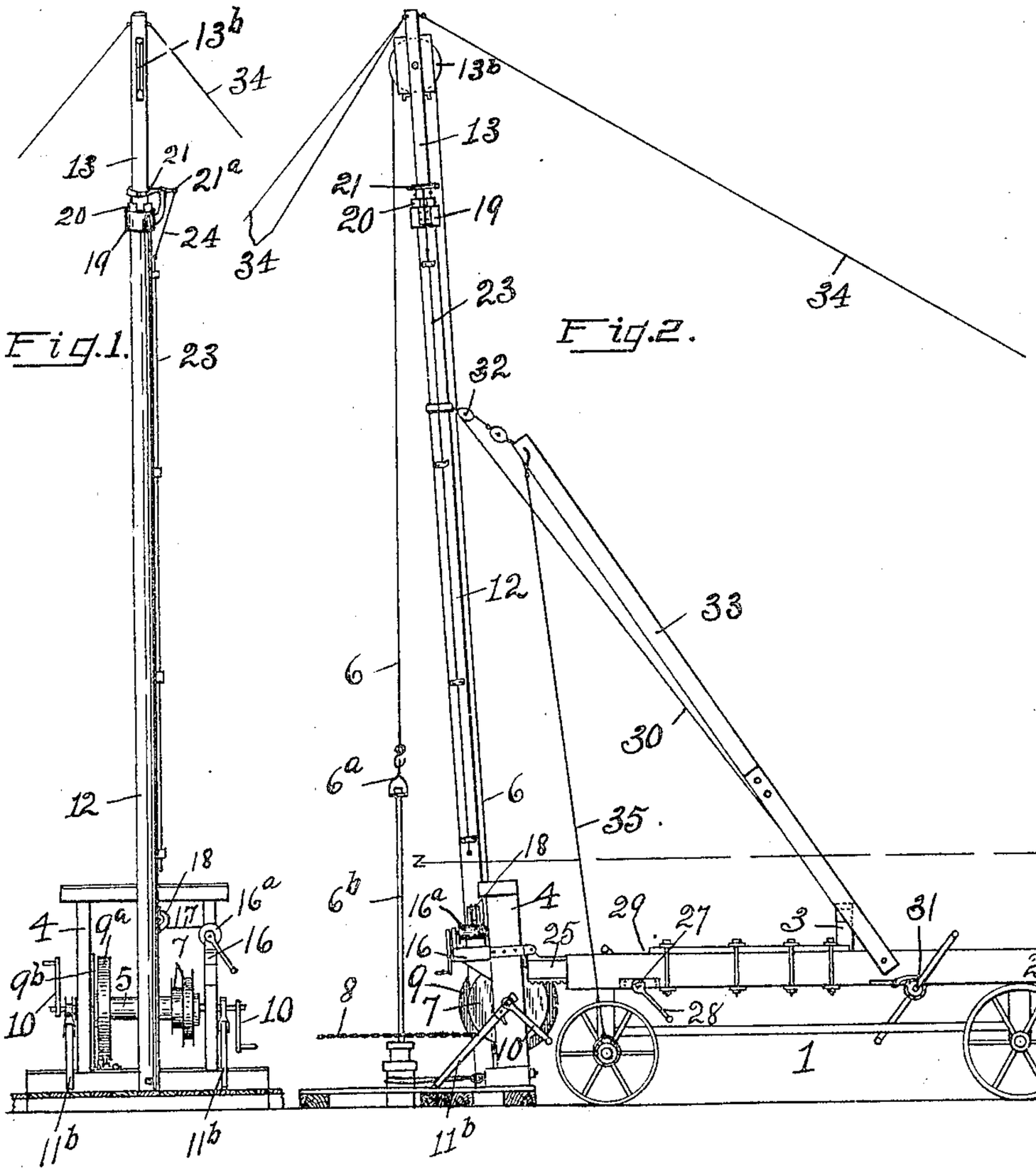


Fig. 1.

Fig. 2.

WITNESSES:
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2 SHEETS—SHEET 2.

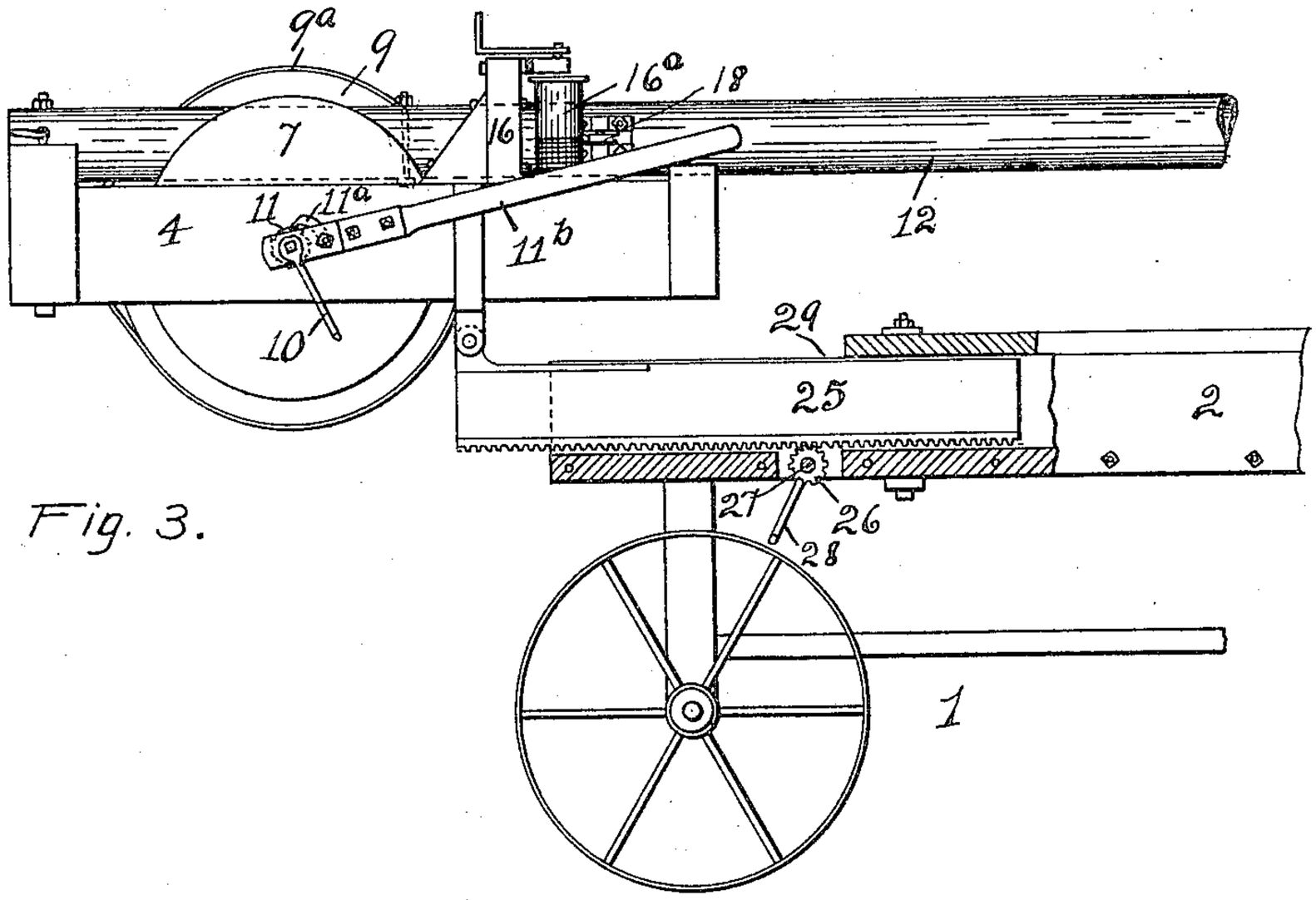

Fig. 3.

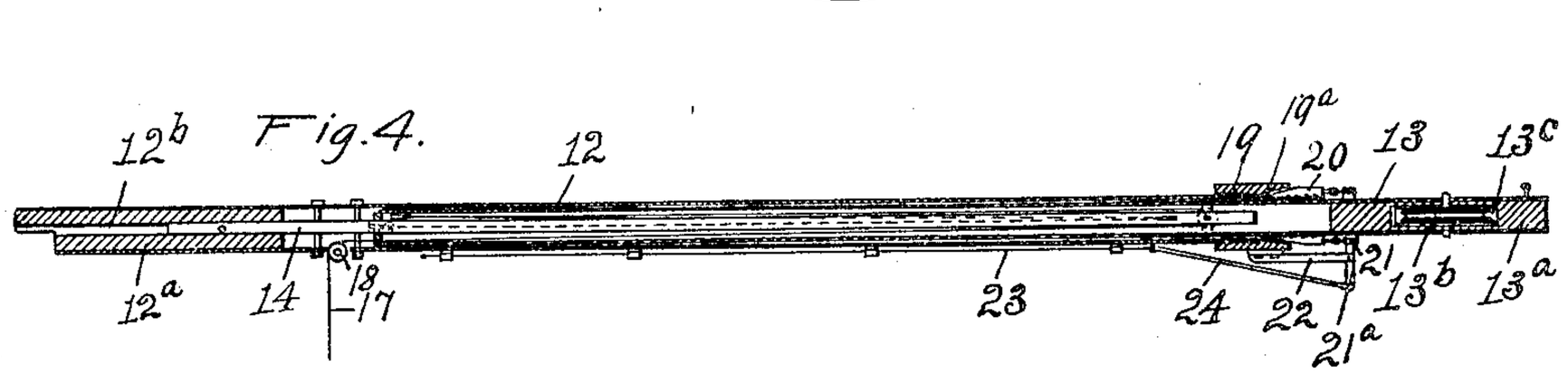

Fig. 4.

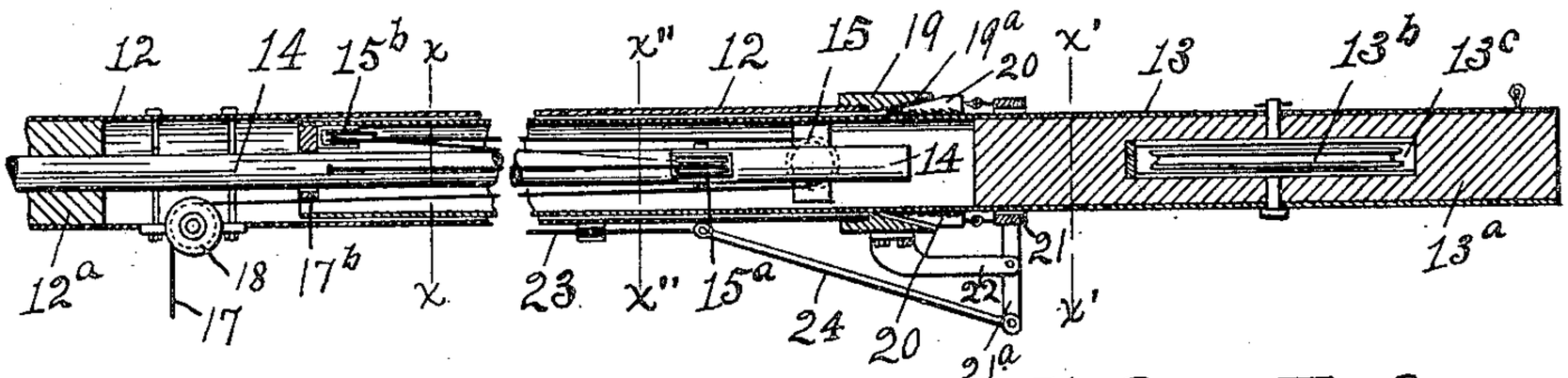

Fig. 5.

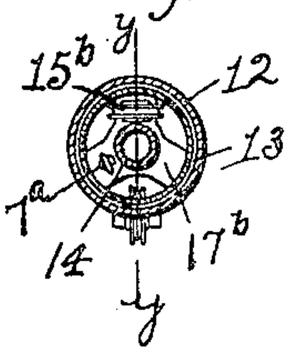

Fig. 6.

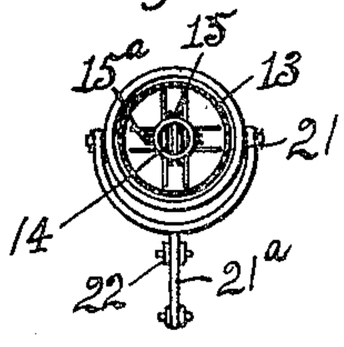

Fig. 7

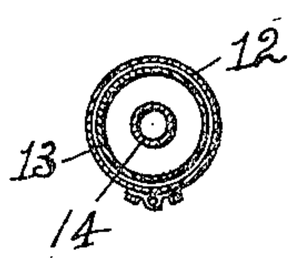

Fig. 8.

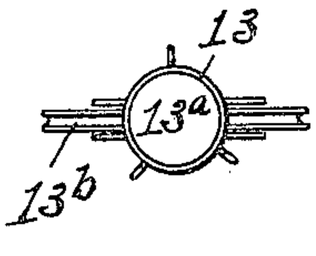

Fig. 9.

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UNITED STATES PATENT OFFICE.

WILLIAM M. BROWN, OF GIBSONBURG, OHIO.

HOISTING-MACHINE.

No. 808,632. Specification of Letters Patent. Patented Jan. 2, 1906.

Application filed June 9, 1905. Serial No. 264,399.

To all whom it may concern:

Be it known that I, WILLIAM M. BROWN, a citizen of the United States, and a resident of Gibsonburg, in the county of Sandusky and State of Ohio, have invented certain new and useful Improvements in Hoisting-Machines; 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 means of the class more especially employed for elevating and lowering sucker-rods, pipes, or other apparatus into oil or other wells, or for raising such apparatus therefrom, but is not confined to this use, as it may be used for other purposes for which hoisting-derricks are employed, and it also relates to improvements on the construction described and claimed in United States Letters Patent No. 767,135, granted to me August 9, 1904.

The object of my present improvement is to provide means whereby the cable-supporting pole or mast may be easily and quickly shortened or extended as the nature and requisites of the work may require, the extended portion of the pole or mast being automatically gripped by supplemental locking means as the weight of an article being hoisted or lowered is applied thereto, thus relieving the strain from the adjusting mechanism.

A further object of my invention is the provision of means for adjustably mounting the pole or mast, whereby it and the associated operating mechanism may be adjusted with respect to the supporting vehicle or standard, as hereinafter described.

Further objects and advantages of my invention, together with the operation, construction, and arrangement of the parts, are fully described in the following specification and shown in the accompanying drawings, in which—

Figure 1 is a front elevation of the mast or pole of my invention with its associated operating mechanism and cable-winding drum. Fig. 2 is a side elevation thereof set up in operative position. Fig. 2^a is a plan view thereof, taken on the dotted line $z\ z$ in Fig. 2. Fig. 3 is a partial side elevation of the apparatus embodying my invention with the mast and associated mechanism shown in knocked-down or horizontal position on its supporting-vehicle and a portion of the vehicle-frame shown in section to disclose the mast-adjusting means. Fig. 4 is a central longitudinal section of the mast of my invention in closed position and showing the means for adjusting the telescoping sections thereof. Fig. 5 is a similar view, on an enlarged scale, with portions broken away. Figs. 6, 7, and 8 are cross-sections of the mast, taken on the dotted lines $x\ x$, $x'\ x'$, and $x''\ x''$, respectively, in Fig. 5; and Fig. 9 is a top plan view of the mast.

Referring to the drawings, 1 represents a wheeled vehicle having the laterally-spaced longitudinally-extending hollow beam members 2 2, forming the vehicle-frame, which are connected at intervals by the transverse pieces 3, having seats formed in their upper surfaces for receiving and supporting the pole or mast of the machine when in incumbent position.

Pivotally mounted to one end of the frame of the vehicle in a manner adapted to permit of its being placed in suspended vertical or in horizontal position is a frame member 4, shown in the drawings as being rectangular in form and carrying the winding drum or reel 5, to which the hoisting-cable 6 is secured, said cable being either double, as shown and described in my former Letters Patent, No. 767,135, or single, as shown in the drawings. At one side of the drum or reel 5 on the shaft therewith is provided one or more drums 7 of varying sizes, to which a power cable or chain 8 is secured and adapted when a pull is exerted thereon to impart rotation to the drum or reel 5 for winding up the cable 6, while at the other side of the drum or reel 5 is secured a disk 9, having its periphery engaged by a brake-band 9^a, which is caused to frictionally coact with said disk when power is applied thereto through the medium of the brake-lever 9^b. On each end of the shaft with the drum or reel 5 is mounted a crank 10 and a ratchet-wheel 11, with which the pawl 11^a, carried by the lever 11^b, engages, said lever having its end pivotally mounted to the shaft, thus enabling considerable power to be exerted on the shaft for turning the winding-drum 5 when it is desired to impart a limited rotation thereto independent of the main operating means for the purpose of raising the object being lowered, so that its upper end projects a short distance above the pipe-casing of the well to enable the elevator 6^a, connecting the free end of the cable therewith,

to be removed from the end of the sucker-rod or other objects 6^b.

Arising from the frame member 4 at right angles to the drum or reel 5 is a mast or pole which acts as a supporting means for the hoisting-cable 6 and is adapted to move with said frame to either horizontal or vertical positions. This mast has its base bolted or otherwise rigidly secured to the frame 4 and is shown as comprising the lower and upper hollow sections 12 and 13, respectively, the latter of which telescopes within and is made adjustable with respect to the lower section. The lower end of the base-section 12 and the upper end of the top or adjustable section 13 are preferably closed by a filling member 12^a and 13^a, respectively. A sheave 13^b, over which the hoisting-cable 6 passes, is mounted in a slot 13^c, provided through the upper end of the section 13 of the mast.

Disposed axially within the base-section 12, with its lower end fixed within an axial bore 12^b in the filling member 12^a, is the elevating-pole 14, the upper end of which extends within the lower end of the section 13 and approximately to the top of the section 12. Mounted in superimposed position adjacent to the upper end of the pole 14 are the two sheaves or grooved pulleys 15 and 15^a, turning on horizontal axes and shown as being substantially at right angles to each other, while a third sheave or pulley 15^b is mounted to the mast-section 13 within its lower end, as shown in Figs. 4 and 5. Mounted in a bracket 16, projecting from one side of the frame 4, is a windlass 16^a, upon which the mast-elevating cable 17 is wound, from whence the cable extends under the sheave 18, which is mounted in a vertical slot or opening provided in the lower portion of the base of the mast, thence upward over the sheave 15, and down under the sheave 15^b, and up again over the sheave 15^a, the end thereof being finally fixed to the pole 14 at a point below the sheave 15^a, or to a hook 17^a, secured to the guide member 17^b at the lower end of the mast-section 13, as shown in Fig. 6. It is thus apparent that when the mast-sections are in closed position an elevating of the top section may be readily accomplished by winding up the cable 17, which causes the lower end of the movable mast-section 13 to approach the sheaves 15 and 15^a on the pole 14.

Threaded to the upper end of the mast-section 12 is a collar 19, which has its upper portion extending above the end of said section and its inner periphery conically shaped, as shown at 19^a, to receive the tapered portion of a conical collar or a series of wedge members 20, which are suspended from a yoke 21, loosely encircling the top section 13, and have their inner surfaces serrated, as shown, to adapt them to more tightly grip the section 13 when they are forced down within the coacting tapered portion of the fixed collar 19. The normal frictional resistance of the collar or wedge members 20 on the surface of the adjustable mast-section 13 is sufficient to cause said collars or members to be forced downward within the conical seat provided by the collar 19 by a lowering movement of said mast-section, thus causing the section to be locked in adjusted position as soon as a strain sufficient for such purpose is exerted on the hoisting-cable 6. The yoke 21 is formed with a laterally-projecting arm 21^a, which is pivoted to the bracket 22, arising from the collar 19, and has its outer end connecting with a trip-line 23 through the medium of the link 24. A most important advantage incident to the manner of adjusting and locking the mast-section 13, as above described, is due to the fact that said section is permitted to turn within the base-section 12 to enable the sheave 13^b to adjust itself to the direction of pull of the hoisting-cable before the section 13 is forced down and locked in rigid position by reason of the wedge members 20 coacting with the collar 19, thus avoiding the wear on the hoisting-cable that would otherwise be occasioned by the binding thereof on the flanges of the sheave 13^b, due to a lateral or indirect pull thereon.

In order that the position of the mast may be longitudinally adjusted with respect to its supporting-vehicle, the frame 4 is pivoted at each side to a rack 25, said racks being mounted to have a longitudinal movement within the ends of the hollow beam members 2 of the vehicle and having their under surfaces toothed to mesh with pinions 26, carried by the shaft 27, which is mounted transversely of the vehicle-frame and is provided on its ends with the cranks 28. The top of each beam member 2 is open a sufficient distance back from the mouth of their forward end opening, as shown at 29, to permit a rearward longitudinal movement of the mast, when in reclining position, sufficient to position the forward end of the frame 4 in substantial vertical alinement with the ends of the beam members 2, thus enabling the horses or motive power of the vehicle to be attached closer to the end thereof.

The mast is raised from a reclining position to vertical or erect position by means of the cable 30, which winds on a windlass 31, and has its fixed end passed through a pulley-block 32 on the mast and secured to the upper end of the upright member 33, which latter is pivoted to the frame of the vehicle to adapt it to be folded in horizontal position thereon when the mast is down. The mast may be steadied when in erect position by means of a series of guy-ropes 34, which connect to the upper end thereof. A rope 35 may also be employed to steady the upright member 33, if desired.

The operation of my invention is as follows: Preparatory to raising the mast from its re-

clining position on the vehicle the cranks 28 are turned to extend the frame a desired distance from the front end of the vehicle-frame, after which the uprights 33 are elevated and the mast raised to erect position by a turning of the windlass 31. The top section 13 of the mast is then elevated to the desired height by a turning of the windlass 16[a], thus shortening the cable 17 and causing the lower end of the mast-sections 13 to be drawn upward toward the sheaves 15 and 15[a] on the elevating-pole 14. As the hoisting-cable 6 is attached to the object to be elevated for the purpose of lowering it into a well and power is applied to the drum or reel 5 for winding said cable thereon, the top section 13 of the mast instantly adjusts itself so that the sheave 13[b] thereon is disposed in the direct line of pull of the cable, after which said section sinks sufficiently within the lower section 12 to cause the slips or wedge members 20 to be forced in rigid contact therewith by the action of the companion collar 19, thus preventing the further descent of said top section. When the shaft-section 13 has been thus locked, it can only be released by a turning of the windlass 16[a] sufficient to raise the wedge members 20 from contact with the coacting surface of the collar 19. When the rigid grip of the members 20 on the mast-section has been thus released, the lowering of the top section within the lower section can be effected by pulling down on the trip-cord 23, thus retaining the wedge members 20 out of contact with the collar 19 during the lowering operation.

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

1. In a hoisting-machine, a mast having telescoping sections, means for longitudinally adjusting said sections, and means for automatically locking the sections in adjusted position when strain is applied to the top section, said means being adapted to permit the sections to have a relative turning movement to adjust the top section to the line of pull of the hoisting-cable before locking the sections in adjusted position.

2. In a hoisting-machine, a mast comprising relatively adjustable telescoping sections, means for adjusting the sections, and means coacting with the opposing surfaces of the sections for automatically locking the sections in rigid adjusted position when a hoisting strain is applied to the top section.

3. In a hoisting-machine, a sectional longitudinally-extensible mast, means for extending the mast adapted to permit the top section to adjust itself to the line of pull of the hoisting-cable, and means operated by the strain on the top section for causing the sections to be locked in adjusted position and against independent rotary movement.

4. In a hoisting-machine, a mast comprising a base-section and a movable top section, means for elevating the movable section adapted to permit it to adjust itself to the line of pull of the hoisting-cable, and means actuated by a lowering movement of the top section for locking it both in elevated position, and adjusted position relative to the line of pull of the hoisting-cable.

5. In a hoisting-machine, a mast comprising a plurality of telescoping adjustable sections, and means inclosed within the sections and operated from without the same for causing an adjustment thereof said means comprising an element fixed within the lower section and projecting within the upper section and a cable operating on said element and in connection with the upper section whereby a tightening thereof causes the top section to be elevated.

6. In a hoisting-machine, a mast comprising a plurality of telescoping adjustable sections, means inclosed within the sections and operated from without the same for causing an adjustment thereof, and means coacting with the opposing surfaces of the sections for automatically locking the sections in adjusted position.

7. In a hoisting-machine, a mast comprising a hollow base-section and a top telescoping section, an elevating-pole inclosed within the base-section, and projecting within the top section, a cable supported by said pole and having connection with the lower end of the top section whereby a tightening thereof causes said top section to be elevated.

8. In a hoisting-machine, a mast comprising a hollow base-section and a top telescoping section, an elevating element fixed within the base-section and projecting within the top section, a cable supported by said element and having connection with the lower portion of the top section whereby the top section is permitted to turn within the lower section and be elevated by a shortening of said cable.

9. In a hoisting-machine, a mast comprising a plurality of telescoping sections, means for adjusting said sections, and means for locking the sections in adjusted position, said means comprising a tapered member fixed to the upper end of each inclosing section, a movable gripping member suspended above said fixed member and having a tapered surface to coact with the tapered surface of the fixed members whereby to cause the inclosed section to be gripped on a slight lowering movement thereof, and trip means associated with said movable gripping member.

10. In a hoisting-machine, a sectional telescoping mast, means for adjusting the sections thereof, and means for locking the sections in adjusted position, said means comprising a collar fixed to the upper end of the inclosing section and having its inner surface partially tapered, a movable member suspended above said collar having a serrated mast-engaging surface and a tapered surface for coacting with

the tapered surface of said collar whereby to cause it to grip the inclosed section as it is lowered, and a yoke from which said movable member is suspended having means whereby a release of said member with the inclosed section may be effected.

11. In a portable hoisting-machine, a vehicle-frame, a mast having pivotal connection with said frame whereby it may be placed in reclining or erect position, and means to which said mast is pivoted adapted to be moved to cause a movement of the mast longitudinally of the vehicle-frame.

12. In a machine of the class described, a vehicle-frame, members mounted to have a movement longitudinally of said frame, means for causing such movement, and a mast having pivotal connection with said members whereby it may have an adjustment longitudinally of the vehicle-frame.

13. In a hoisting-machine, a mast comprising longitudinally-adjustable telescoping sections, one section being permitted to turn within the other, means for effecting a longitudinal adjustment of the mast-sections, and means for automatically locking the sections against relative turning and longitudinal movements when a lowering strain is applied to the top section.

14. In a machine of the class described, a vehicle, racks mounted at one end and movable longitudinally of the vehicle-frame, means for imparting movement to said racks, and a mast pivoted to the outer ends of said racks whereby it is permitted to have a movement longitudinally of the vehicle-frame or be placed in reclining or erect position.

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

WILLIAM M. BROWN.

Witnesses:

LOWELL SCHREIBER,

C. W. OWEN.