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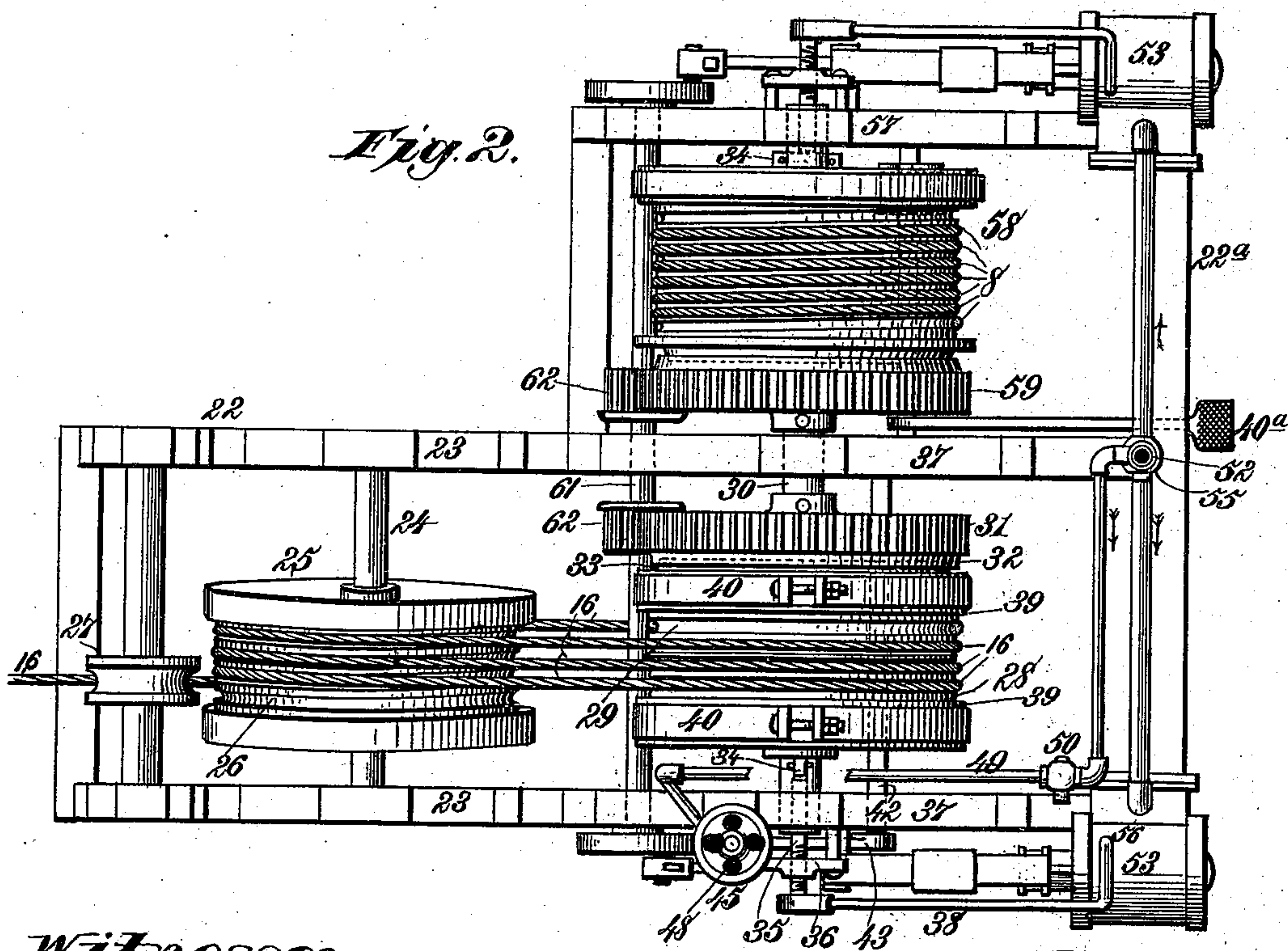
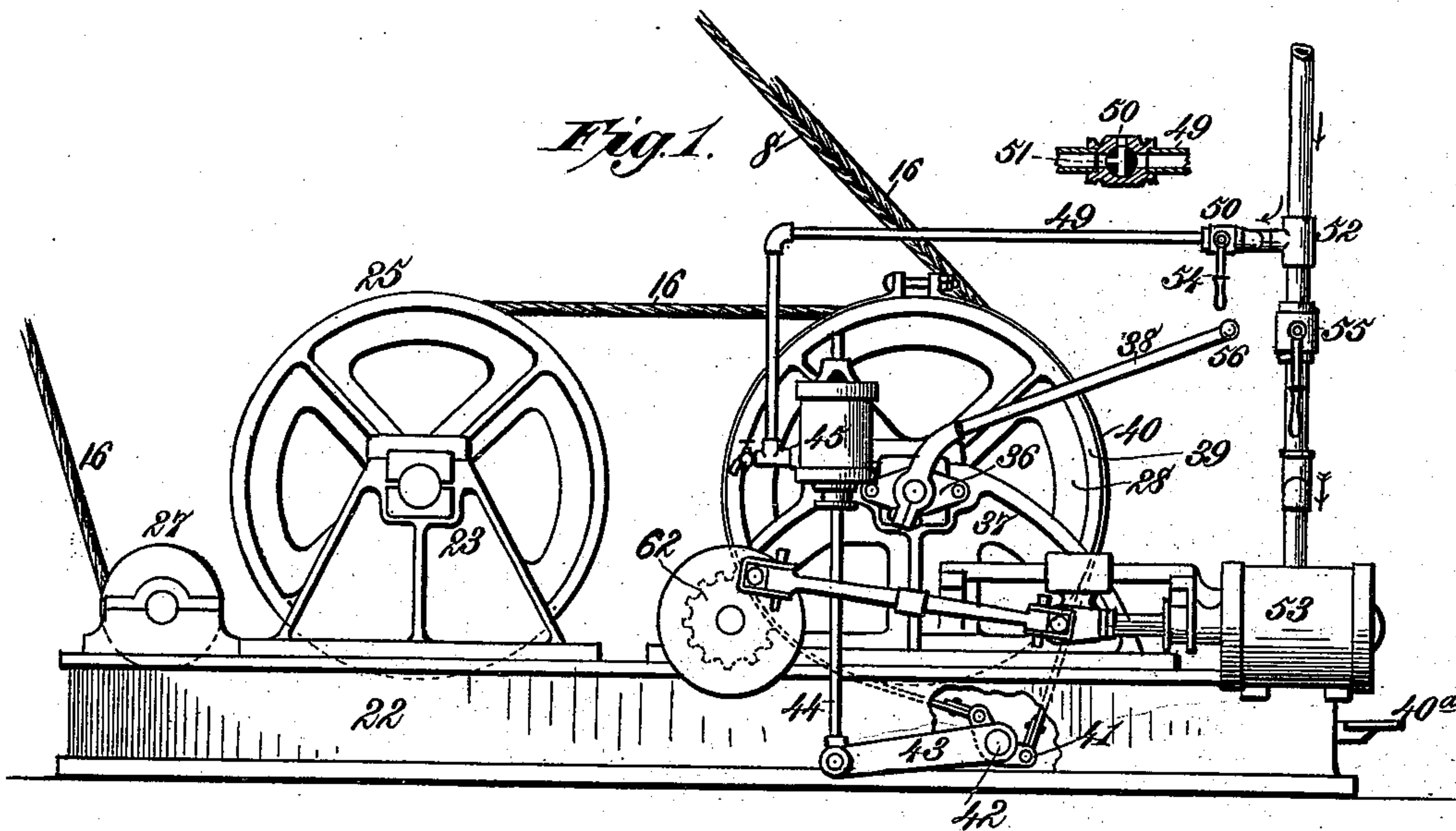
2 Sheets—Sheet 1.

M. W. LOCKE.

HOISTING AND CONVEYING MACHINE.

No. 377,947.

Patented Feb. 14, 1888.



Witnesses.  
*Robert G. Smith,*  
*Frost, Rea,*

Inventor.  
*Milo W. Locke,*  
By *James L. Norris,*  
*Atty.*

(No Model.)

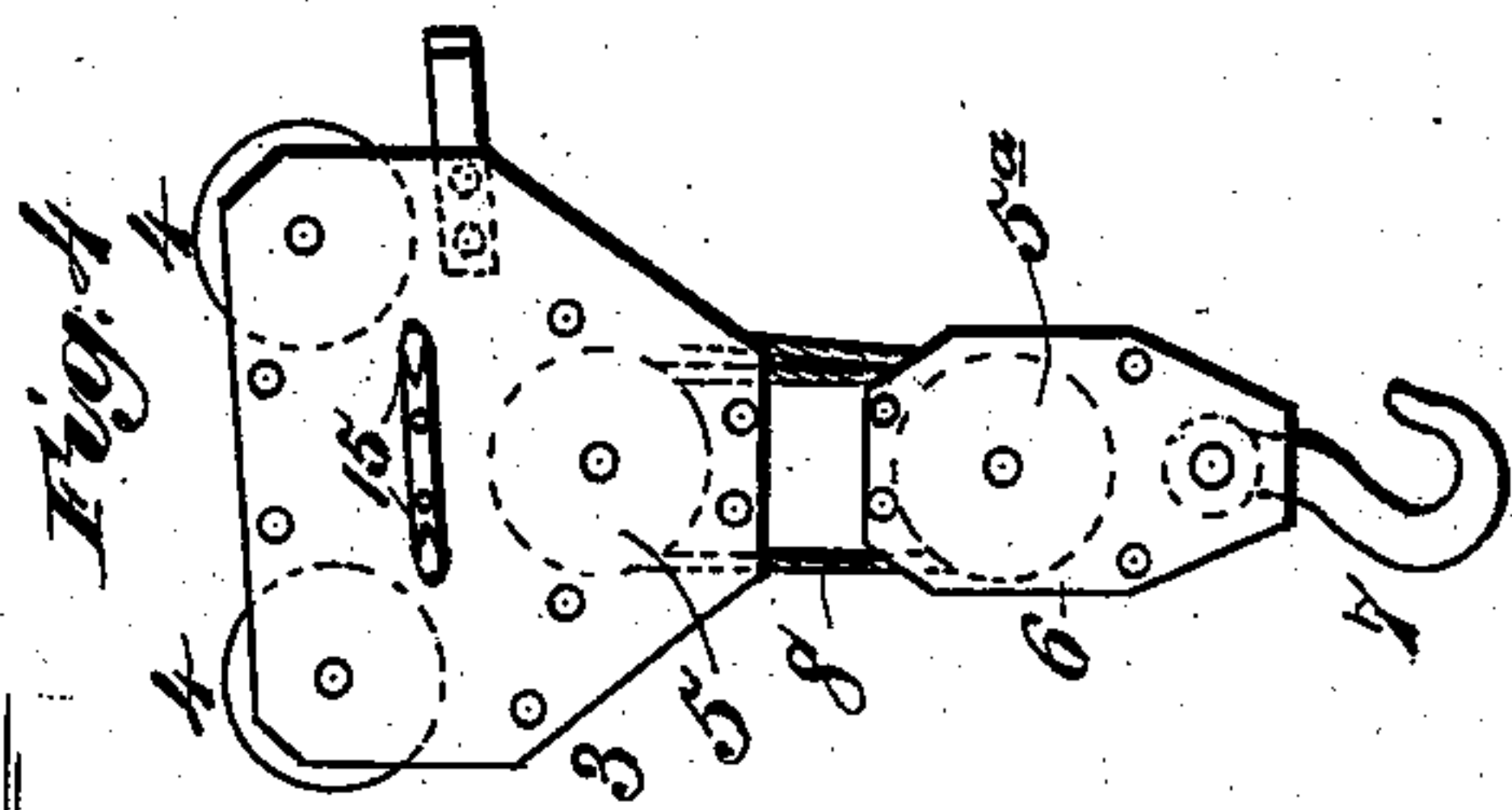
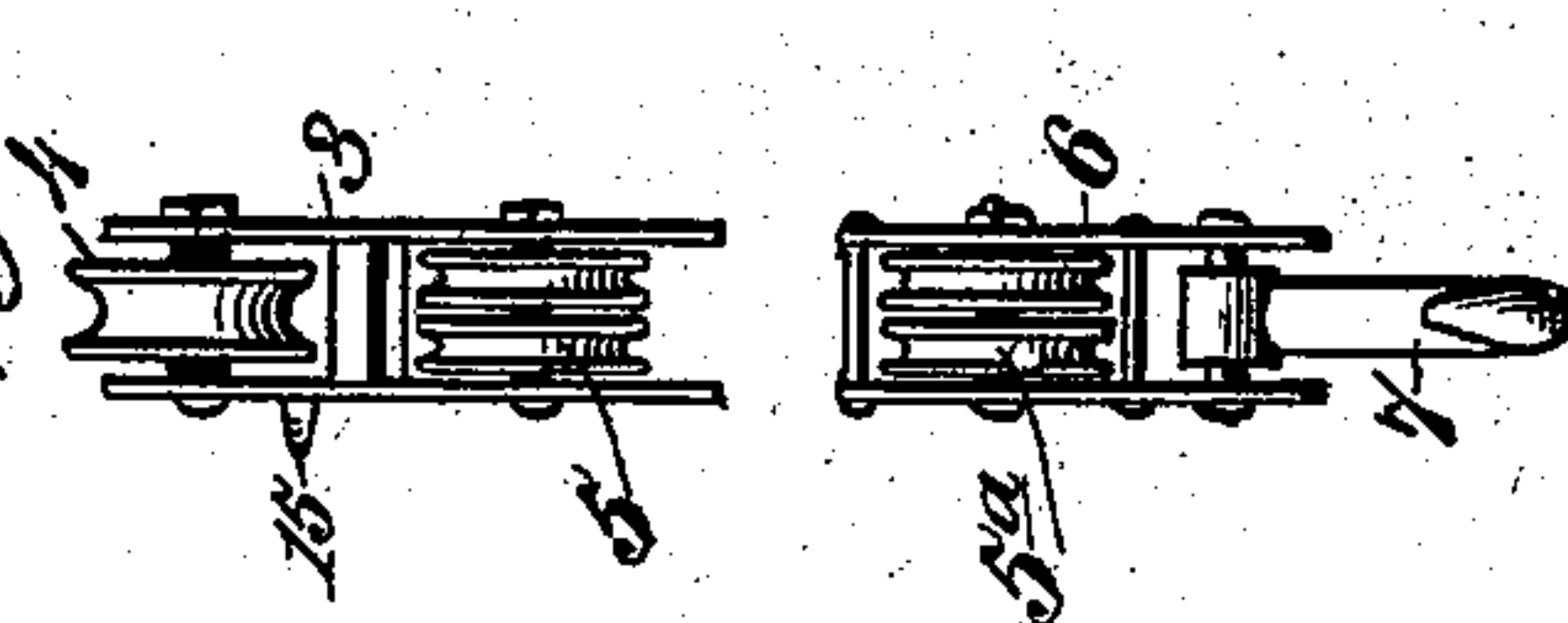
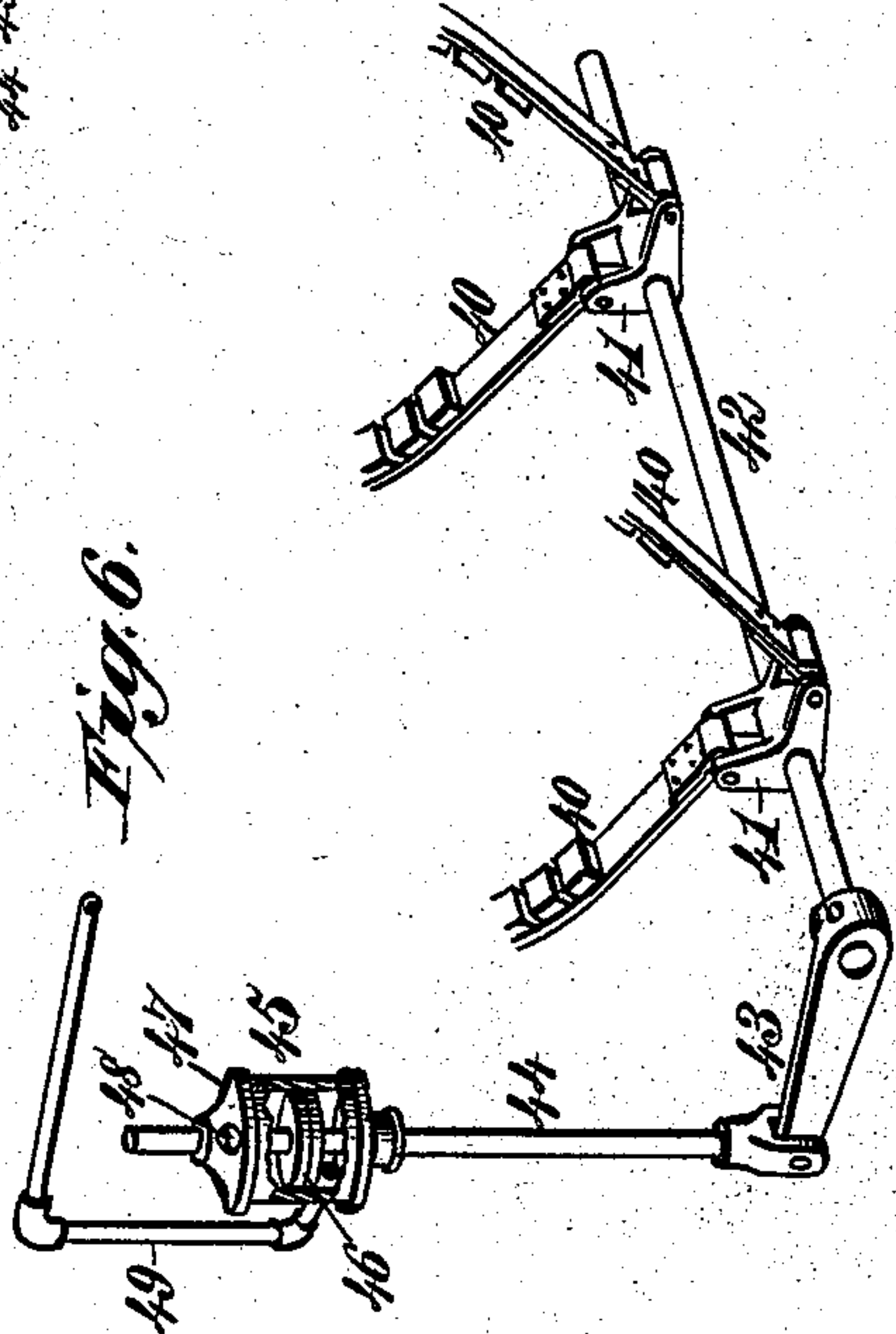
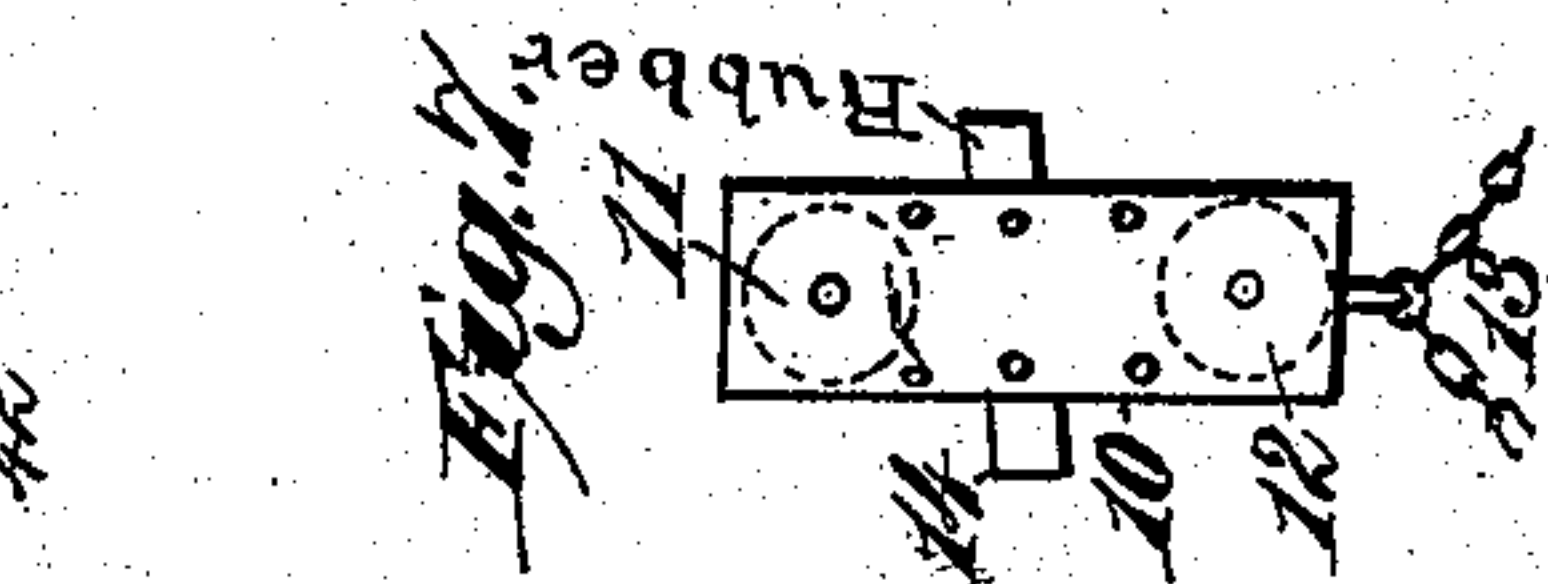
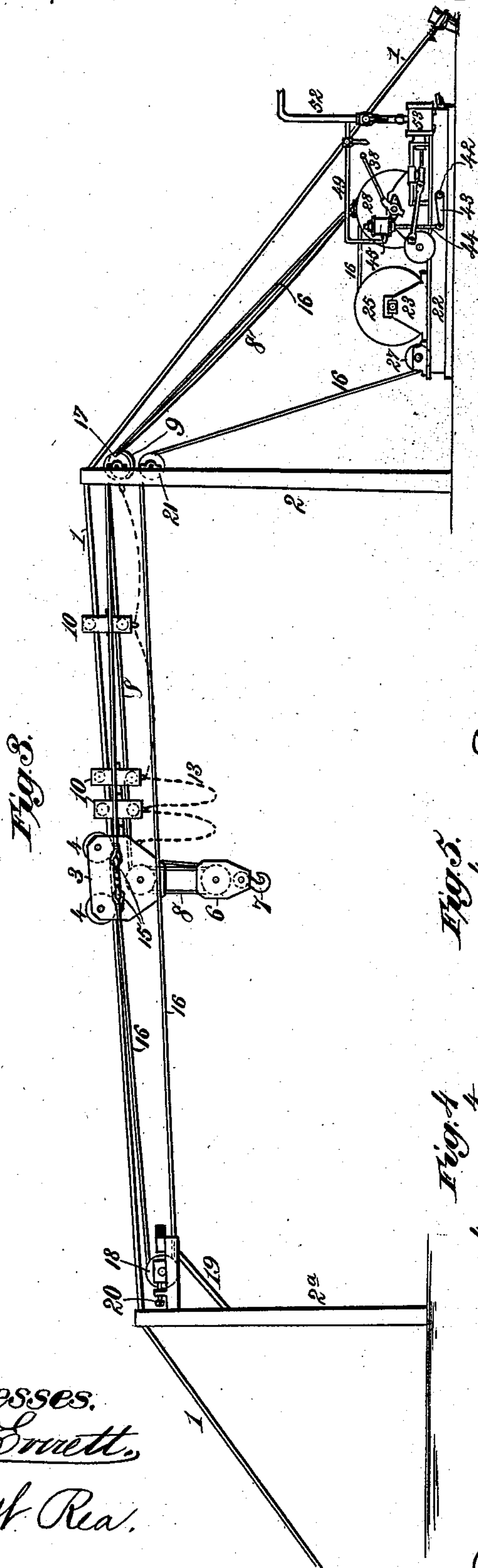
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M. W. LOCKE.

HOISTING AND CONVEYING MACHINE.

No. 377,947.

Patented Feb. 14, 1888.



Witnesses.  
*Robert Emmett.*  
*Geo. H. Rea.*

Inventor.  
*Milo W. Locke.*  
By *James L. Norris.*  
*Atty.*



# UNITED STATES PATENT OFFICE.

MILO W. LOCKE, OF WILMINGTON, DELAWARE.

## HOISTING AND CONVEYING MACHINE.

SPECIFICATION forming part of Letters Patent No. 377,947, dated February 14, 1888.

Application filed August 16, 1887. Serial No. 247,093. (No model.)

*To all whom it may concern:*

Be it known that I, MILO W. LOCKE, a citizen of the United States, residing at Wilmington, in the county of New Castle and State of Delaware, have invented new and useful Improvements in Hoisting and Conveying Engines, of which the following is a specification.

The present invention is an improvement upon that for which Letters Patent of the United States were granted to me March 25, 1884, No. 295,776.

The purpose of my invention is to provide such a construction and organization of parts in a hoisting and conveying engine as to enable the engineer to instantaneously lock the drum of the conveying-rope, whereby the carriage is drawn back and forth upon the cable, to hold the same with a constant force for any required period, the whole being accomplished by the operation of a simple valve.

It is my further purpose to provide a simple construction and arrangement whereby the fall-rope, by which the load is hoisted to and lowered from the carriage, may be paid out and taken in simultaneously with the conveyer-rope and with equal speed, the separate drums being so mounted upon the same shaft that they may revolve together or the conveyer-drum be locked rigidly, to hold the carriage motionless while the drum of the fall-rope is revolved to lift or lower the load. By this improvement I am enabled to dispense with a positive locking device between the carriage and the tackle-block, as well as to obviate the necessity of employing a grip to lock the carriage to the cable at points where it is desired to take or deposit a load.

It is also my purpose to simplify and improve the several parts and combinations of parts composing said mechanism.

The invention consists in the several novel features of construction and new combinations of parts, hereinafter fully described, and definitely pointed out in the claims which follow this specification.

In the accompanying drawings, Figure 1 is a side elevation of an engine embodying my invention. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the cable or track, together with the engine in position for operation. Fig. 4 is a side elevation of the carriage and tackle-block removed from the cable.

Fig. 5 is an edge view of the parts shown in Fig. 4. Fig. 6 is a perspective of the parts composing the lock for the conveyer-drum, together with the devices by which said lock is operated. Fig. 7 is a side elevation of one of the fall-rope carriers or slack-supporters.

In the said drawings the reference-numeral 1 denotes a wire cable anchored strongly at each end and carried by supports 2 of any proper form or construction. Upon this cable runs a carriage, 3, consisting of metal plates, between which are journaled grooved rolls 4, which run upon the cable. Below these traveling rolls are journaled pulleys 5, over which runs a wire rope connecting the carriage to a block, 6, having a hook or other suitable device, 7. The wire rope 8, which I may term the "fall-rope," after passing over the pulleys 5 and around the similar pulleys, 5<sup>a</sup>, in the block 6, is carried toward one end of the cable, passes over a pulley, 9, on the cable-support 2, and thence to the engine. This rope is supported at suitable intervals by means of carriers or slack-supporters 10, which have rolls 11 traveling upon the cable 1 and lower rolls, 12, upon which the fall-rope may rest. A spacing chain or rope, 13, is fastened at one end to the carriage 3 and at the other to the cable-support 2, and at stated intervals between its ends it is connected to the carriers. These devices support the slack of the rope when run out to any considerable length. When the rope is drawn in, the carriers are brought together, as shown in Fig. 3, rubber bumpers 14 being provided to prevent too close contact.

Upon the outside of one of the metal plates of the carriage 3 are attached eyes 15, to which are connected the two ends of an otherwise endless rope, 16. Starting from the engine, this rope runs over a pulley, 17, on the support 2, thence to the opposite end of the cable-line, where it passes over a pulley, 18, mounted upon a supporting-bracket, 19, the latter being carried on a post or other support, 2<sup>a</sup>. This pulley may be adjusted by a screw, 20, to tighten the rope 16, and from said pulley the rope runs over a fixed pulley, 21, placed on the support 2 beneath the pulley 17. From the latter point it returns to the engine.

The hoisting and conveying mechanism consists of a bed-piece, 22, upon which are brack-



ets 23, in which is journaled a shaft, 24, having its axis inclined and carrying a drum, 25. This drum is provided with a series of circumferential grooves 26, to receive the rope 16, which is guided to the first groove by a pulley, 27. In rear of the drum 25 is a rope-drum, 28, having grooves 29 and carried by a horizontal shaft, 30. This drum is normally loose upon the shaft 30, but is caused to revolve therewith by the following means:

Rigidly mounted upon the shaft is a large gear, 31, having upon one vertical face a chuck-annulus, 32, provided with an outwardly-expanding seat, against which bears an engaging-ring, 33, on the drum. Upon its outer end the shaft is provided with a slot, in which lies a key or wedge, 34, bearing against the drum. Against this key bears a bar, 35, provided with a thread which takes into a threaded yoke-piece, 36, outside the bracket 37, in which the shaft is journaled. Upon its end this bar has a crank-lever, 38, by which the bar may be either thrown against the key 34 and the clutch-surfaces between the gear 31 and the drum 28 engaged, thereby causing the drum to revolve with the gear; or the parts may be disengaged from each other, allowing the shaft to revolve without affecting the drum. These are all of known construction.

Upon each end the rope-drum is provided with a broad locking-pulley, 39. Over or around each pulley runs a brake-band, 40, of any suitable construction. The ends of each brake-band are connected to double bell-cranks 41, rigid on a rock-shaft, 42, journaled beneath the drum. Upon the end of this rock-shaft is a crank-arm, 43, to the end of which is connected a piston-rod, 44, the upper extremity thereof entering a cylinder, 45, where it is connected to a piston, 46. I have shown the piston-rod prolonged and the upper end of the cylinder provided with a cap, 47, through which the piston-rod passes to give it additional bearing. The cap 47 is provided with an air-opening, 48, to allow the free movement of the piston without creating a partial vacuum above the piston, and steam is introduced beneath the piston by means of a pipe, 49, having a three-way cock, 50. This cock is provided with a diametrical passage, 51, and a central passage at right angles thereto, whereby the piston may be raised and held for any length of time, or the steam may be exhausted by giving a quarter-turn to the valve. The steam-pipe 49 is a branch from the pipe 52, which supplies the cylinders 53, by which the drum 28 is revolved. In said steam-pipe is placed the three-way cock 50, as already described, provided with a lever, 54, by which it is turned. This lever may conveniently be arranged near the pipe 52 and the valve 55, which opens the steam-passage to the cylinder 53, whereby the engineer may operate both from the same standpoint. The handle 56 of the lever 38 is also brought into proximity with said parts.

Upon the side of the bed-piece 22 is an ex-

tension, 22<sup>a</sup>, containing bearings 57 for the prolonged shaft 30, which carries the rope-drum 28. Upon this prolonged shaft is mounted a drum, 58, which is in all essential respects the counterpart of the drum 28, being of similar diameter, driven by a gear, 59, to which it is clutched and unclutched in the manner already set forth in connection with the rope-drum 28. The only points of difference are that the drum 58 is somewhat greater in length, is spirally grooved, and has a foot or hand brake, 40<sup>a</sup>, but no steam-lock. The brake is of the same construction as that used on the rope-drum, save that it is operated by manual power. It is operated by one of the cylinders 53, which drives one end of the shaft 61, having a small gear, 62, meshing with the gear 59. This drum takes the hoisting or fall rope 8, already described.

The conveyer-rope 16, after passing under the pulley 27, goes into the first groove on the lower side of the drum 25 and thence into the corresponding groove of the rope-drum 28. Thence it passes over the latter and back into the second groove of drum 25, around the latter, and back to drum 28. In this manner the rope is carried around these drums as many times as may be necessary to prevent the endless rope from slipping, and said rope finally passes back over the pulley or the support 2 to the carriage.

From the construction thus described it will be seen that both the hoisting-rope and the conveyer-rope are operated by the same shaft and by equal drums. Thus any positive connection or lock between the tackle-block and carriage is dispensed with. At the same time either drum may be operated separately. Thus when a load is to be taken the carriage is moved over the spot, both the conveyer-rope and the fall-rope moving together. The drum 28 is then locked and unlatched from its gear 31, and the fall-rope is paid out until the tackle-block is lowered to the proper point, which may be accomplished by simply unclutching the drum 58 from the gear 59. When the load is made fast to the block, the whole is hoisted to the proper point, whereupon the rope-drum 28 is again clutched to its gear 31 and unlocked by shutting off the steam from the cylinder 45. Both drums now move together until the point is reached where the load is to be dropped, whereupon the rope-drum 28 is again unclutched and locked, and the block is then lowered with the load.

It will be seen that by employing the continuous or practically continuous conveyer-rope and locking the drum 28, I am able to dispense entirely with any grip or similar mechanism for anchoring the carriage.

The parts shown in Figs. 4, 5, and 7 form no part of this application.

What I claim is—

1. The combination, with a cable and with a carriage running thereon, of a rope having its ends connected to said carriage, a guiding or forward drum and a rope-drum, around both of



which the rope is carried in successive coils, a brake-band for the rope-drum, a hoisting-drum of equal diameter on the same shaft therewith, and a tackle-block connected to the carriage by the hoisting-rope, substantially as described.

2. The combination, with a cable and with a carriage running thereon, of a grooved guide-drum having an inclined axis, a grooved rope-drum in rear thereof, a conveyer-rope passing over pulleys on the cable-support and around both drums and having its ends connected to the carriage, a hoisting-drum on the same shaft

with the rope-drum, means for clutching and unclutching either drum separately, a brake-band for the rope-drum, and a tackle-block connected to the carriage by a hoisting-rope carried by the hoisting-drum, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

MILO W. LOCKE.

Witnesses:

FRANK E. SMITH,  
HARRY A. WINKS.