No. 634,925. Patented Oct. 17, 1899.

W. D. WEIR.

PORTABLE AND TRANSFORMABLE HOISTING MACHINE, &c.

(Application filed May 9, 1899.)

(No Model.) 2 Sheets—Sheet 1.

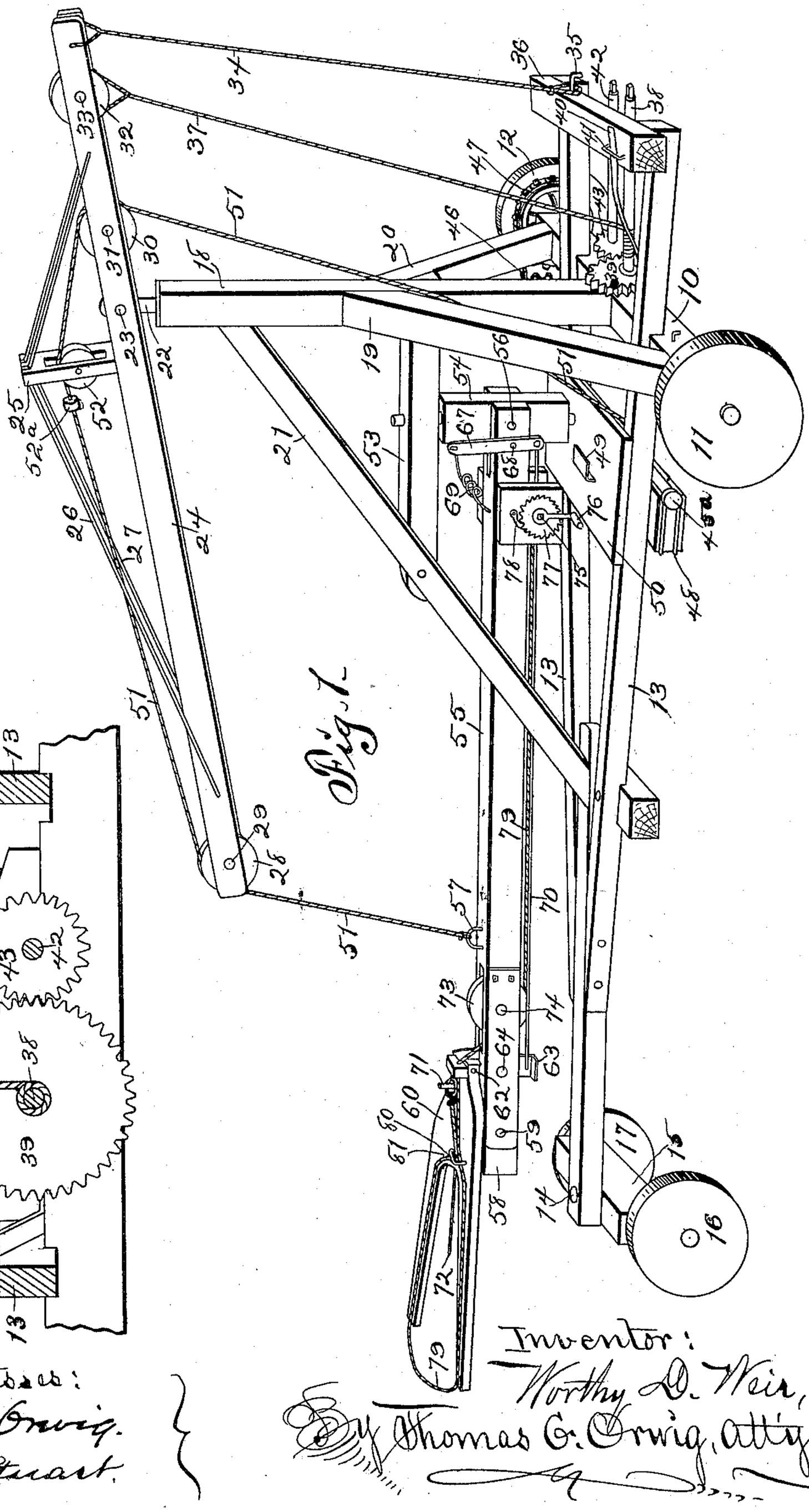

Fig. 1.

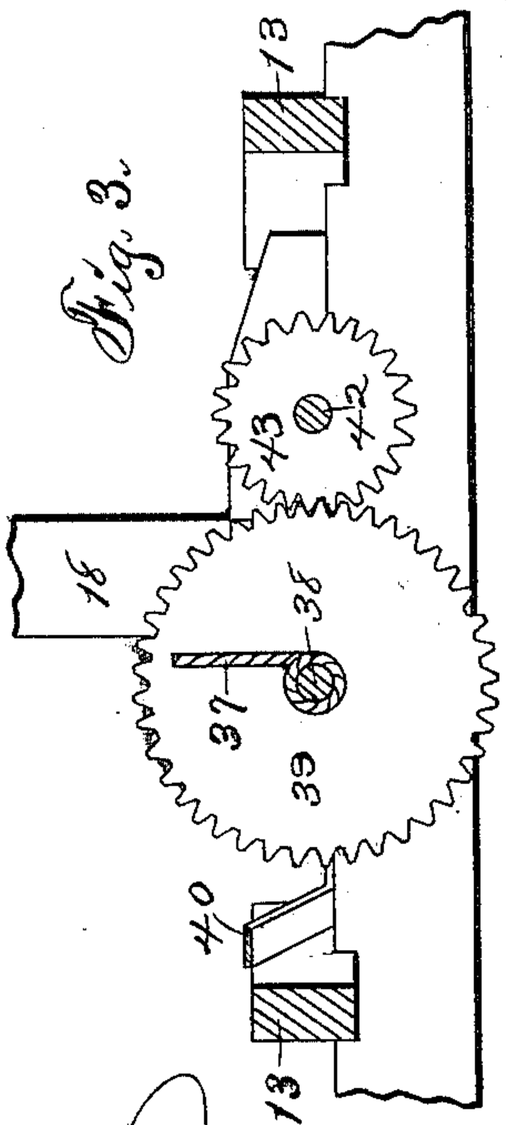

Fig. 3.

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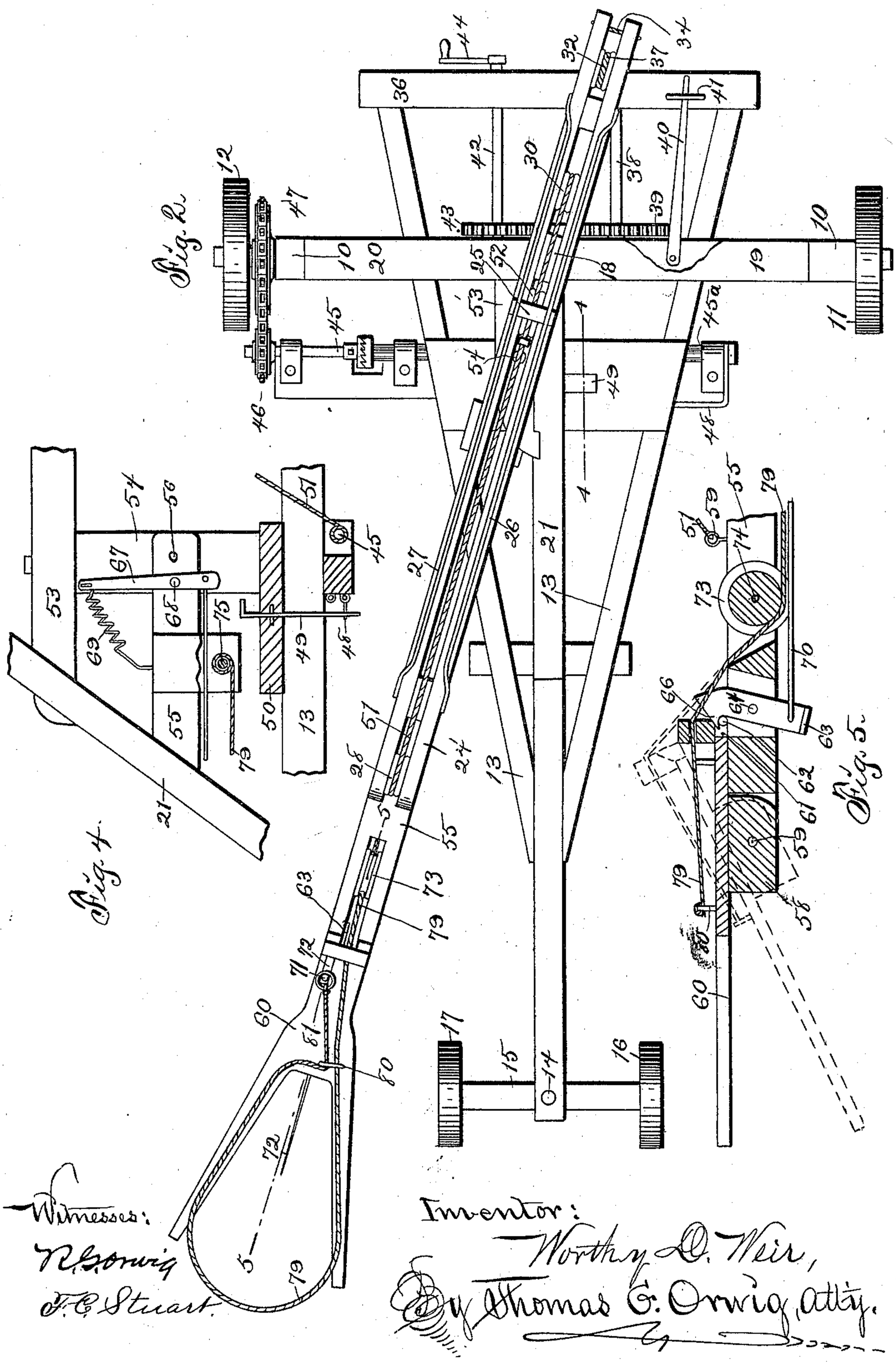

UNITED STATES PATENT OFFICE.

WORTHEY D. WEIR, OF GILMORE CITY, IOWA.

PORTABLE AND TRANSFORMABLE HOISTING-MACHINE, &c.

SPECIFICATION forming part of Letters Patent No. 634,925, dated October 17, 1899.

Application filed May 9, 1899. Serial No. 716,112. (No model.)

To all whom it may concern:

Be it known that I, WORTHEY D. WEIR, a citizen of the United States, residing at Gilmore City, in the county of Pocahontas and State of Iowa, have invented a new and useful Portable and Transformable Hoisting-Machine and Duplex Crane, of which the following is a specification.

The object of this invention is to provide improved means for hoisting and loading corn-shocks and hoisting other heavy objects.

My invention consists in the combination of a wheeled truck, a mast mounted on said truck, a boom swiveled on said mast, means for oscillating said boom on horizontal and vertical axes, a boom swiveled on the truck, a fork hinged to the latter boom, means for binding a corn-shock or other object to said fork, and means for swinging the boom independently or conjunctively.

My invention consists, further, in the provision of means for gearing a hoisting mechanism to the trucks of the machine whereby in the advance of the machine objects may be lifted and conveyed.

My invention consists, further, in the construction, arrangement, and combination of parts hereinafter set forth, pointed out in my claims, and illustrated by the accompanying drawings, in which—

Figure 1 is a perspective of the complete machine. Fig. 2 is a plan of the complete machine. Fig. 3 is a cross-section of the machine on the indicated line 3 3 of Fig. 2. Fig. 4 is a vertical section on the indicated line 4 4 of Fig. 2. Fig. 5 is a vertical section on the indicated line 5 5 of Fig. 2.

In the construction of the machine as shown the numeral 10 designates the main axle, supported at its ends on wheels 11 12. A triangular truck-frame 13 is mounted rigidly at its rear end portion on the main axle 10 and extends horizontally forwardly therefrom. The front end portion of the truck-frame 13 is connected by a king-bolt 14 to a forward axle 15, which axle is supported at its ends by wheels 16 17 and is of less length than the main axle 10. A mast 18 is fixed to and rises from the central portion of the main axle 10 and strengthened by braces 19 20, also fixed to the main axle and converging near the top of the mast. The mast 18 is further steadied and strengthened by a brace 21, fixed to and extending upwardly and rearwardly from the central portion of the truck-frame 13 to a point of attachment to the mast above the converging ends of the braces 19 20. A shaft 22 is stepped in the upper end of the mast 18 for rotation on a vertical axis, and a pin 23 is seated in and transversely of the upper end portion of said shaft. A boom 24 is fulcrumed intermediate of its ends on the pin 23, and a standard 25 is fixed to and rises from said boom adjacent to its fulcrum. Truss-rods 26 27 are fixed at their ends to the end portions of the boom 24 and are arched over and rest upon the upper end of the standard 25 and form a truss for the boom. The forward end portion of the boom 24 is bifurcated, and a sheave 28 is mounted therein and supported by a pin 29, traversing the bifurcation. A sheave 30 is mounted in a slot of the boom 24 at the rear of the pin 23 and is supported by a pin 31, horizontally seated in and traversing the boom. A sheave 32 is positioned in a slot of the boom at the rear of the rear ends of the truss-rods 26 27 and is supported by a pin 33, seated in and transversely of said boom. A cable 34 is fixed at its upper end to the rear end portion of the boom 24 and is of such length that it may be secured to a hook 35, rearwardly projecting from a cross-bar 36 on the rear end of the truck-frame 13, and hold said boom in a given position relative to the horizontal. The cable 34 also may be employed to swing the boom 24 laterally by manual force. A cable 37 is fixed at its upper end to the sheave 32 and at its lower end to a drum-shaft 38, mounted for rotation in bearings on the truck-frame. The drum-shaft 38 is formed with an angular rear end portion projecting rearwardly from the truck-frame, and a gear-wheel 39 is fixed to the forward end portion of said drum-shaft adjacent to the lower end of the mast 18. A pawl 40 is fulcrumed at one end on and extends rearwardly from the axle 10 and is limited as to lateral movement by a yoke 41, seated in the cross-bar 36 and embracing its rear end portion. The pawl 40 may be oscillated or moved laterally into and out of engagement with the teeth of the gear-wheel 39 by manual operation, and it is the function of said pawl to lock said gear-wheel and the drum-shaft 38

against rotation. A counter-shaft 42 is mounted in the truck-frame parallel with the drum-shaft 38, and a gear-wheel 43 on the counter-shaft meshes with the gear-wheel 39 on the drum-shaft. The counter-shaft 42 also is formed with a rearwardly-projecting angular end portion, and the gear-wheel 43 is of materially less diameter than the gear-wheel 39 meshing therewith. A crank 44, Fig. 2, may be mounted on either of the angular end portions of the shafts 38 42 and employed to rotate said shafts by manual force.

A drum-shaft 45 is mounted parallel with and in front of the axle 10 and supported in bearings fixed to and depending from the truck-frame. A sprocket-wheel 46 is mounted rigidly on one end portion of the drum-shaft 45 and engages by sprocket-chain 46[a] a sprocket-wheel 47 on the inner side of and of materially less diameter than the supporting-wheel 12. A yoke 48 embraces the end portion of the drum-shaft 45 opposite the sprocket-wheel 46 and is connected with a lever 49, fulcrumed in a vertical position for oscillation on a horizontal axis in a platform 50, mounted on the truck-frame. The lever 49 may be oscillated manually to the reciprocation of the yoke 48 and the drum-shaft 45, whereby the sprocket-wheel 46 may be released from and connected with drum-shaft 45 by means of clutch in said drum-shaft 45. A cable 51 is connected at one end to and arranged to be wound upon the drum-shaft 45 and extends therefrom between the brace 19 and mast 18 over the sheave 30, sheave 52 in the standard 25, the sheave 28, and depends at its forward end. A header 53 is horizontally positioned and connects the central portions of the brace 21 and mast 18. A post 54 is stepped in the platform 50 in a vertical position and the upper end of said post is pivoted in the header 53. A boom 55 is pivotally mounted at its rear end on a pin 56, seated in and transversely of the central portion of the post 54. An eye 57 in the forward end portion of the boom 55 is connected to the lower end portion of the cable 51. The forward end portion of the boom 55 is bifurcated, and a block 58 is mounted therein for oscillation on a pin 59, horizontally seated in and traversing the bifurcation. A fork 60 is mounted rigidly on and extends forwardly from the block 58, and a notch 61 is formed in the rear end of said fork. A rod 62 is mounted transversely of the rear end of the fork 60 and traverses the notch therein. A lever 63 is mounted for oscillation on a pin 64, seated in and transversely of the bifurcated end portion of the boom 55, and extends above and below said boom. A hook-lip 66 is formed on the forward edge of the upper end portion of the lever 63, and the extremity of said lever is apexed and attenuated above the lip. It is the function of the lip 66 to engage the rod 62 and retain the fork 60 in a plane parallel with the boom 55. A lever 67 is fulcrumed intermediate of its ends on a pin 68, seated in and projecting laterally from the rear end portion of the boom 55, and the upper end portion of said lever is connected to the boom by a coil-spring 69. The lower end portion of the lever 67 is joined to the lower end portion of the lever 63 by a connecting-rod 70, extending parallel with and beneath the boom 55. The lever 67 may be operated manually to release the hook-lip 66 from the fork 60 and permit said fork to assume the position shown by dotted lines in Fig. 5, and said lever is repositioned to set the hook-lever for reëngagement by the fork by the retractile resilience of the spring 69. A guide-pin 71 is seated in and extends vertically from the forward end portion of the boom 55 and traverses a slot 72 in the rear end portion of the fork 60. It is the function of the pin 71 to restrain the fork 60 against lateral vibration and receive a ring in end of the cable 79 when binding the shock. A pin 72 is fixed in a horizontal position and extends forwardly between the arms of the fork 60. A sheave 73 is mounted in a slot in the boom 55 at the rear of the lever 63 and supported by a pin 74, horizontally seated in and traversing said boom. A drum-shaft 75 is mounted for rotation in bearings depending from the rear end portion of the boom 55 and is provided with a crank 76 on one end, whereby the shaft may be rotated. A ratchet-wheel 77 is fixed to the shaft 75 and is engaged by a pawl 78 to lock the shaft against rotation in one direction. A cable 79 is fixed at one end to and arranged to be wound upon the drum-shaft 75, extends forwardly from the said drum-shaft beneath the boom 55, under the sheave 73, through an aperture in the rear of the fork 60, and thence through an eye 80, mounted in and above said fork, and terminates in a ring 81, which ring passes over guide-pin 71 and is automatically released by the dropping of the fork.

When a corn-shock is to be lifted, the machine is advanced with the parts in the position shown in Fig. 2 until a shock or bundle of corn standing upright is received between the arms of the fork 60 and penetrated by the pin 72. The forward end portion of the cable 79 is then looped around the shock of corn and the ring 81 is dropped over the guide-pin 71. Manual force is then applied to the crank 76 to wind the rear portion of the cable 79 on the drum-shaft 75 to such an extent as to draw said cable taut and securely bind the bundle of corn in the fork 60. The machine may then be advanced, and the sprocket-wheel 47, acting on the sprocket-wheel 46 through the sprocket-chain, will rotate the drum-shaft 45 and wind the cable 51 thereon, thus drawing said cable through sheaves 30 52 28 and lifting the boom 55, fork 60, and corn until a stop 52[a] in cable 51, operating on rear end of boom 24, raises both booms conjunctively, thereby loosening cable 34 and giving conjunctive automatic lateral motion of both booms to the right by the winding of cable 37 on drum-shaft

38 to the left, thus bringing the load over the place of deposit without manual labor. The lever 67 may now be operated manually to release the lever 63 from the fork 60 and said fork will assume the position shown by dotted lines in Fig. 5, permitting the load to slide from the fork and drop to the wagon.

The boom 55 may be entirely omitted and the load suspended from the forward end portion of the cable 51, thus providing means for elevating, swinging, and positioning a load of any character.

The cable 37 should be omitted and the cable 51 run through the sheaves 28, 52, and 30 and attached at its rear end to the drum-shaft 38 instead of to the drum-shaft 45 for other hoisting.

I claim as my invention—

1. A hoisting-machine comprising a wheeled truck, a boom swiveled thereon and arranged for positioning longitudinally thereof and parallel therewith, a fork hinged to the outer end of the boom, a hooked lever mounted in the boom and arranged to engage said fork, a lever mounted at the inner end of the boom, and connected with the hooked lever, a drum-shaft on the inner end of the boom and arranged for manual actuation, a cable fixed to the drum-shaft and extended along the boom and through an eye on the fork, a ring on the extremity of the cable, a pin on the fork arranged to be engaged by the ring and rope and windlass mechanism for elevating the boom.

2. A hoisting-machine, comprising a wheeled truck, a post loosely mounted thereon, a boom pivoted at its inner end in said post and arranged for vertical oscillation relative thereto, rope and windlass mechanism for raising and lowering said boom, a fork hinged to the outer end of the boom, a hooked lever fulcrumed in the boom and arranged to engage said fork, a lever fulcrumed on the post, which latter lever is arranged for manual actuation in one direction and spring actuation in the opposite direction, a cable connecting said levers, a drum-shaft in the inner end of the boom and arranged for manual actuation, and a cable attached to said drum-shaft and extended forward along the boom and arranged for looping at its forward end around an object to be lifted.

3. In a machine of the class described, the combination of the boom, the fork hinged thereon, the pin in the fork and projecting between the arms thereof, the cable arranged for looping around an object to be lifted, means for drawing said cable taut and releasing the same, means for holding and releasing said fork and means for raising and lowering the boom.

4. The combination of the wheeled truck, the boom swiveled thereon, the fork hinged to said boom; means for locking the fork parallel with the boom, a lever and connections for releasing the lock of the fork, the binding-cable and means for winding said binding-cable.

5. The combination of the wheeled truck, the mast thereon, the boom swiveled on the mast, the boom swiveled on the truck, and a draft-cable carried by the first boom and carrying the latter boom and means for applying draft to said cable.

6. The combination of the wheeled truck, the mast thereon, the boom swiveled on the mast, means for oscillating said boom, an elevating-cable carried by said boom, a boom swiveled on the truck and attached to the elevating-cable and means for applying draft to said elevating-cable.

7. In a machine of the class described the traction-wheel 12, the sprocket-wheel 47 mounted thereon, the drum-shaft 45, the sprocket-wheel 46 mounted on the drum-shaft and engaging the sprocket-wheel 47, by means of a sprocket-chain, the yoke 48 and the lever 49 connected with the drum-shaft and arranged to reciprocate said shaft to move the sprocket-wheel 46 into or out of engagement with the sprocket-wheel 47 by way of clutch in shaft.

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