Aug. 8, 1939. L. M. YORK 2,168,837

OIL WELL RIG

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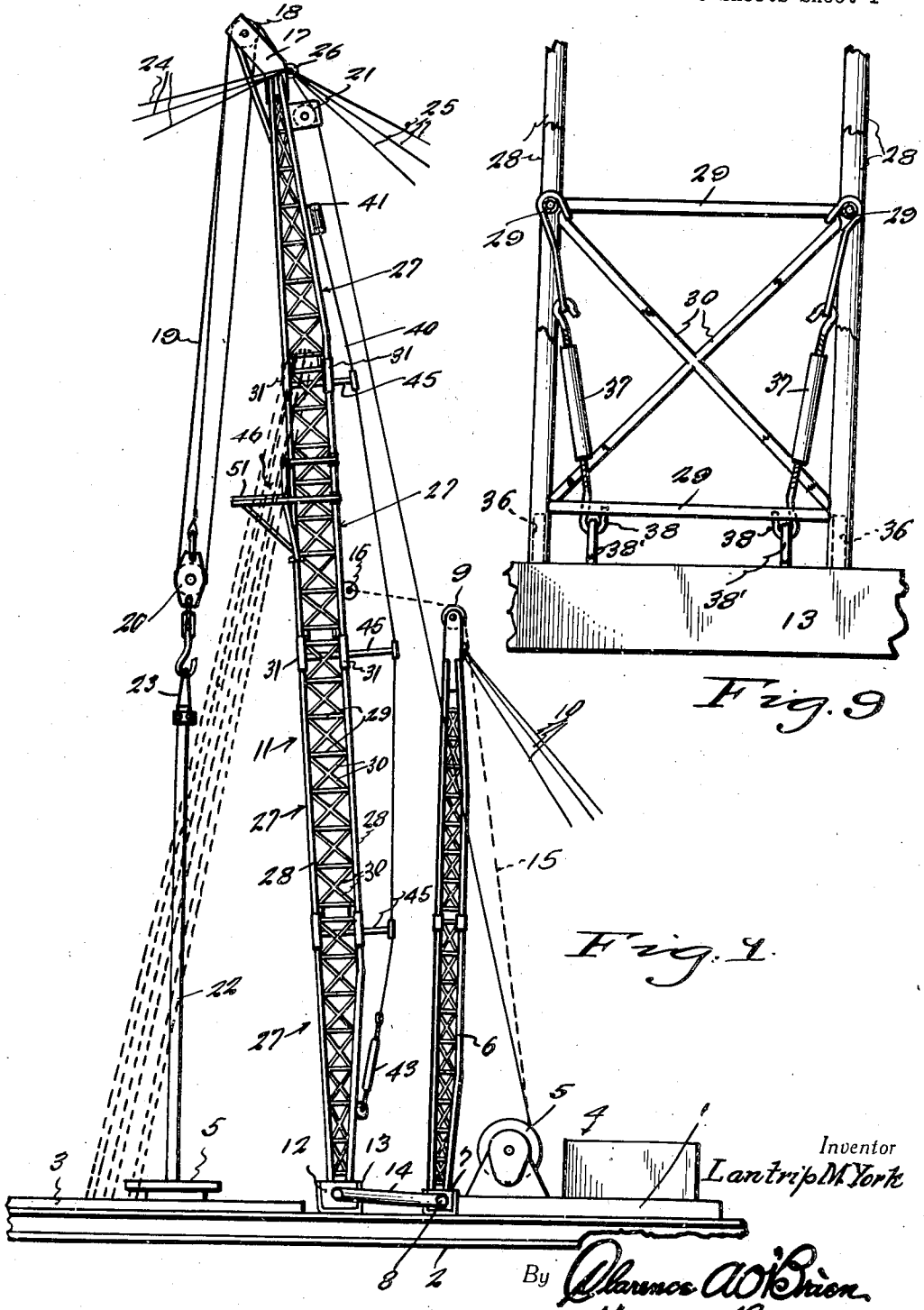


Fig. 9

Fig. 1.

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Fig. 2.

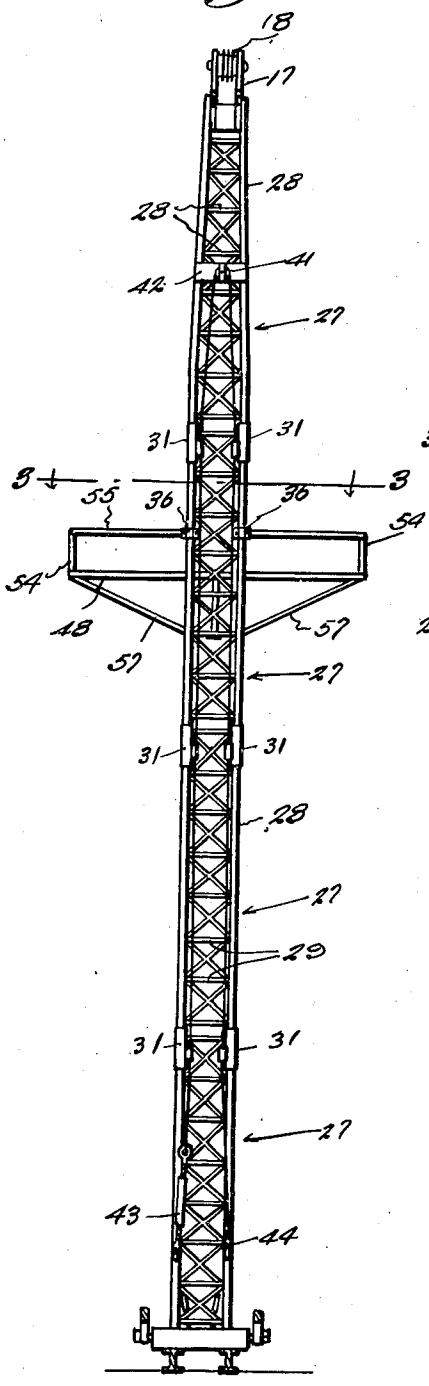


Fig. 1.

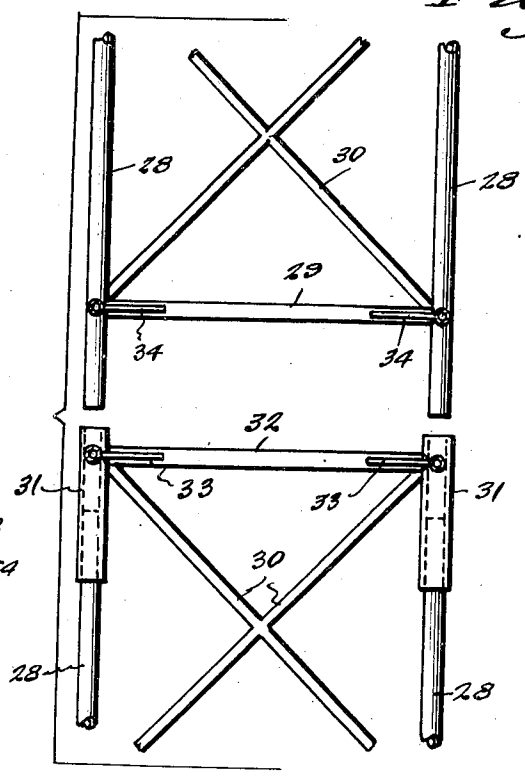
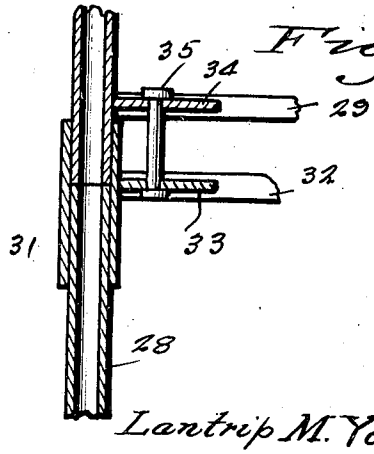


Fig. 8.



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Fig. 3.

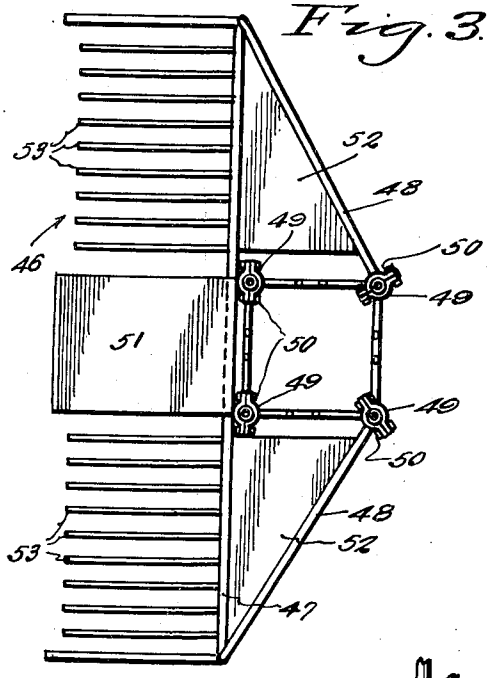
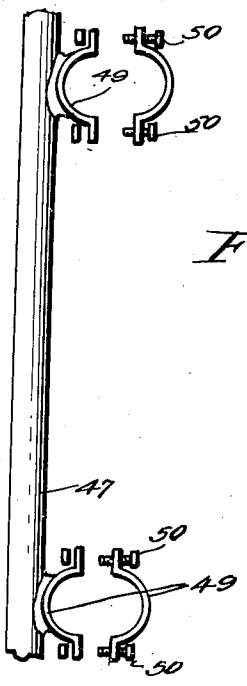


Fig. 5.



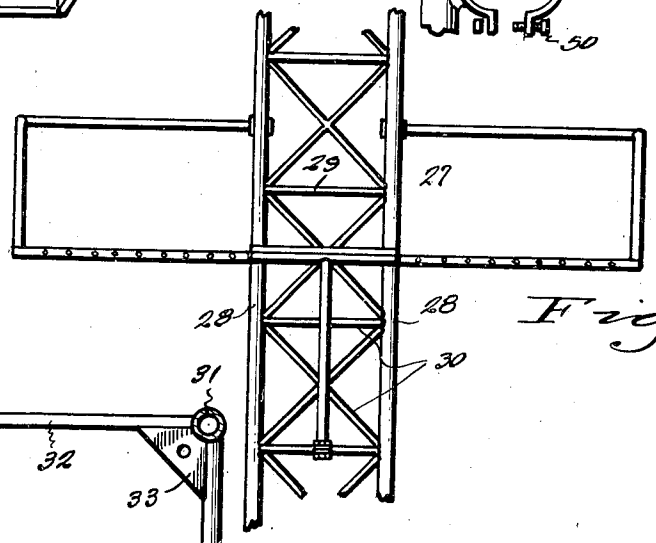


Fig. 4.

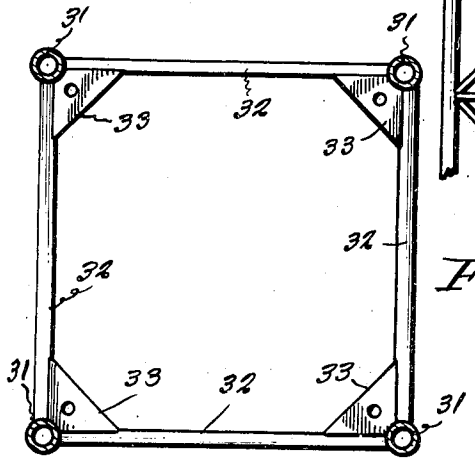


Fig. 6.

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UNITED STATES PATENT OFFICE

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OIL WELL RIG

Lantrip M. York, Lake Charles, La.

Application December 20, 1937, Serial No. 180,856

2 Claims. (Cl. 214—1)

My invention relates to improvements in oil well rigs of the portable derrick type for use particularly in pulling and stacking well tubing although, as will presently appear, it is adapted for other uses such as in handling drill stem and other pipe and rods and in servicing gas, water, and other wells.

By way of premise, oil wells, as is well known, require frequent servicing by way of pulling and detaching from each other the sections of well tubing to clear the line for proper operation in drilling. Well tubing is manufactured in very long lengths and must be pulled from the well with a direct vertical pull and stacked on end without any great inclination from the vertical otherwise the tubing is subjected to bending the disadvantages of which will be manifest. Heretofore such pulling of well tubing has been accomplished by means of rigs of the derrick type erected over the well as occasion required. This is expensive, time consuming, and attended with considerable danger to operators. Furthermore it requires a separate rig for each well.

Having the foregoing in mind, it is the principal object of my invention to provide a portable rig movable from well to well and equipped especially for pulling, with a direct vertical pull, long lengths of well tubing from the well and stacking the same on end without inclining them from the vertical to such an extent as to cause them to bend, and which, as compared with the derrick equipment, above mentioned, is more efficient, durable and economical in operation.

My invention also comprehends other objects, all of which will become readily apparent when the succeeding description is read in conjunction with the drawings accompanying and forming part of this specification, it being understood that the invention resides in the features of construction and combination of parts specifically treated in said description, illustrated in the drawings, and defined in the claims appended hereto.

In said drawings—

Figure 1 is a view in side elevation of a rig embodying my improvements,

Figure 2 is a view in rear elevation of the boom and parts appurtenant thereto,

Figure 3 is a view in transverse section taken on the line 3—3 of Figure 2, looking downwardly and drawn to an enlarged scale,

Figure 4 is a fragmentary view in front elevation of the parts shown in Figure 3,

Figure 5 is a detailed fragmentary view in top plan of means for securing the finger board to the boom,

Figure 6 is a view in top plan, parts shown in section, of one of the sections of the boom,

Figure 7 is a view in vertical section of parts of two adjoining boom sections, the sections being disassembled,

Figure 8 is a detailed view in vertical section illustrating the means for attaching two boom sections together, and

Figure 9 is a fragmentary view in front elevation of the lower end of the boom, parts broken away, and parts shown in section.

Referring to the drawings by numerals, in the illustrated embodiment thereof, the rig of my invention comprises a carriage 1 mounted in any suitable manner on rails 2 for movement along the same toward and from the well location indicated at 3. The carriage 1 supports the usual hoisting mechanism designated as a unit by the numeral 4 and including the hoisting drum assembly 5.

In front of the carriage 1 is a gin pole 6 suitably supported in a base block 7 encased by an angle iron shoe 8 resting on the rails 2 for sliding movement along the same with the carriage 1. The gin pole 6 may be of any suitable construction and has mounted at the upper end thereof the usual sheave 9. Guy wires 10 suitably attached to the upper end of the gin pole 6 and anchored in any suitable manner sustain the gin pole in vertical position against forward tilting.

In front of the gin pole 6 is a boom 11 supported at its base on the rails 2 by means of a block 12, similar to block 7, and a shoe 13, similar to shoe 8, and for rocking movement on said rails. A yoke 14 pivotally connected to the blocks 7 and 12 anchors the base of the boom 11 at a suitable distance from the gin pole 6. Vertical rocking movement of the boom 11 is imparted thereto to lift the same into upstanding position by means of the usual cable represented by dotted lines, at 15, and extending from the drum assembly 5 over the sheave 9 with one end connected to an intermediate part of boom as at 16.

As shown in Figure 1 the boom 11 is designed to be positioned close to the well 3 and rocked thereover into substantially vertical position, that is to say, into a slightly forwardly inclined position. At its upper end the boom 11 has suitably secured thereto to project forwardly therefrom a yoke 17 serving as a mounting for the usual sheave assembly 18 for the usual block and tackle including the hoisting cable 19 extending from

the drum assembly 5 and the block 20 carried in the bight of the cable 19. An idler 21 is provided on the upper end of the boom 11 on the rear thereof for guiding the cable 19 at this point. In the described position of the boom 11 and by virtue of the yoke 17 the cable 19 and block 20 are suspended from the sheave assembly 18 in substantially vertical alignment with the well tubing 22 so that by connecting said block to the said tubing the latter may be pulled from the well 3 by a pull directed thereagainst axially thereof. The block 20 is connected to the well tubing 22 by means of any suitable clamp or coupling represented at 23. Forwardly and rearwardly extending guy wires, or cables, 24 and 25 secured to the yoke 17, as at 26, and suitably anchored secure the boom 11 in the described position.

With specific reference to the boom 11, this member is formed of sections reinforced at their juncture with each other and further constructed to impart great strength and rigidity thereto without unduly increasing the weight thereof. Each section 27 comprises four longitudinal tubular members 28 connected together by intermediate tubular cross members 29 and diagonal tubular struts 30 both welded in position. With the exception of the top section 27 the others are provided at what may be termed upper ends thereof with tubular sockets 31 sleeved and welded onto the ends of the members 28 and in which the lower ends of the next higher section member 28 are telescopically fitted. Extending between the sockets 31 of each section 27 are cross bars 32 similar to bars 29. Corner brackets 33 are welded to the sockets 33 and bars 32 extending therefrom. Similar brackets 34 are welded to the lower ends of members 28 and the lowermost bars 29 of the next higher section. Bolts 35 passing through the brackets 33 and 34 of adjoining sections 27 secure the sections of the boom in assembled relation. The boom 11 is mounted on the block 12 by means of studs 36 upstanding from said block and over which the members 28 of the lowermost section 27 telescope. Turn buckles 37 having hooked ends 38 taking in eye bolts 38' in the block 12 and connected by hooked links 39 to intermediate cross members 29 of the lowermost section 27 anchor the boom 11 to said block 12.

The described boom 11 is braced against forward flexing by means of a cable strut extending from approximately midway of the upper section 27 to points adjacent the lower ends of the lowermost section 27 and along the back of said boom. The strut has the form of a steel cable 40 looped around a sheave 41 mounted on a cross bar 42 suitably secured to the back of the upper section 27, the cable ends being connected to the members 28 of the lowermost section, one by a turn buckle 43 and the other by welding as at 44. The side stretches of the cable 40 extend along the back sides of the boom 11 over stanchions 45 outstanding at intervals from the boom 11 and preferably welded to the members 28 thereof, said stanchions slidably supporting the cable 40. As will be seen, by taking up on the cable 40 through the medium of the turn buckle 43 the boom may be tensioned uniformly against flexing.

At a suitable point intermediate the ends thereof the boom 11 has mounted, on an intermediate section 27 thereof, a finger board 46. The finger board 46 comprises a base frame including a front tubular bar 47 extending across the front of said section 27 equi-distantly on each side thereof and a pair of rear horizontal bars 48 inclining from the ends of the bar 47 to the rear members 28 of said section. Suitable clamps 49, including bolts 50, secure the front bar 47 to the front members 28 of said section and the ends of the rear bars 48 to the rear members 28 of said section. The front bar 47 carries a platform 51 extending forwardly therefrom directly in front of the boom. Triangular side platforms 52 extend between the front bars 47 and rear bars 48 on opposite sides of the boom 11 respectively. Racking fingers, or rods, 53 extend forwardly from the bar 47 upon opposite sides of the platform 51, the outermost racking fingers being formed heavier than the others. The finger board 46 is equipped with a rear railing for grasping by the operator comprising end posts 54 and top rails 55 extending from the posts to the rear members 28 of said section and to which they are secured by clamps 56 similar to clamps 49. Diagonal braces 57 extend downwardly from the ends of the bar 47 to said section to which they are secured as in the case of the bars 47, 48 and rails 55. As will be seen by means of the described clamps the finger board may be adjusted to different heights on the boom 11.

Referring to the use of the invention, the finger board 46 is so designed that in the previously described position of the boom 11 the tackle 19, 20 clears the same in pulling the tubing. Thus an operator may stand on the platform 51 within convenient reach of the upper end of a tubing section as it is pulled and grasp the same. After the tubing sections are pulled they are disconnected from each other, at the usual rotary table 58 the use of which will be understood, and lifted clear of said table by the described tackle. They are then swung forwardly slightly and to one side, or the other, while suspended and lowered in upright position onto the ground. Their upper ends are then manipulated by an operative on the platform 51, or platforms 52, to incline the same into position between selected racking bars 53 and the tackle disconnected therefrom by the operative in a manner which need not be entered into herein.

As will now be seen, the described invention may be more speedily set up for operation than a stationary derrick and with much less labor and in fact will enable an operator to clean out a well that has sanded up before a permanent rig could be erected on the ground.

The foregoing will, it is believed, suffice to impart a clear understanding of the construction, use and advantages of my invention without further explanation.

Manifestly the invention, as described, is susceptible of modification without departing from the inventive concept and right is herein reserved to all such modifications falling within the scope of the subjoined claims.

What I claim is:

1. In an oil well rig for pulling well tubing, the combination with a portable hoisting mechanism movable toward and from the well, of a boom pivotally mounted at one end of said mechanism for vertical swinging movement and operative by said mechanism into upstanding position alongside the well to incline forwardly at a slight angle from the vertical, a forwardly offset yoke at the upper end of the boom overhanging the mouth of the well in said position of the boom, a block and tackle suspended from said

yoke for attachment to the well tubing in substantially vertical alignment therewith and operative by said mechanism to pull the tubing, and a finger board vertically adjustable on said boom adjacent the upper end thereof and extending forwardly therefrom between the tackle and boom, the finger board including a platform in front of the boom, a pair of platforms upon opposite sides of the boom, respectively, in the rear thereof, and racking rods extending forwardly of the platforms of said pair upon opposite sides of the front platform.

2. In a oil well rig for pulling well tubing, the combination with a portable hoisting mechanism movable toward and from the well, of a boom pivotally mounted at one end of said mechanism for vertical swinging movement and operative by said mechanism into upstanding position alongside the well to incline forwardly at a slight angle from the vertical, a block and tackle extending from the upper end of said boom for attachment to the well tubing in substantially vertical alignment therewith and operative by said mechanism to pull the tubing, and a finger board vertically adjustable on said boom adjacent the upper end thereof and extending forwardly therefrom between the tackle and the boom, the finger board including a platform in front of the boom, a pair of platforms upon opposite sides of the boom, respectively, in the rear thereof, and racking rods extending forwardly of the platforms of said pairs upon opposite sides of the front platform.

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