

Jan. 2, 1923.

1,440,598.

W. HECKART.
PORTABLE OIL WELL DERRICK.

FILED JULY 14, 1921.

3 SHEETS—SHEET 1.

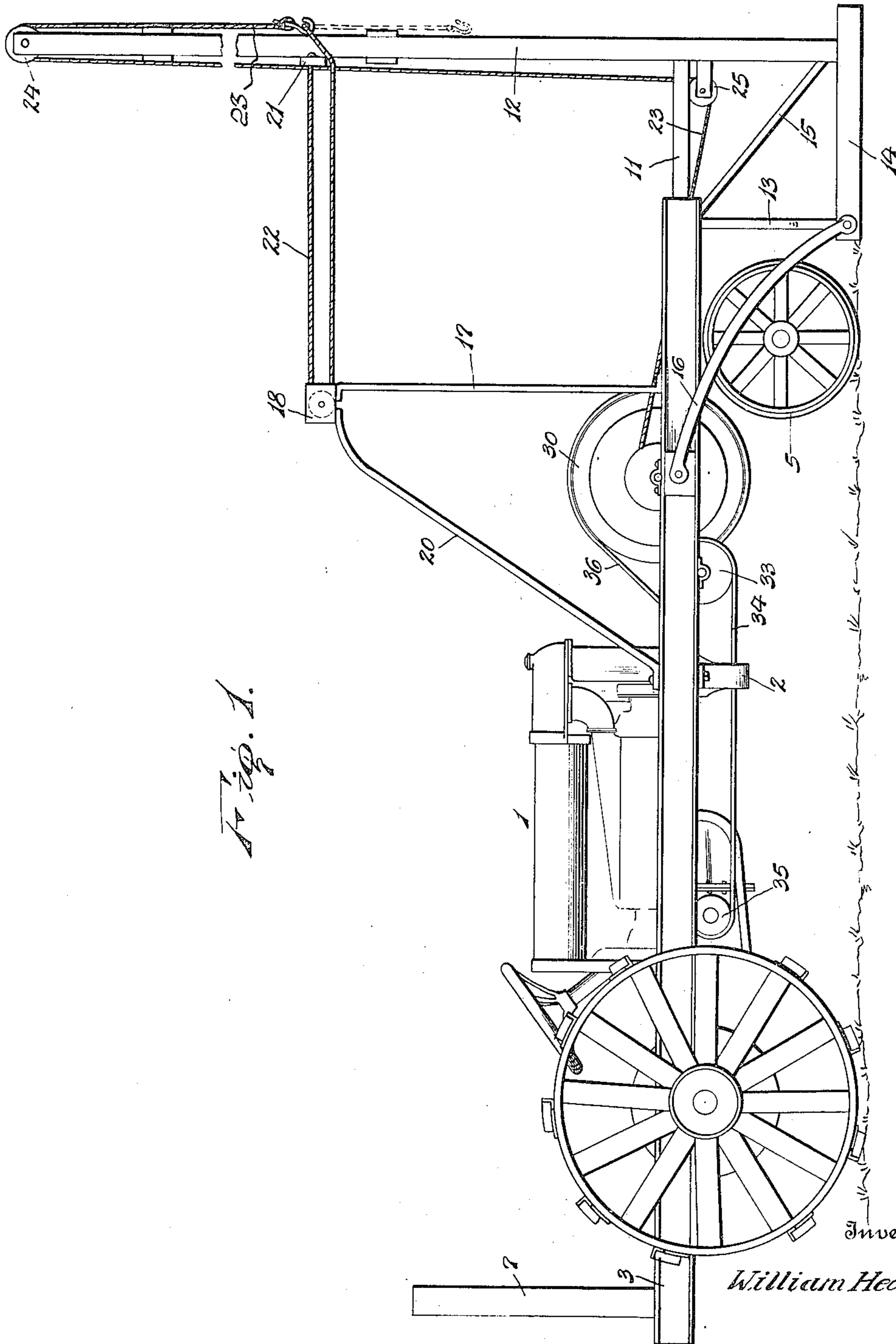


Fig. 1.

Inventor

William Heckart.

Day

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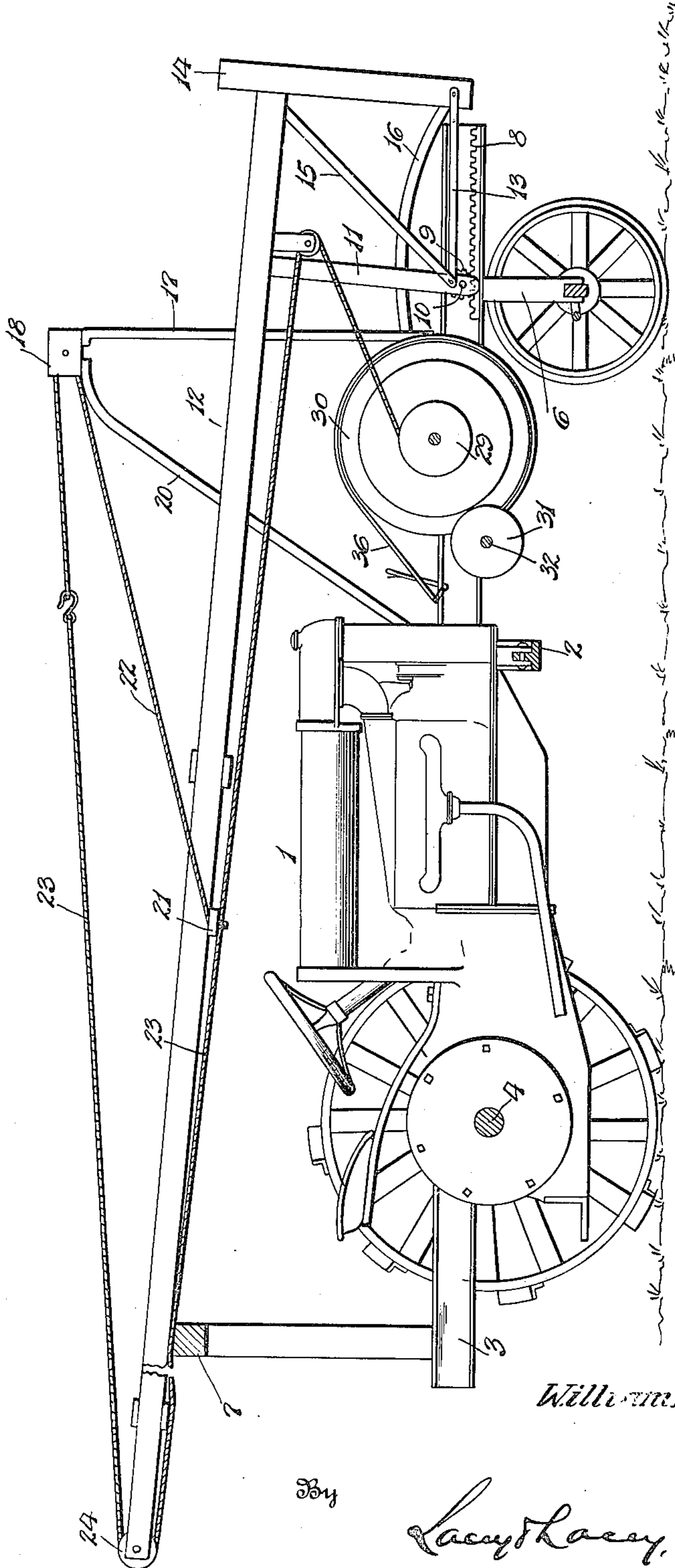
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3 SHEETS—SHEET 2.

Fig. 2.



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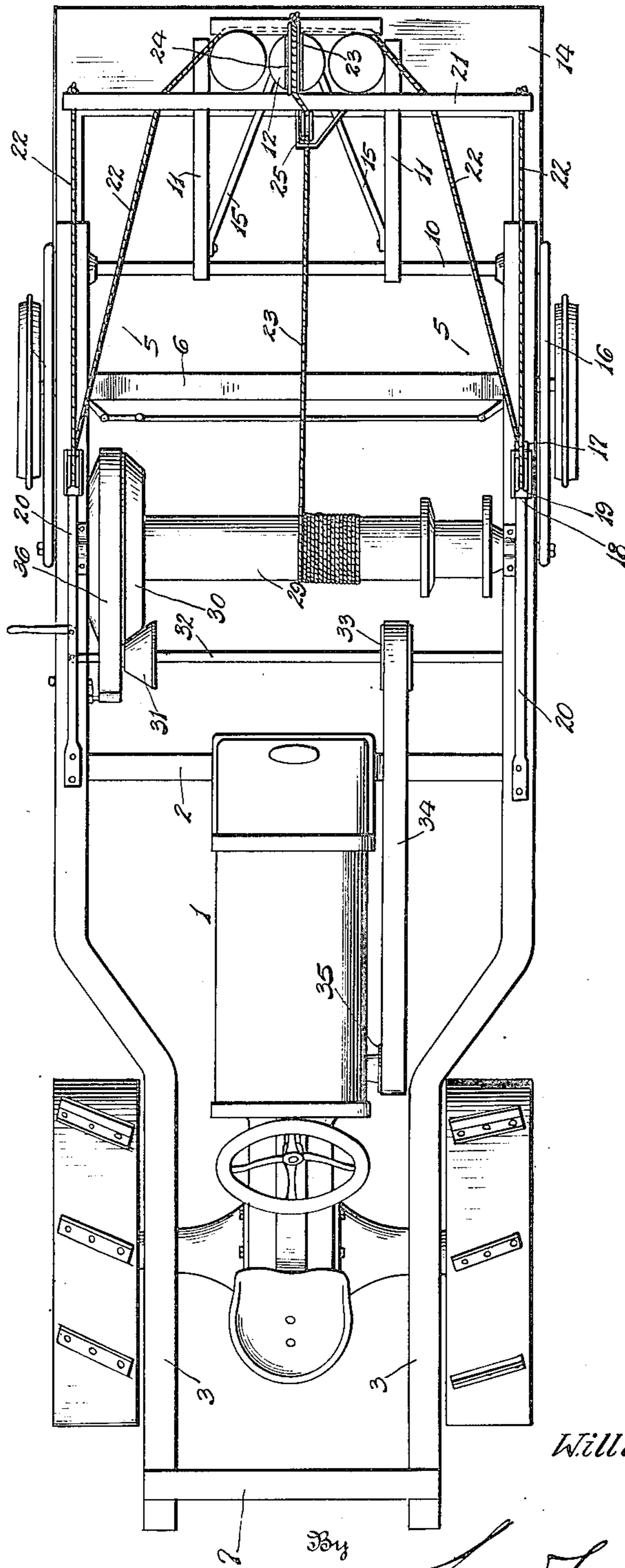
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM HECKART, OF BRADNER, OHIO.

PORTABLE OIL-WELL DERRICK.

Application filed July 14, 1921. Serial No. 484,696.

To all whom it may concern:

Be it known that I, WILLIAM HECKART, a citizen of the United States, residing at Bradner, in the county of Wood and State of Ohio, have invented certain new and useful Improvements in Portable Oil-Well Derricks, of which the following is a specification.

This invention has for its object the provision of means whereby well-pulling machinery may be readily transported from place to place and set up at a point of use. The invention seeks to provide novel means whereby the pulling machinery may be mounted upon a tractor and conveniently swung downwardly to extend over the tractor frame and be supported by the same and also easily restored to a vertical position at a point where a well is to be pulled. The invention is illustrated in the accompanying drawings and will be hereinafter fully set forth.

In the drawings—

Figure 1 is a side elevation of an apparatus embodying my improvements;

Fig. 2 is a view showing the tractor in side elevation and showing the mechanism of the invention partly in side elevation and partly in longitudinal section, Fig. 1 showing the pulling machinery set up for use and Fig. 2 showing the same arranged for transportation;

Fig. 3 is a plan view of the apparatus with the pulling machinery in operative position. The tractor 1 may be of any desired type and is illustrated in a conventional manner only. In carrying out my invention, I remove the steering wheels of the tractor and substitute for the steering wheel supports a truss 2 which is connected centrally with the front end of the tractor frame and has its ends secured rigidly to the side bars 3 of my improved apparatus. These side bars 3 are preferably I-beams secured intermediate their ends to the ends of the truss 2 and supported near their rear ends by the driving axle 4 of the tractor. The steering wheels 5 are moved to a point near the front ends of the beams 3 and are carried by said beams through the intervention of a suitable yoke 6. Upon the side beams 3 at the rear ends thereof, I erect a transverse supporting frame 7 which may conveniently be a pair of standards rising from the side beams and a cross bar connecting the upper ends of said standards or may be of any other suitable

form. At the front ends of the side bars 3, upon the inner lower webs or flanges thereof, I form or secure racks 8 upon which are arranged to run pinions 9 carried by a transverse shaft 10 from which supporting arms 11 extend to the derrick 12, and similar arms 13 extend to the platform 14 which, when the pulling machine is in use, sets upon the ground in advance of the tractor and furnishes a firm base for the derrick and the pulling machinery. Braces 15 also extend from the shaft 10 so as to insure a rigid structure when the apparatus is in use in pulling a well. To further aid in supporting the derrick, I provide the links 16 which are pivoted at their front ends to the platform 14 at the rear corners thereof and at their rear ends to the outer sides of the side bars 3, as shown clearly in Fig. 1. When the pulling machinery is set up for use, these links 16 extend downwardly and forwardly and, therefore, aid in holding the platform to the ground and when the apparatus is swung over the tractor, as shown in Fig. 2, the said links will have their ends in the horizontal plane of the side bars and their intermediate portions disposed somewhat above the side bars. Standards 17 are erected upon the side bars 3 in advance of the tractor and blocks 18 carrying pulleys 19 are secured to the upper ends of said standards, braces 20 being disposed in rear of the standards and secured to the said blocks at their upper ends and to the side beams or bars 3 at their lower ends, as clearly shown.

To the derrick at such point of the same as will be about in the horizontal plane of the pulleys 19, when the derrick is upright, I secure a cross bar 21 which projects beyond the sides of the derrick and to the ends of this cross bar, I secure the ends of cables 22, the said cables extending from the cross bar 21 to and around the pulleys 19 and then forwardly under said cross bar and united in front of the derrick to be engaged by a hook on the cable 23 which passes to and over a pulley 24 at the upper end of the derrick and then down in rear of the derrick to a guide pulley 25 mounted thereon, near the lower end thereof, passing under said pulley and then rearwardly to be wound upon a drum 29 supported by and between the side bars.

The drum 29 actuates the pulling machinery and is equipped at one end with a friction pulley 30 in operative engagement

with a friction pulley 31 on a transverse shaft 32 which is journaled in suitable bearings upon the side beams 3 in rear of the drum. Upon the shaft 32 is secured
 5 a belt pulley 33 and a belt 34 is trained around the said pulley and the belt pulley 35 on the side of the tractor. The usual brake band 36 is provided to control the rotation of the brake wheel and pulley 30 and
 10 the drum 29 which is driven thereby.

Assuming the derrick to be set up as shown in Fig. 1, and that it is desired to lower the same to the position shown in Fig. 2 so that it may be carried to another
 15 point, the friction gearing 30, 31 is operated to wind the cable 23 upon the drum 29, the hook on said cable being first engaged with the cables 22 in front of the derrick. This action will cause the cable to exert
 20 an upward pull upon the cables 22 which will be transmitted through the said cables around the pulleys 19 to the cross bar 21, the result being that the derrick will be caused to swing rearwardly and downwardly
 25 over the tractor. This movement is initially a pivotal movement about the shaft 10 and is aided by reason of the fact that the pulley 25 is below the drum 29 and the shortening of the cable 23, therefore, exerts an up-
 30 ward pull upon the said pulley 25 which pull is transmitted to the derrick and the platform 14 and the connected parts. As the winding of the cable 23 proceeds, the pinions 9 will be caused to travel rearwardly
 35 over the racks 8 and, when the winding of the cable has brought the derrick to a dead center, it will be balanced and further winding of the cable is then prevented because the cross bar 21 is close to the pulley 19 and
 40 the cable is taut throughout its length and is not capable of acting upon a movable part. The cable is then permitted to unwind while a slight pressure is exerted upon the derrick to carry it past the dead center,
 45 whereupon the weight of the derrick will carry it to the position shown in Fig. 2 in which it is supported by the rear frame 7 and by the supporting arms 11 through the shaft 10, the pinions 9 and racks 8, as will
 50 be readily understood. The descent of the derrick may be controlled by retarding the unwinding of the cable in an obvious manner through the manipulation of the brake. The pulley 31, of course, is so mounted that
 55 when it may be readily moved out of engagement with the pulley 30 when said pulley is to reverse its motion. When it is desired to again set up the derrick for use, the drum 29 is rotated so as to effect winding of the
 60 cable and it will be readily seen, upon reference to Fig. 2, that this winding of the cable exerts a pull upon the cross bar 21 which will draw it toward the blocks 18, thereby compelling the derrick to swing up-
 65 wardly and forwardly until it reaches a

point where the bar 21 is about over the blocks 18 and the pulleys 19 in the same. The derrick will then again be upon a dead center and further winding of the cable will be without result. If a slight pressure be
 70 then exerted upon the derrick, it will be swung to the vertical position, the pinions 9 traveling forwardly upon the racks 8 and the rapidity of movement of the derrick being controlled by retarding the unwind-
 75 ing of the cable 23. After the derrick is thus brought into the operative position, the cable 23 is released from the cables 22, as indicated by dotted lines in Fig. 1, and connected with the well tubing in the usual
 80 manner. When the hook on the cable 23 is disengaged from the cables 22, the latter will be prevented from dropping to the ground by a cross bar or brace on the derrick.

It will be readily noted from the fore-
 85 going description, taken in connection with the accompanying drawings, that I have provided a very compact, simple and efficient means whereby an oil well pulling machine may be readily set up for use or
 90 placed in a horizontal position for transportation. The pulling machinery is operated in the usual manner when set up at a point where a well is to be pulled and
 95 power for that purpose is derived from the tractor through the described friction pulleys.

Having thus described the invention, what is claimed as new is:

1. The combination with a tractor, of side
 100 bars secured to and projecting forwardly beyond the tractor, a shaft disposed between the forwardly projecting ends of the said side bars, rolling supports mounted on said shaft and engaging the side bars, a derrick
 105 including a base, supporting arms extending from the derrick to the said shaft, braces pivoted at their rear ends to the side bars in rear of the said shaft and at their front ends to the rear end of the base, a well-pulling
 110 mechanism carried by the derrick, and means supported by the side bars and operated by power of the tractor for swinging the derrick from a vertical position to a horizontal position longitudinally of the tractor and
 115 vice versa.

2. The combination with a tractor, of a supporting frame carried by the tractor at the sides thereof and projecting forwardly therefrom, a well-pulling mechanism, means
 120 connecting the well-pulling mechanism with the front end of the frame for rolling pivotal movement, a support on the rear of the frame, and means carried by the frame and connected with the well-pulling mechanism
 125 for shifting the well-pulling mechanism from a vertical position in advance of the frame to a position above and longitudinal of the frame with its upper portion resting on the support at the rear end of the frame.
 130

3. The combination with a tractor, of a frame mounted on the sides of the tractor, racks on the said frame at the front end thereof, a well-pulling mechanism, supporting arms extending from said mechanism, pinions carried by said arms and meshing with said racks, and means carried by the supporting frame and connected with the well-pulling mechanism whereby to effect pivotal rolling movement of the well-pulling mechanism about said pinions and racks.

4. The combination with a tractor, of a supporting frame mounted on the sides of the tractor and extending forwardly beyond the same, standards erected on said frame, a drum mounted on the frame adjacent the lower ends of said standards, a well-pulling mechanism pivotally supported upon the front end of said frame, a cross bar carried by said well-pulling mechanism at a point intermediate the height thereof, pulleys at the upper ends of the said standards, a pulley at the upper end of the well-pulling mechanism, a pulley near the lower end

thereof, a cable adapted to be wound upon the drum and extending under the pulley near the lower end of the well-pulling mechanism and over the pulley at the top of said mechanism, and other cables attached to the cross bar and extending around the pulleys at the upper ends of said standards and adapted to be engaged by the first-mentioned cable in front of the cross bar.

5. The combination with a tractor, of a frame comprising side bars arranged parallel with the sides of the tractor and projecting forwardly beyond the same, a transverse truss disposed beneath the front end of the tractor and secured at its center to the tractor and at its ends to said side bars, a derrick mounted pivotally upon the side bars, and means mounted on the side bars in advance of the truss and operatively connected with the tractor to raise and lower the derrick by the power of the tractor.

In testimony whereof I affix my signature.

WILLIAM HECKART. [L. S.]