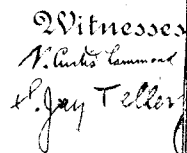


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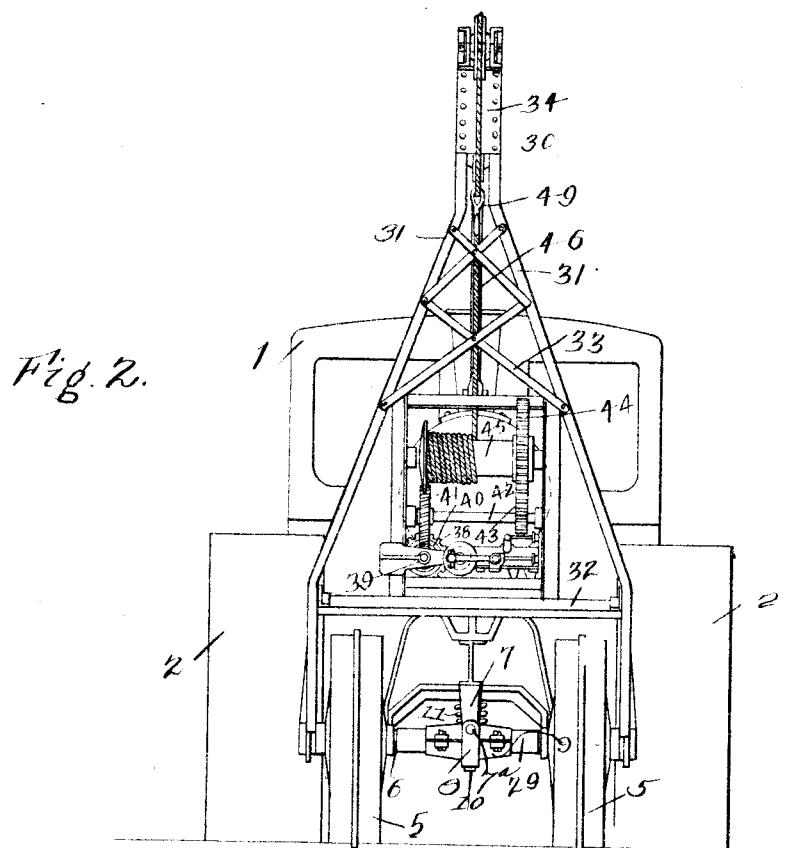
2 SHEETS--SHEET 1.



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2 SHEETS--SHEET 2.



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UNITED STATES PATENT OFFICE.

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TRACTION-ENGINE CRANE OR DERRICK.

1,066,158.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed August 27, 1910. Serial No. 579,344.

To all whom it may concern:

Be it known that I, EDGAR J. SOLOMON, a citizen of the United States, residing at Peoria, in the county of Peoria and State of Illinois, have invented certain new and useful Improvements in Traction-Engine Cranes or Derricks, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in cranes or derricks adapted to be used with traction engines.

The object of the invention is to provide a powerful and simple device of the character set forth and one which may be easily and effectively controlled and operated.

The invention has as a further object the provision of a crane or derrick which may be attached to a previously constructed traction engine without necessitating material changes in the engine.

Further objects will appear upon the reading of the following specification and claims.

In the accompanying drawings I have shown for purposes of illustration the embodiment of my invention which I at present deem preferable. However, it will be understood that many changes and modifications may be made in the construction without departing from the spirit of my invention.

In the drawings Figure 1 is a side elevation of a traction engine having attached thereto a crane embodying my invention. Fig. 2 is a front view. Fig. 3 is a fragmentary detail view showing the steering mechanism for the forward wheels.

Referring to the drawings, 1 represents the traction engine as a whole, which may be of any usual or preferred type. The engine is provided with the usual traction wheels 2, 2, which are driven from an engine 3 by means of gearing 4.

5, 5 are forward steering wheels mounted upon the ends of the axle 6. A bracket 7 is preferably secured to the frame of the engine and to this bracket there is connected by horizontal pivot 7^a a yoke 8 to which the axle is pivotally connected by means of the sleeve 9 and the vertical king-pin 10. A spring 11 is preferably provided between the top of the sleeve 9 and the bottom of the bracket 7.

It will be observed that by means of the construction which I have described the

front wheels are so connected with the main frame as to be free to swing laterally about the pivots 7^a to accommodate themselves to irregularities of the ground. The wheels may also be adjusted for the purpose of steering, as hereinafter described, about a vertical king bolt 10 which connects the bearing sleeve 9 with the yoke 8.

Any suitable mechanism may be employed for steering the forward wheels, and the mechanism which I prefer and have shown in the drawings is not claimed as my invention. The steering gear disclosed will be here briefly described. A transverse screw threaded shaft 12 is rotatably mounted in suitable bearings on the engine frame. This shaft is provided at opposite ends with the gear wheels 13 and 14. One of these gears 13 meshes with a pinion on the shaft of a small auxiliary engine 15. The other gear 14 meshes with a gear 16 which is connected by means of beveled gearing 17 with a steering shaft 18 within the sleeve 19. A hand wheel 20 is provided at the rear ends of the shaft 18 and the sleeve 19, and means are provided whereby the hand wheel may be operatively connected with either the shaft or the sleeve.

The engine 15 is provided with a controlling and reversing link 21, and by means of suitable connections, comprising a screw 22 on the sleeve 19 and a nut 23 engaging the screw, the position of the link 21 may be regulated by means of the hand wheel 20. A nut 24 engages the threaded shaft 12 and is pivotally connected with a yoke 25, which is provided with a tail piece 26 loosely engaging the depending stirrup 27. At the forward end of the yoke 25 there is pivotally connected a bar 28 which telescopically engages a yoke 29 which in turn is secured to the axle 6. It will be readily apparent that by means of the engine 15, controlled by the hand wheel 20, the shaft 12 may be rotated in either direction with consequent movement of the nut 24 toward the right or left as desired. The nut 24 carries with it the yoke 25, and by means of the connections which have been described the axle 6 and the steering wheels 5, 5 are moved to the proper angular positions. If desired the steering may be done by manual power instead of power derived from the engine 15. This is accomplished by connecting the hand wheel 20 with the shaft 18. By this

means the shaft 12 may be rotated as desired and the steering wheels moved.

30 represents the crane as a whole. The crane boom preferably comprises two connected struts 31, 31, each of which pivotally engages at its lower end one end of the axle 6. The struts may be formed of channel bars or other rolled steel sections. They preferably converge at their upper ends and may be connected as desired by tie bars, lattice work and plates, as indicated in the drawings by 32, 33 and 34. It will be noted that if properly tied together these struts will serve as a means for holding the steering wheels in longitudinal position on the axle. The upper end of the boom may be supported by means of a tie rod 35, which is pivotally connected preferably to the forward end of the boiler.

A suitable bracket or shelf 36 is secured to the boom, and upon this bracket is mounted an engine 37 which is preferably provided with two cylinders. I prefer to mount this engine with the cylinders lying transversely. A pinion on the engine crank shaft meshes with the gear 38 on the shaft 39 which carries the worm 40. The worm engages a worm wheel 41 on the shaft 42 which carries the pinion 43. This pinion meshes with the gear 44 connected with the rotatable drum 45. One end of a cable 46 is connected to the drum 45 to be wound thereon and the other end of the cable passes over sheaves 47 and 48 to a hook or other device 49. By means of the train of connections the engine 37 serves to raise and lower the hook 49 and any objects which may be attached to it. The engine 37 may be controlled by the engineer's helper positioned at the forward end of the engine, or if preferred suitable connections may be made to the cab so that this hoisting engine can be controlled by the engineer.

From the foregoing description of the structural features of my invention the mode of operation will be apparent. It is sufficient to here point out that the vertical or hoisting movement of the hook 49 is controlled by means of the engine 37. Horizontal movement of the hoisting hook and of an object suspended from it can be effected, either by causing the engine as a whole to move backward or forward or by swinging the boom laterally by means of the traction engine steering mechanism. By mounting the boom directly upon the main forward axle I avoid the necessity of providing separate mechanism for swinging the boom.

One of the important advantages of my invention is that in moving the engine with a load suspended from the crane, the load is swung to the right or to the left with the steering wheels, and on this account the engine is enabled to make shorter turns in narrow alleys or lanes than would be the

case, were the boom rigidly connected with the engine frame, or adapted to be swung only by independent mechanism.

A further advantage incident to the use of a crane, such as I have described, on an engine having a screw controlled steering mechanism is that the screw being non-overhauling automatically locks the crane against swinging because of lateral pull on the cable. If the boom is not directly over the load to be lifted no harm can result, as the boom is locked against movement and will lift the load and will afterward permit it to swing to a vertically suspended position.

What I claim is:—

1. In a dirigible vehicle, the combination with steering wheels of a crane, and connections between the steering wheels and the crane whereby both may be simultaneously adjusted, substantially as set forth.
2. In a vehicle of the class described, the combination with steering wheels, of a crane mounted directly upon the steering wheels and positively connected to them for adjustment therewith, substantially as set forth.
3. In a traction engine, or similar vehicle, a crane pivotally connected with the vehicle, steering wheels, and a single means for simultaneously moving said crane and said steering wheels to different positions, substantially as set forth.
4. In a mechanism of the class set forth, the combination of adjustable steering wheels, an adjustably mounted crane, a manually controlled power device, operative connections between the said power device and the said steering wheels, and operative connections between the said power device and the said crane, substantially as set forth.
5. In an apparatus of the class described, the combination of a vehicle, a crane adjustably mounted thereon, a power device, and operative connections between the said power device and the said crane, whereby the crane is moved to different horizontal positions, the said operative connections comprising a non-overhauling screw mechanism, substantially as set forth.
6. In a dirigible vehicle, the combination of an axle connected for adjustment about a vertical pivot, vehicle supporting and steering wheels on the axle, and a crane partly supported on the axle to move with it, substantially as set forth.
7. In a dirigible vehicle, the combination of an axle connected for adjustment about a vertical pivot, vehicle supporting and driving wheels on the axle, and a crane connected to the axle to move therewith and movably connected with another part of the vehicle, substantially as set forth.
8. In a traction engine, the combination with an axle connected for adjustment about a vertical pivot, of supporting and steering

wheels upon which the ends of the said axle are supported, and a crane comprising two connected struts which engage the ends of the axle outside of the wheels and serve to hold the wheels in place, substantially as set forth.

9. In a motor vehicle, the combination with steering wheels, of a motor for adjusting said steering wheels, a crane mounted upon said steering wheels and movable therewith, and a separate motor mounted upon the boom of the said crane and adapted to operate the hoisting mechanism, substantially as set forth.

10. In a dirigible vehicle, the combination with steering wheels connected for adjustment about a vertical axis, of a crane adjustably mounted on the vehicle for movement about a vertical axis coincident with that of the steering wheels, and connections between the steering wheels and the crane whereby both may be simultaneously adjusted, substantially as set forth.

11. In a traction engine, the combination with an axle connected for movement about a vertical axis, of supporting and steering wheels upon which the ends of the axle are supported, and a crane provided at its lower end with bearing members which engage the

outer ends of the axle beyond the wheels and serve to support the crane and to secure the wheels against movement along the axle, substantially as set forth.

12. In a dirigible vehicle, the combination of a crane mounted at one end of the vehicle and extending longitudinally therefrom, and mechanism for automatically adjusting the crane toward one side or the other in accordance with the adjustment of the steering wheels of the vehicle, substantially as set forth.

13. In an apparatus of the class described, the combination of a vehicle, steering wheels for the vehicle, a crane mounted in part on the steering wheels and adjustable therewith, a manually controllable motor, and a power connection between the motor and the steering wheels and crane whereby the said steering wheels and crane may be moved to different positions, the said power connection comprising a non-overhauling screw mechanism, substantially as set forth.

In testimony whereof I affix my signature, in presence of two witnesses.

EDGAR J. SOLOMON.

Witnesses:

JAY F. ROTH,
W. N. SPRINGER