

Jan. 15, 1952

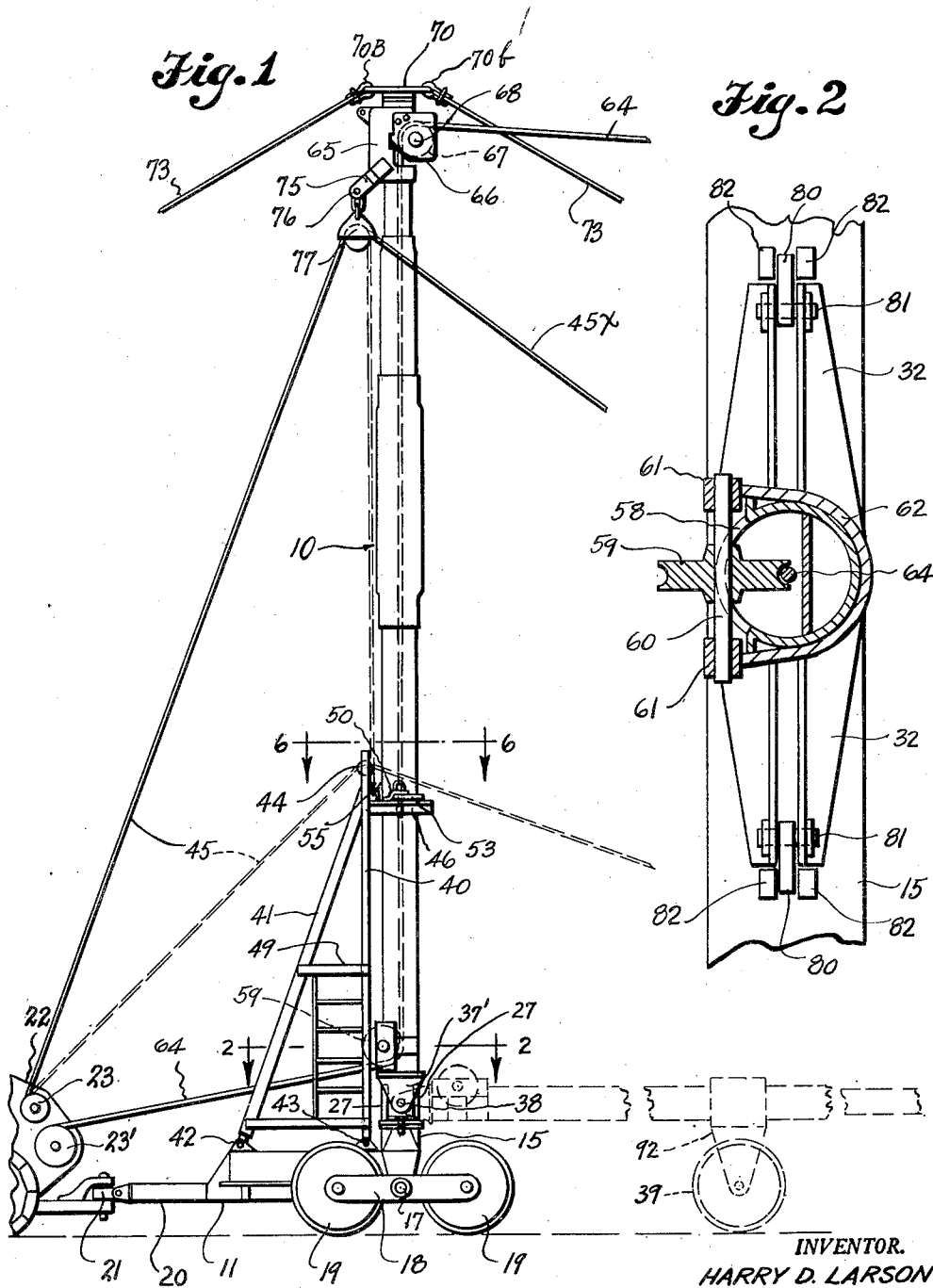
H. D. LARSON

2,582,548

PORTABLE LOGGING TOWER

Filed April 1, 1946

3 Sheets-Sheet 1



INVENTOR.
HARRY D. LARSON

BY
Cook & Robinson
ATTORNEYS

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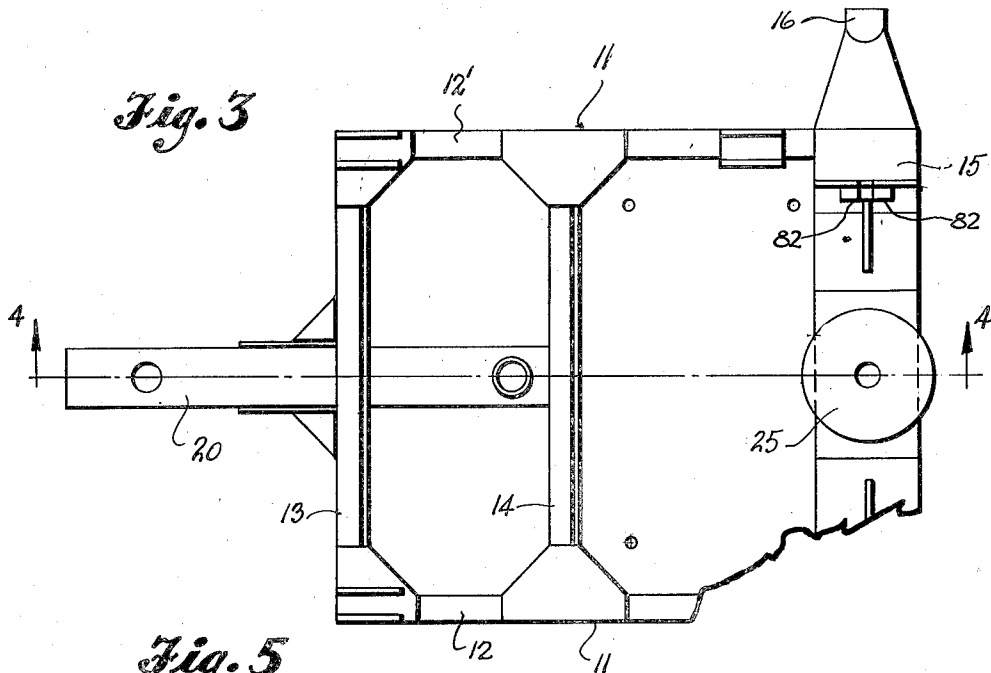
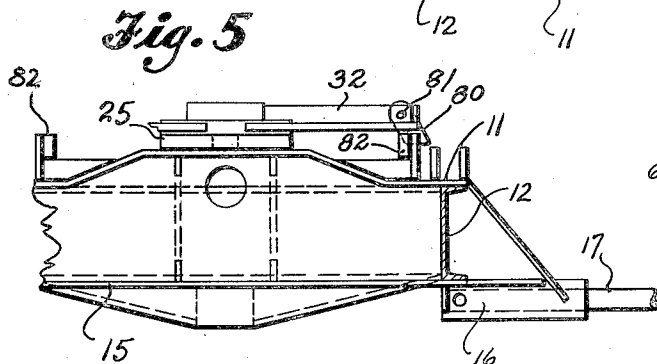
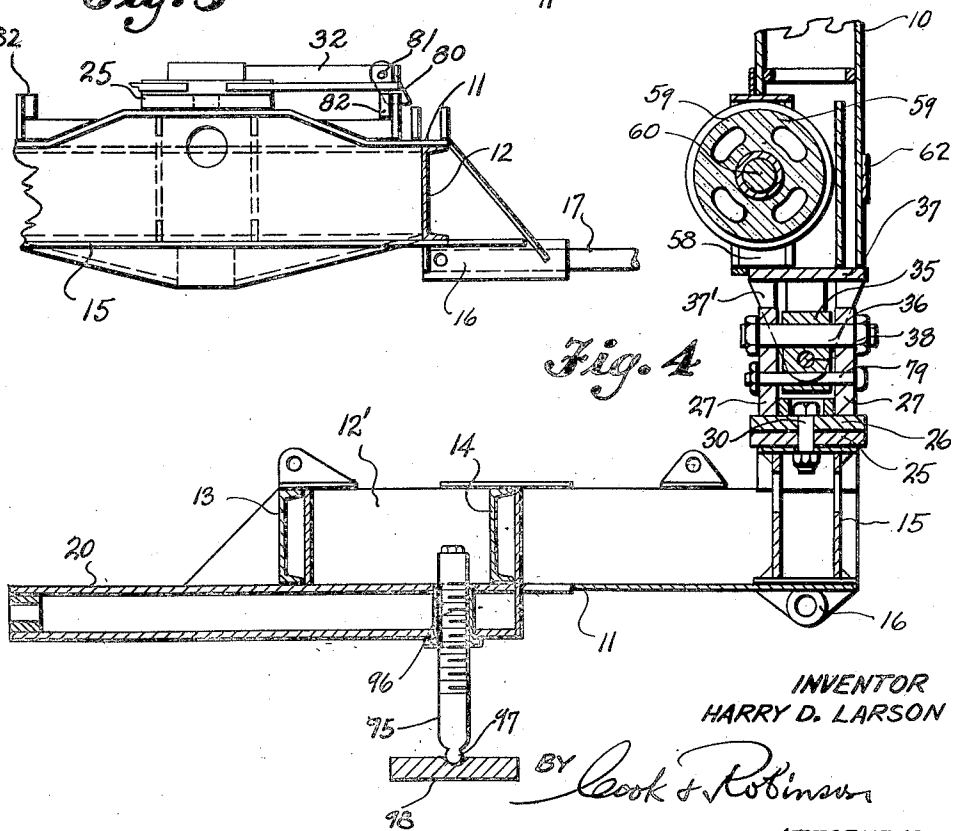
H. D. LARSON

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3 Sheets-Sheet 2



INVENTOR
HARRY D. LARSON

BY *Cook & Robinson*
ATTORNEYS

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H. D. LARSON

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3 Sheets-Sheet 3

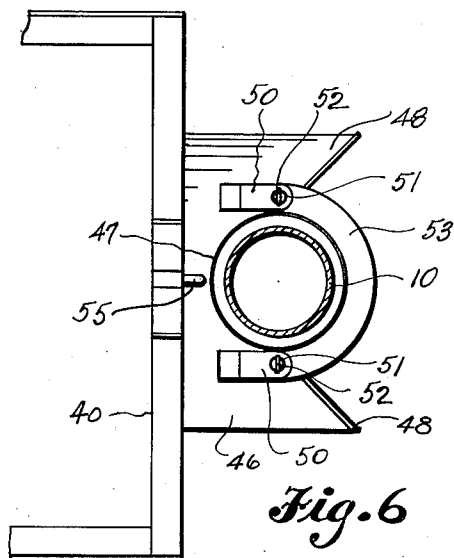
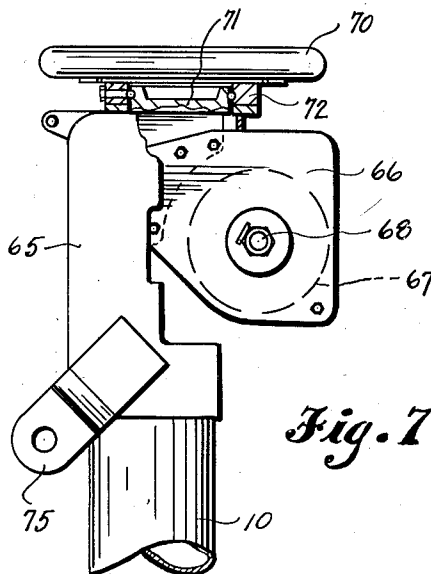
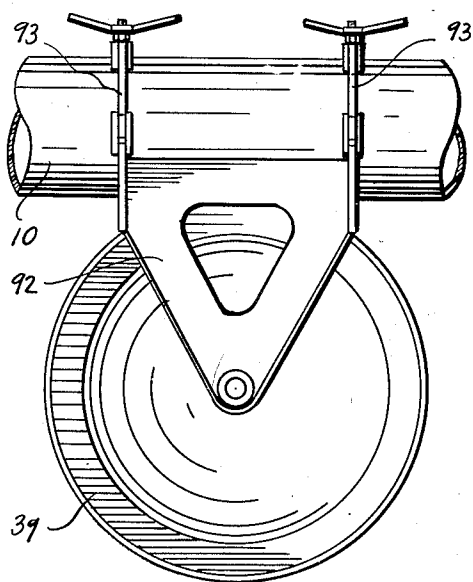
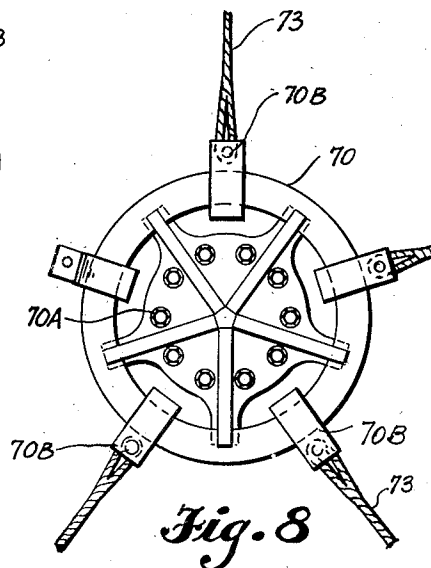


Fig. 9

INVENTOR.
HARRY D. LARSON

BY

Cook & Robinson

ATTORNEYS

UNITED STATES PATENT OFFICE

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PORTABLE LOGGING TOWER

Harry D. Larson, Seattle, Wash., assignor to
Isaacson Iron Works, Seattle, Wash.

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2 Claims. (Cl. 189—11)

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This invention relates to logging equipment and it has reference more particularly to those devices known in the logging industry as portable "logging towers," and which are used in modern methods of cable logging for those purposes for which "spar trees" have usually been used.

It is the principal object of this invention to provide a logging tower of the above stated kind that is mounted upon a wheeled carrier which serves when the mast or tower is erected, as a supporting base, and serves, when the mast is lowered, as a conveyance by which it may be moved from place to place for use.

Furthermore, it has been an object to equip this carrier with devices for the quick and easy erection of the tower for use, and for lowering it to a trailing position for convenient and safe movement from one location to another.

It is also an object of this invention to provide novel means associated with the carrying vehicle for the rigid support of the tower when adjusted from a lowered to an erected position. Also means coacting therewith for the hinged action of the tower or mast, and serving as a fifth-wheel carrier for the tower when the latter is being trailed along a roadway.

Another object of the invention is to provide a portable tower of the character above mentioned that is equipped with the necessary rigging for handling the various cables required in the various logging operations for which it is adapted.

Other objects relate to the various guying and locking devices used in connection with the tower to insure proper support.

Still further objects of the invention reside in the details of construction of its various parts and mode of operation of the device for its intended uses, as will hereinafter be described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a side view of a logging tower embodied by the present invention; the tower being shown in an erected position and, in dotted lines, is shown in its lowered position for travel.

Fig. 2 is an enlarged cross section taken on line 2—2 in Fig. 1.

Fig. 3 is a plan view of the chassis of the carrier, a part being broken away.

Fig. 4 is a central, longitudinal section of the carrier frame or chassis and a portion of the base of the tower taken on line 4—4 in Fig. 3.

Fig. 5 is a partial rear end elevation of the chassis.

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Fig. 6 is an enlarged, horizontal section taken on line 6—6 in Fig. 1.

Fig. 7 is a side view of the tower or mast head structure, shown partly in section for better understanding.

Fig. 8 is a top view of the guy line anchor wheel that is applied to the mast head fitting.

Fig. 9 is a side view of the trailer wheel as applied to the tower for the support of its rearward end portion when lowered to trailing position.

Referring more in detail to the drawings—

In the various methods of logging by use of cables, for example, in what is known as "sky line" logging, "high lead" logging and various other methods contemplating the handling of logs through the mediacy of cables and power driven winding drums, it is customary to select a spar tree for the support or securement of the main load sustaining cable. This cable might be called a sky line, slack line, main line or be known by any other name, as will be readily understood by those familiar with modern logging as practised in the forests of the Pacific Northwest and Canada.

It frequently happens, however, that a suitable spar tree is not available in the most desirable location for the work to be done and therefore the set-up for logging a certain area has to be located at a place where such tree is to be found. In some instances, spar trees have been moved while in erected position, but such is not a practical solution for this particular problem.

The present invention takes into consideration the many requirements of a spar tree, not only for the support of one end of the "main line" but also the devices required for carrying the rigging for the haul back line and for the attachment of guy lines.

The present invention provides a portable logging tower, or mast, which serves all the various purposes of a spar tree; that may be easily and conveniently drawn by tractor from place to place; that may be easily and readily erected and secured at the most practical locations for logging designated areas, and will serve the intended purposes of a spar tree with fewer and easier rigging requirements.

In its present preferred form of construction, the tower or mast, which is designated in its entirety in Fig. 1 by reference numeral 10, is supported upon a horizontally disposed frame or chassis 11 of rectangular form, as best shown in Figs. 1 and 3. This chassis comprises opposite side beams 12 and 12' of channel form, that are

rigidly joined across their forward end portions by beams 13 and 14 and at their rearward end portions are joined by a heavy, double web cross beam 15 of such design and strength as to adequately serve as a support for the tower which is mounted thereon, as presently explained.

Fixed to the opposite under sides of and, in alinement with the cross beam 15, below the chassis, are tubular bearings 16 shown best in Fig. 5, each of which mounts therein a stub axle 17 extended to the corresponding side of the chassis. Pivotally mounted on each of the stub axles and extended in a forward and rearward direction, is a wheel frame 18 which, at its forward and rearward ends, mounts supporting wheels 19 of suitable kind in tandem therein.

At its forward end, the frame or chassis is equipped centrally with a tongue 20 for attachment to a tractor or the like for pulling the carrier from place to place. This tongue is rigidly secured to the frame as shown in Fig. 3, and is equipped at its forward end with a suitable swivel type connecting device, as at 21, for its attachment to the draft vehicle.

It is most practical to employ a present-day type of tractor for the transportation of such a tower, and in Fig. 1, I have designated a part of such a tractor by numeral 22. Such a tractor would be equipped with power driven cable winding drums as indicated at 23 and 23', for purpose presently explained.

Mounted centrally upon and secured to the cross beam 15, as seen best in Figs. 3, 4 and 5, is a horizontal plate 25 serving as the base plate of a fifth wheel assembly, and mounted upon this plate 25 is the upper portion of the fifth-wheel assembly on which the lower end of the mast or tower 10 is hinged for raising and lowering movement. This latter portion of the fifth-wheel structure comprises a circular bottom plate 26 that rests flatly upon the plate 25. Two spaced, vertical lugs or posts 27—27 are welded or otherwise rigidly secured to the plate 26 at forward and rearward sides of its center point, as shown in Fig. 4, and a pivot bolt 30 extends vertically through the plates 25 and 26 at their centers, as noted in Fig. 4, to rotatively secure the upper portion of the fifth-wheel structure functionally in place upon the plate 25.

Fixed rigidly to the plate 26 and extended radially and equally to opposite sides thereof in alinement, as seen in Fig. 2, are horizontal arms 32—32 which are used for the purposes of steadying and for locking the mast against rotation, as presently will be explained.

Disposed between the posts, or lugs 27—27 that are fixed on plate 26, is a block 35, seen best in Fig. 4, that is suspended for oscillatory movement on a supporting bolt or pin 36 that extends between and is mounted at its ends in the lugs 27 and 27. The tower 10 is of tubular form, and its lower end portion is square-cut and is disposed flatly upon and is rigidly secured, by welding or otherwise, to a flat plate 37 that forms the top of a mounting yoke comprising spaced leg portions 37' and 37' that extend down from the plate 37 to opposite sides of the block 35 and at their lower ends are pivoted thereto by a cross pin 38; the pin 38 being at a right angle to the direction of pivot pin 36. When in its erected position, the tower may pivot on pin 36 in opposite directions laterally of the supporting chassis, and may pivot in a forward or rearward direction on the pin 38. When moved between erected and lowered posi-

tions, the tower or mast pivots, or hinges, at its lower end on the pin 38. Also, it will be explained that when the tower is in lowered, trailing position, it may be supported by a wheel 39 as applied thereto in Figs. 1 and 9, and in travel, the upper structure of the fifth-wheel assembly will turn as required on plate 25 by reason of the pivot bolt connection 30 between plates 25 and 26.

Erected upon the chassis just forward of the position of the mast, is a derrick best shown in Fig. 1, comprising a vertical frame structure 40 along which the tower or mast is closely disposed when in its erected position, and a diagonal bracing frame structure 41; the lower ends of the parts 40 and 41 being bolted to the chassis at opposite sides as shown at 42 and 43 in Fig. 1. At its upper end, the derrick carries a sheave wheel 44 over which a cable 45 from the drum 23 on the tractor may be extended, as explained later, and just below this sheave, a plate 46 is fixed to the derrick in horizontal position to extend in a rearward direction. The plate 46, as noted best in Fig. 6, is formed with a rearwardly opening seat 47 for receiving the forward side of the tubular tower thereagainst, and lateral diverging guide wings 48—48 are formed as parts of the plate for guiding the tower into the seat when it is lifted to an upright position.

At opposite sides of the seat, the plate wings are equipped with bracket 50—50, with holes 51 therein vertically alined with holes in the wings to receive pins 52 therethrough, and a strap 53 is provided to extend about the forward side of the mast when so seated, and to receive the pins 52 through its ends, thus to hold the mast in an erected position. This is especially useful prior to applying the guy lines to the erected mast.

Also, it is shown in Fig. 1 that a cable anchor loop 55 is secured to the upper end of the derrick between the sheave 44 and the plate 46, and this is used for securement of one end of a cable which is used, as presently explained, for aiding in the erecting and lowering of the mast.

The cable 45, as here applied, is intended to serve not only for assisting in raising and lowering the tower between trailing and erected positions, but also is used as a haul-back line in the logging operations. Also, as noted in Fig. 1, a platform 49 and ladder leading thereto, is provided in the derrick to give easier access to the band 53 and pins 52.

It will be understood by reference to Fig. 1, that the mast 10 is made up of a plurality of joined tubular sections of proper size and strength for the intended use, and to make the mast a required height. However, the mast might be tubular or of open or other form of construction without departing from the spirit of the invention.

As seen in Figs. 2 and 4, an opening 58 is provided in the front side of the tubular mast near its lower end, and a sheave wheel 59 is mounted in this mast opening to revolve on a horizontal supporting pin or shaft 60; this pin being carried at its ends in bearings 61—61 which are formed as a part of a reinforcing band 62 that is applied to the mast at this location, as best shown in Fig. 2. Thus a cable, such as designated at 64 in Fig. 1, may be extended forwardly from the winding drum 23' on the tractor, passed about the under side of the sheave wheel 59 and then passed directly upwardly, inside the mast to its upper end, and there lead rearwardly

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to the extent desired to serve as the main line for the logging operations.

At its upper end, the mast 10 has a head fitting 65 fixed thereon, as best shown in Fig. 7. This has opposite side wall portions between which a sheave block 66 is secured. The block mounts a sheave wheel 67 therein to revolve on a supporting pin 68. This sheave is so disposed as to receive the cable 64 thereover for paying it out in a rearward direction from the sheave wheel, as understood by reference to Fig. 1.

As seen in Fig. 7, the sheave block 66 is bolted rigidly to a mounting hub 71 that is secured for axial rotation in the upper end of the fitting 65. This manner of mounting the block permits it to swing through a horizontal arc of approximately 180° from side to side of the mast, and the fitting 65 has its opposite side walls cut away as required for this swinging action of the block.

Disposed centrally upon the upper end of the fitting 65 is a horizontally mounted wheel 70 that is secured rigidly thereto by bolts 70a passed through its body portion. Slidably mounted on the wheel rim are loops 70b to which guy or anchor lines 73 are attached for the support of the mast in its erected position. The loops will slide along the rim of the wheel to accommodate them to the extended direction of the guy lines.

Also fixed to the fitting 65, in a forwardly and downwardly extended direction, are spaced bracket arms 75, mounting a cross pin 76 between them for the support thereon of a pulley block 77 which may be used in erecting the mast from its lowered position and also in lowering the mast. This pulley block is used for the haul back line 45 during logging operations.

Assuming that the mast has been transported to a selected location for its erection, and that the chassis of the carrier vehicle has been brought to a substantially level position alined with the mast, the mast or tower may then be erected as follows: First, the cable 45 which normally is drawn out from drum 23, over the sheave wheel 44 at the upper end of the derrick and extended about block sheave 77 and anchored at its end to the loop 55, is now wound in on the drum 23. This will cause the mast to be lifted and to swing hingedly about the pivot or hinge pin 38 to its upright position and to thereby be brought against the seat 47 of the plate 46. After this, the strap 53 is applied about the mast and secured to the plate.

Also, to give additional support for the block 35, a pin 79, shown in Fig. 4, may now be extended through alined holes in the block and leg portions 37' of the mast mounting yoke.

After the mast has thus been erected, the guy lines 73 attached to wheel 70, are extended to suitable anchorage and properly secured.

The main line or cable 64, which normally remains extended over the mast sheaves 59 and 67, is then drawn out to the point of anchorage by use of the cable 45 which, after having its end detached from loop 55, may be used as a hand-back line, and would be extended from the erected mast as indicated at 45x in Fig. 1.

To insure that the mast 10 will not turn on the support 25 when in its erected position, I have equipped the outer ends of the arms 32—32 that are fixed to the upper fifth-wheel structure previously described, with pivoted latch devices 80. These are adapted to swing down on their pivots 81 into holding contact between paired lugs 82—82 formed in the top side of cross beam 15. This holds the fifth-wheel rigid.

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When the fifth-wheel action is desired, for example, during the travel of the device along a road with the mast lowered, the latches 80 are swung up and out of holding contact with the cross beam 15.

For the support of the rear end of the mast when in trailing position, the caster wheel 39 or other suitable type of wheel, as shown in Figs. 1 and 9, may be applied thereto. Such a wheel would preferably be equipped with mounting means permitting it to be clamped about the mast and to be readily removed.

In Fig. 9, I have shown the wheel as being mounted by a saddle portion 92 in which the mast may be rested and a pair of clamp bands 93 that extend over the top side of the mast and are anchored to the saddle portion.

Normally, the forward end of the chassis would be supported through the mediacy of the draft tongue, but in the event that it is to be detached from the tractor for any reason, then a leg or jack of slidable kind would be used as a support for this end. In Fig. 4, I have indicated such a jack, and it comprises a shaft 95 applied through a vertical sleeve fixed in the base of the tongue portion 20 of the chassis and secured and adjusted by a threaded connection at 96. The shaft has a lower ball end 97 fitted in a socket in a plate 98 applied against the ground.

Assuming the mast, or tower, to be so constructed, it is apparent that, when lowered, it can be moved from place to place in an expeditious manner. It may be easily raised and lowered by devices carried on the same tractor used to move it and when in erected position, the mast may be safely guyed. After this, the haul back line is extended to a distant point, passed over a block and returned to the mast and there attached to the main line. Then, by winding the haul back line in on drum 23, the main line is pulled out as required and secured in the usual way.

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

1. A mobile road vehicle comprising a cross-beam with horizontal plate fixed thereon and serving as a tower base, a fifth wheel assembly disposed on the cross-beam and comprising a bottom plate engaged flatly upon the said horizontal plate, a vertical pivot bolt extended through the said plates for the turning of the fifth wheel assembly, upright flanges on said bottom plate equally spaced forwardly and rearwardly of the pivot bolt, a second pivot bolt extended horizontally between said flanges, a block pivotally supported by said bolt between said flanges, a tower mounting yoke comprising a top plate and laterally spaced leg portions extended downwardly therefrom to opposite sides of said block, a third pivot bolt, extended horizontally through said legs and said block, at a right angle to the direction of the block mounting pivot bolt, a tower rigidly mounted on the top plate of the yoke; said tower being adapted to be swung on the last mentioned pivot bolt to a trailing position back of the said road vehicle, a derrick rigidly mounted on the road vehicle immediately forward of the cross-beam, and a tower holding means at the upper end of the derrick for embracing the tower when raised to an upright position.

2. A device as in claim 1 including also, arms extend laterally in opposite directions from the bottom plate of the fifth wheel assembly along

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the cross-beam, pivoted latch at the outer ends of the arms, means on the cross-beam to be engaged by said latches to hold the fifth wheel assembly against turning when the tower is in an erected position.

HARRY D. LARSON.

REFERENCES CITED

The following references are of record in the file of this patent:

8

UNITED STATES PATENTS

Number	Name	Date
463,009	Swift -----	Nov. 10, 1891
1,558,105	McGiffert -----	Oct. 20, 1925
1,790,692	Allen -----	Feb. 3, 1931
2,128,712	Neff -----	Aug. 30, 1938
2,191,181	Rogers -----	Feb. 20, 1940
2,210,407	Henry -----	Aug. 6, 1940
2,275,195	Martin -----	Mar. 3, 1942
2,362,220	Shoemaker -----	Nov. 7, 1944