

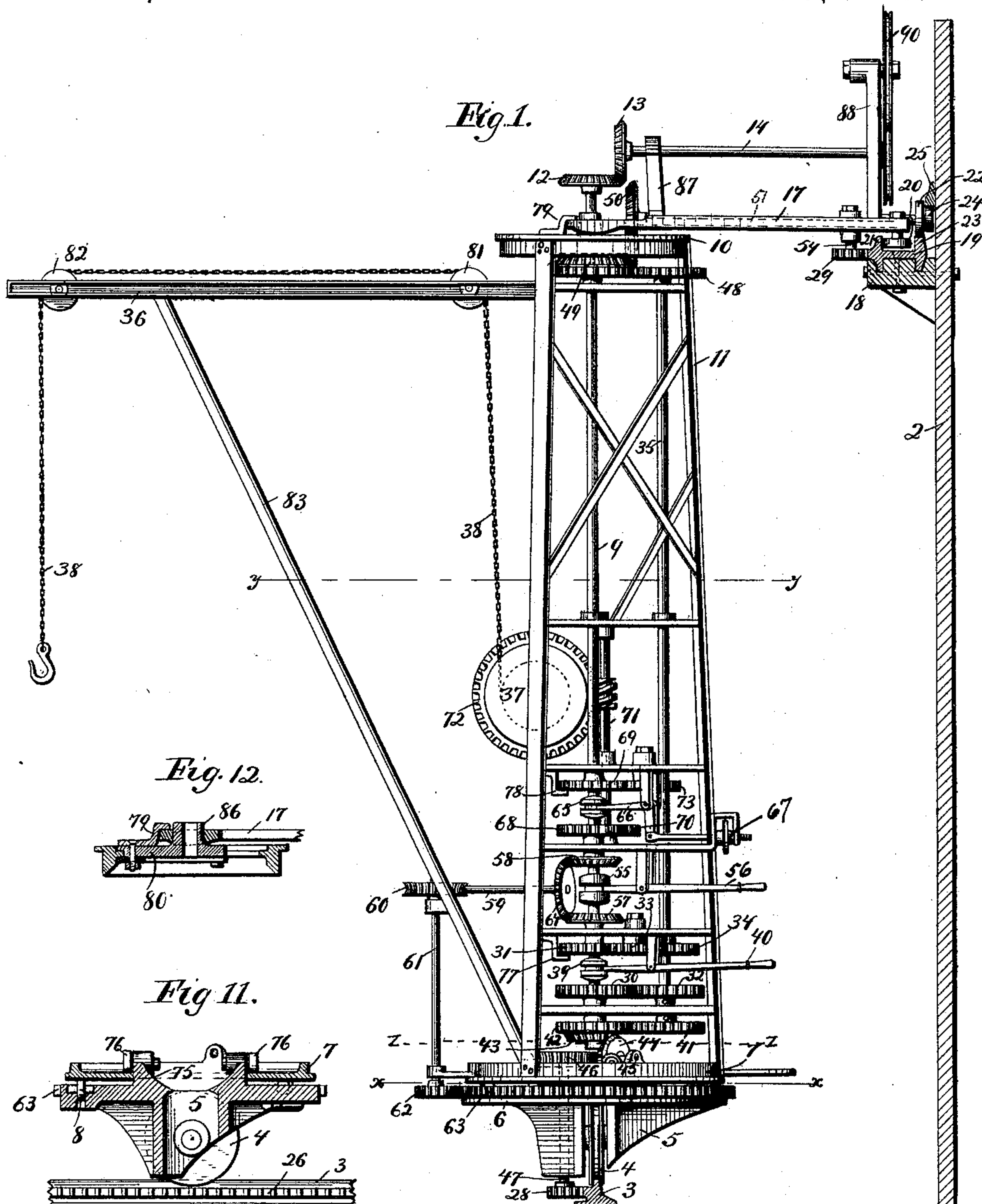
(No Model.)

4 Sheets—Sheet 1.

O. HOLM.
TRAVELING DERRICK.

No. 414,218.

Patented Nov. 5, 1889.



Witnesses.

J. Jensen.
a. m. gaskill

Inventor.

Olof Holm.

By Paul Merwin atty

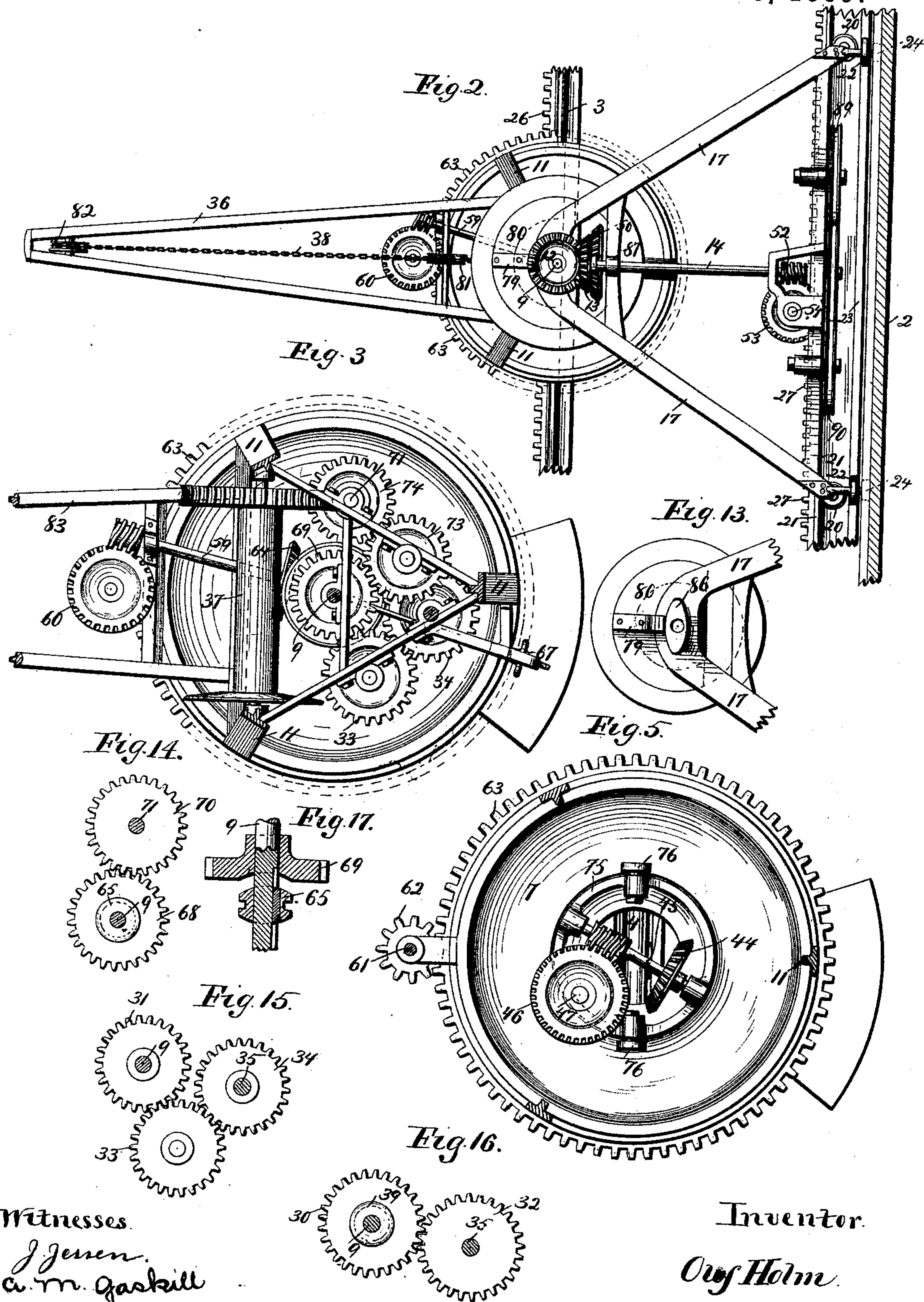
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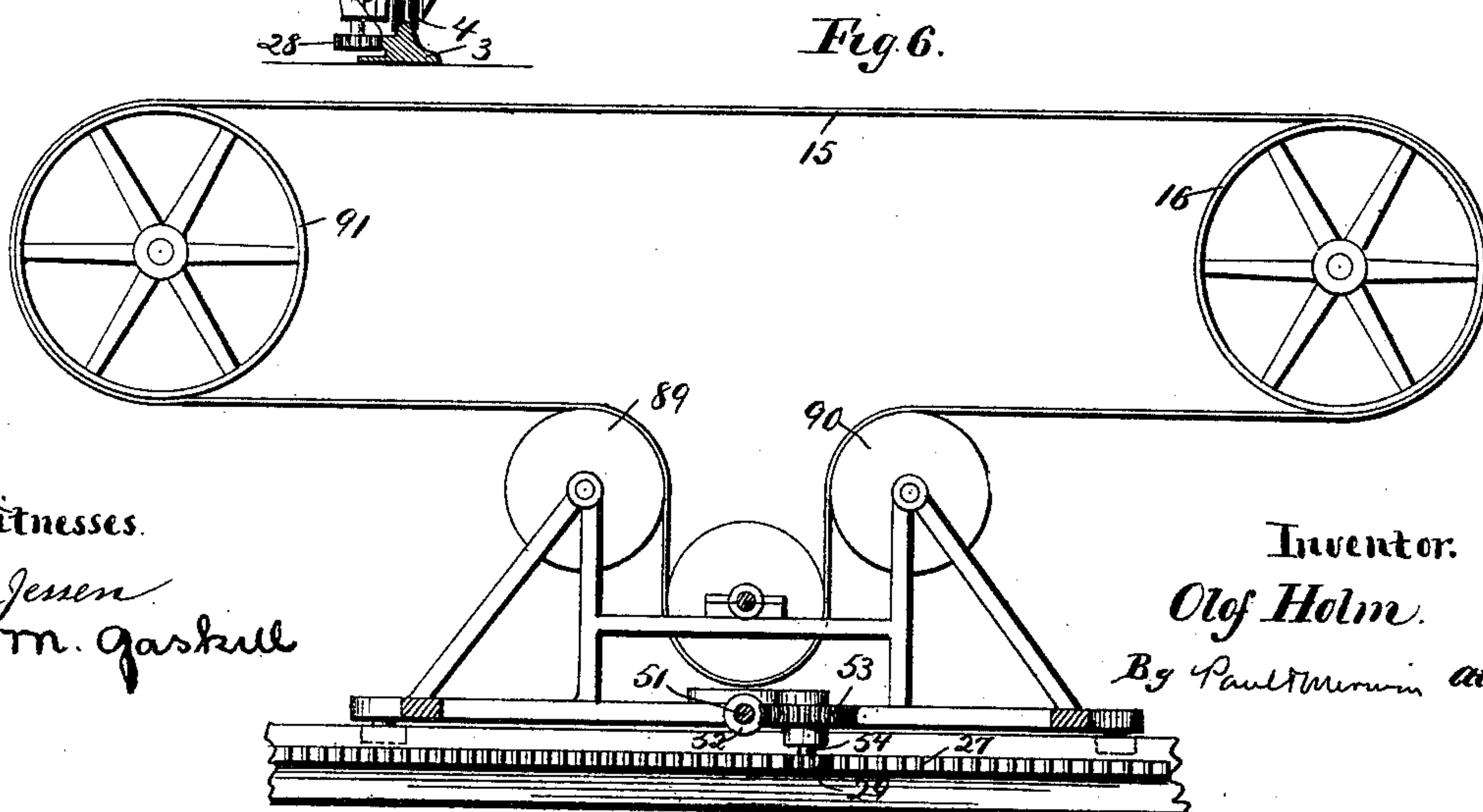
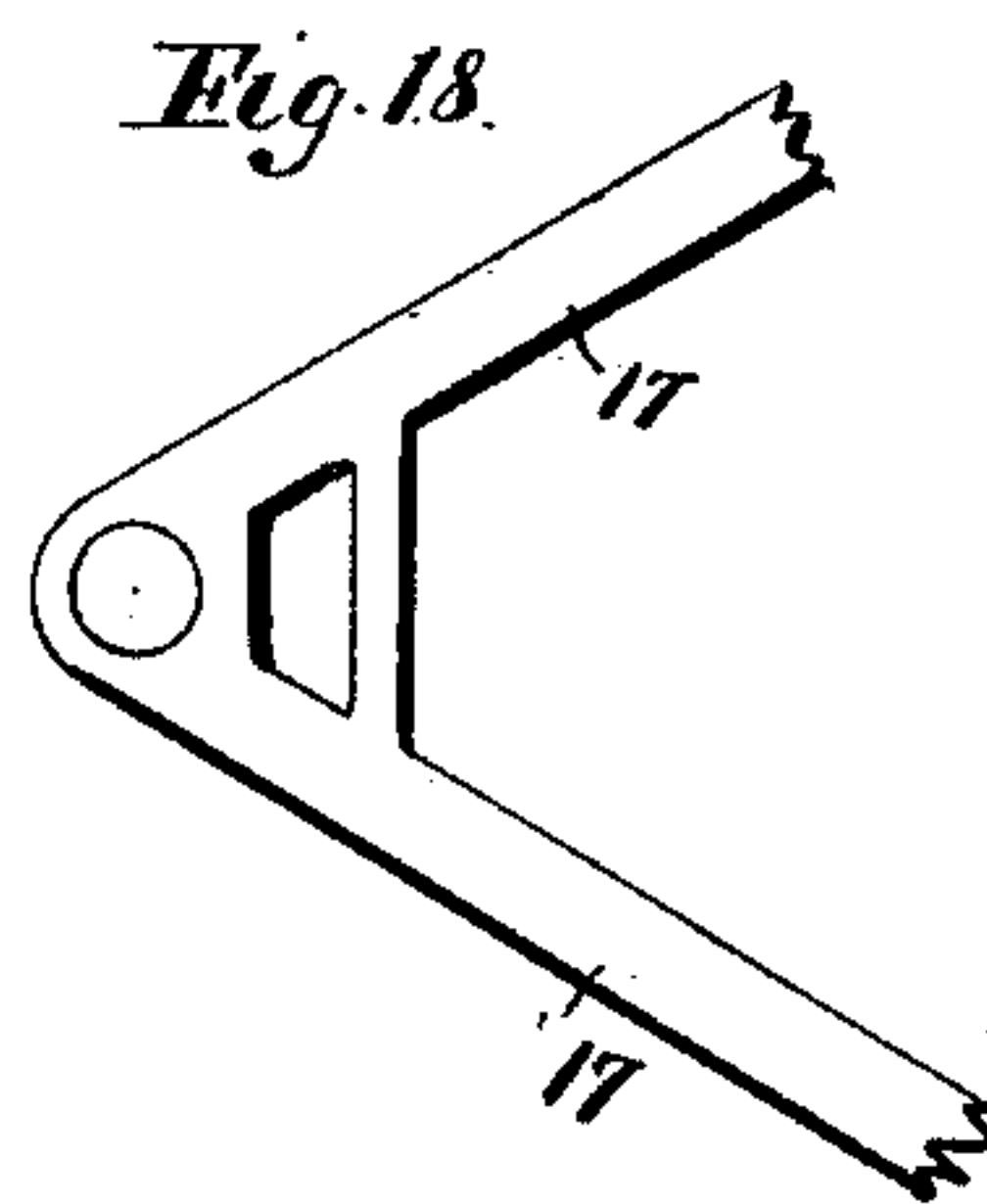
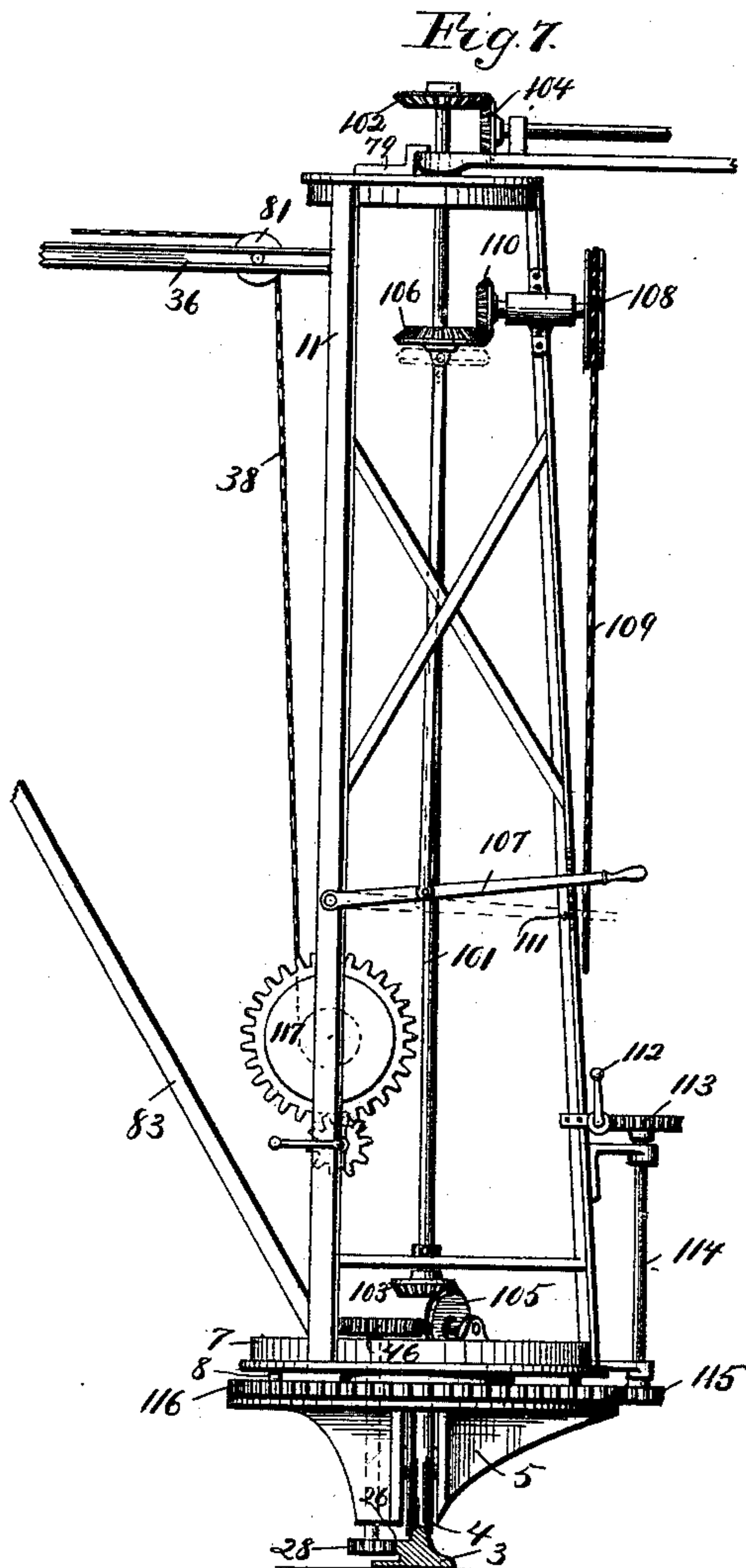
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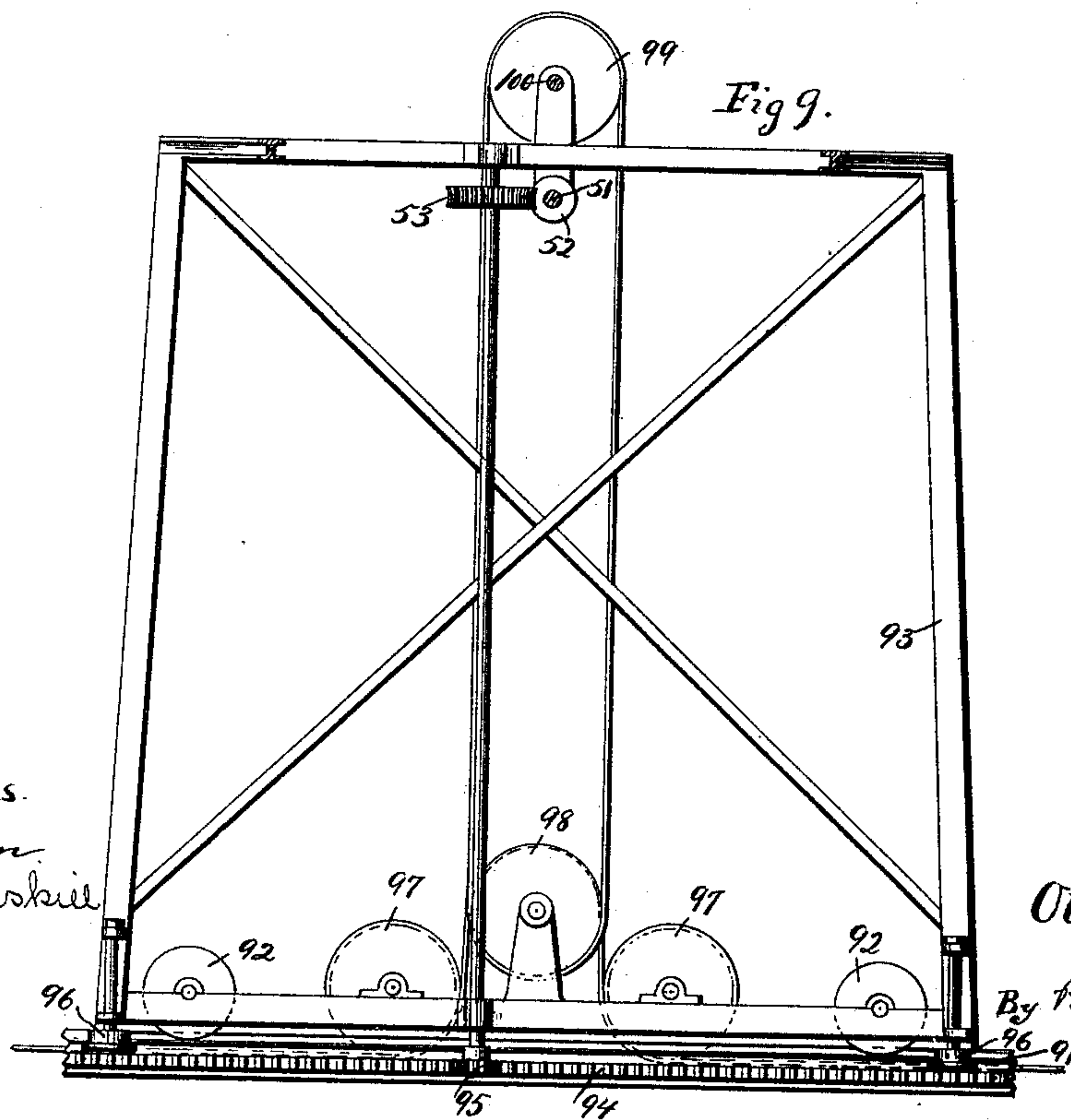
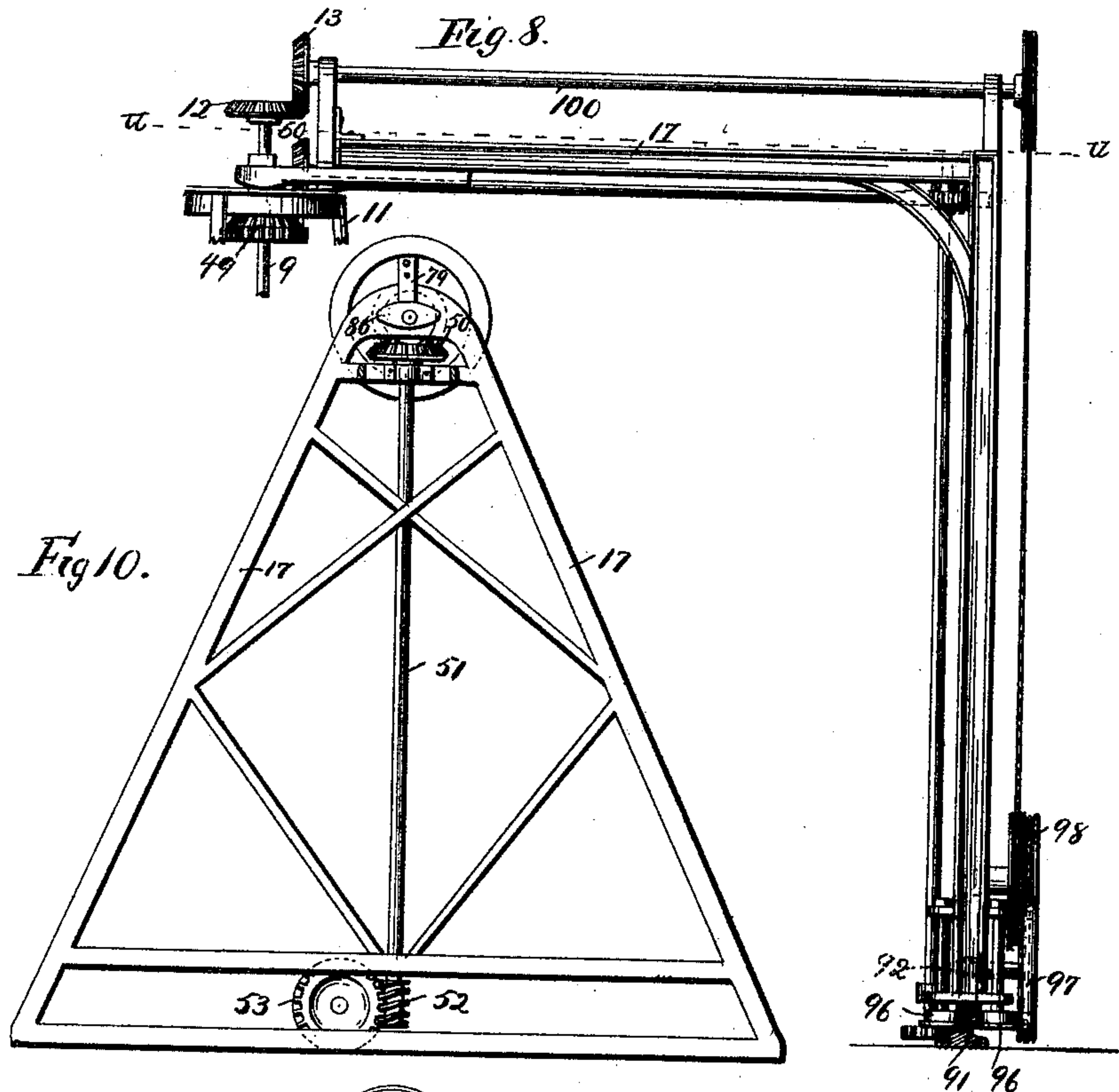
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O. HOLM.
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Patented Nov. 5, 1889.



Witnesses.

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UNITED STATES PATENT OFFICE.

OLOF HOLM, OF MINNEAPOLIS, MINNESOTA.

TRAVELING DERRICK.

SPECIFICATION forming part of Letters Patent No. 414,218, dated November 5, 1889.

Application filed May 6, 1889. Serial No. 309,690. (No model.)

To all whom it may concern:

Be it known that I, OLOF HOLM, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Traveling Derricks, of which the following is a specification.

My invention relates to that class of derricks operated, preferably, by constantly-running power, and adapted to the lifting and transferring from place to place of machinery or other heavy articles, while themselves capable of being moved to and fro on their supports; and it consists, generally, in the construction and combination hereinafter described, and particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of my improved power-derrick. Fig. 2 is a plan view of the same. Fig. 3 is a horizontal section on the line *yy* of Fig. 1. Fig. 4 is a similar section on the line *xx* of Fig. 1. Fig. 5 is a similar section on line *zz* of Fig. 1. Fig. 6 is a front elevation of the driving belt or rope and its wheels or drums. Fig. 7 is a side elevation of a modified form of derrick arranged to be operated by hand-power. Fig. 8 is a side elevation of a traveling supporting-frame for a derrick arranged to be driven by power from beneath. Fig. 9 is a front elevation of the same. Fig. 10 is a horizontal section of the top of the frame on the line *uu* of Fig. 8. Figs. 11, 12, 13, 14, 15, 16, and 17 are details. Fig. 18 is a detail of a portion of the frame 17.

In the drawings, 2 represents the wall of the building or other suitable fixed support to which the derrick is secured, and by which it is stayed; 3, a suitable rail or track arranged to support the derrick, and along which it is arranged to travel upon the grooved wheel 4, which rolls upon the top of the rail 3 and turns in suitable bearings in the frame 5 of the circular geared base 6. Pivoted upon said base, and concentric therewith, is the preferably circular plate 7 of the derrick, supported upon the anti-friction rolls 8, which are suitably journaled in or upon said base.

Centrally arranged in suitable bearings upon the plate 7 is the main vertical shaft 9, which is journaled in the top 10 of the derrick-frame 11, and is driven, preferably,

through the medium of the bevel-gears 12 and 13 by means of the horizontal shaft 14, which is in turn rotated by means of the rope or belt 15, driven by the drum or drive wheel 16, having suitable connection with a continuously-running power. The frame 11 is stayed by means of the angular frame 17, which has pivotal connection with the top of the derrick-frame, the pivot-hole being shown in detail, Fig. 18, and traveling support and connection with the wall 2, and which also serves as a support for the shaft 14 and its attachments. I prefer to make this traveling connection in the following manner: A suitable beam 18 is strongly secured horizontally to the wall 2. Embedded in and firmly secured to this beam is the flanged rail 19, extending longitudinally of said beam on its upper surface. Suitable wheels or rolls 20, journaled in the extremity of each of the members of the frame 17, rest their periphery against the inner surface of the flange 21 and hold the frame 17 firmly in place, the opposite flange 23 being close to but not in contact with them. Other rolls 22, journaled in said frame, rest upon the top of the flange 23, and rolls 24 rest against the under surface of the stop 25, whereby lateral downward and upward movement of the frame is prevented, while at the same time said rolls permit and assist its free movement longitudinally of the rail 19 as the derrick is moved along the rail 3, as hereinafter described.

By means of suitable gear attachments to the constantly-running shaft 9 the derrick may be moved to and fro along its supporting-rail 3, and also rotated about said shaft as an axis, so as to swing the crane 36 in either direction, and the drum or windlass 37 may also be rotated in either direction to raise or lower the lifting-chain 38. For these purposes I prefer to arrange upon the main shaft 9 loose gears which mesh into other gears fixed to secondary shafts, which secondary shafts are provided with or connected to suitable worm-gearing, by which the requisite movements are imparted. Suitable friction-clutches are arranged upon the main shaft and adapted to engage the loose gears and impart to them the movement of the shaft.

For the purpose of moving the derrick

along its supporting-rail in one direction the clutch 39, by means of the lever 40, is brought into contact and frictional engagement with the gear 30, causing it to rotate with the shaft 9 and to turn the shaft 35 by means of the gear 32, fixed on said shaft. This shaft then, by means of the spur-gears 41 and 42 and the bevel-gears 43 and 44, turns the worm-shaft 45. This worm meshes with the worm-wheel 46, which is rigidly secured to the shaft 47, carrying the pinion 28. The pinion 28 engages the rack 26 on the rail 3 and propels the derrick upon its carrying-wheel 4. The shaft 35 also, by means of its gear 48, engages and turns the loose spur and bevel gear 49, which engages with and rotates the bevel-gear 50, rigidly secured to the shaft 51. This shaft is provided with the worm 52, meshing into the worm-wheel 53, rigidly secured to the shaft 54, which carries the pinion 29. This pinion 29 engages with the rack 27, so as to carry the frame 17 forward with the derrick. To propel the derrick in the opposite direction, the clutch 39 is thrown up by its lever, so as to engage the loose gear 31. This meshes into the idler-gear 33, journaled in suitable bearings, which in turn meshes into the gear 34, fixed to the shaft 35, whereby the shaft is rotated in an opposite direction from that above described, and by means of the connecting-gear above described carries the derrick also in an opposite direction from that described.

To swing the crane 36, the clutch 55, by means of its lever 56, is brought into engagement with one of the loose bevel-gears 57 or 58, according to the direction in which it is desired to swing the crane. The bevel-gear thus clutched meshes into the bevel-gear 64, fixed on the worm-carrying shaft 59, which worm engages the worm-wheel 60, mounted on the shaft 61. The pinion 62, also mounted on the shaft 61, meshes into the circular rack 63 of the base 6, and, traveling around it, causes the derrick to rotate and swing the crane. By clutching the other bevel-gear 57 or 58 an opposite motion is given to the bevel-gear 64, and consequently to the derrick.

To raise or lower the lifting-chain 38 when the derrick is placed in position, the clutch 65 is operated, preferably, by means of a bell-crank lever 66 and a screw-carrying hand-wheel 67, secured to the arm of the lever to engage one of the loose gears 68 or 69. If the gear 68 is engaged, it meshes into and rotates the gear 70, rigidly secured to the worm-carrying shaft 71. The worm in turn meshes into and rotates the worm-wheel 72, rigidly secured to the drum or windlass 37, thus winding or unwinding the chain 38, secured to it. To give an opposite motion to the drum 37 the clutch is thrown into engagement with the gear 69, which meshes into the idler-gear 73, suitably journaled in the derrick-frame, and in turn meshes into the gear 74, rigidly secured to the shaft 71, whereby the shaft and

also the drum 37 are rotated in the opposite direction from that in which they are rotated by the gear 70.

In order to hold the plate 7 in position concentric with the base 6 and resting upon the rolls 8, the base is preferably provided with the circular hub or shoulder 75, projecting upward from the center of its upper surface, the plate 7 having a circular central opening of the size of the hub, around which it turns as an axis. Suitable rolls 76, journaled in said hub, ride upon the upper surface of the plate 7, and, while allowing it to rotate freely, hold it firmly in position. I also prefer to provide the ears or lugs 77 and 78, secured to the derrick-frame and extending underneath the loose gears 31 and 69, to support them when not engaged by their respective clutches. A similar ear or lug 79, secured to the plate 80, around which plate the annular top of the derrick rotates, projects over and holds down the frame 17, so as to keep the bevel-gears 12 and 13 and 49 and 50, respectively, in engagement with each other.

Suitable bearings and supports are provided for the various shafts, gears, and drums, as shown. The crane 36 is preferably provided with suitable sheaves 81 and 82, journaled in its horizontal beam to carry the lifting-chain from the drum, and a suitable brace 83 is secured to the plate 7 and the horizontal beam of the crane 36 near its outer extremity. The frame 17 is secured to the plate 80, preferably, by the elliptical spur 86, which fits into a suitable opening in the frame, and thus prevents its turning therein. Suitable bearing-carrying frames 87 and 88, secured to the frame 17, support the shaft 51 and its attachments and the pulleys or drums 89 and 90. The distance between the driving wheel or drum 16 and the drum or wheel 91 is arranged to allow for the "travel" of the frame 17 and the idlers 89 and 90 between them with movement to and fro of the derrick, as above described.

Any suitable means may be employed for adjusting the tension of the driving belt or rope 15 to prevent slipping upon its drums or wheels.

In Figs. 8, 9, and 10 are shown a modified construction for use on platforms, docks, decks of vessels, and other places where there is no permanent wall or similar support, or where the power is preferably furnished from beneath. A suitable rail 91 is secured to the floor parallel with the derrick-rail, upon which are supported and travel the wheels 92, which carry the upright frame 93 and its attachments. The rail 91 is provided with a suitable rack 94, engaged by the pinion 95. Suitable flanged wheels 96 engage the ball of the rail 91 and prevent the frame 93 from being lifted or thrown from the rail. Power is transmitted by means of the drums or wheels 97, 98, and 99 to the shaft 100, the operation

of the derrick and its attachments being the same as above described in reference to the form.

Fig. 7 represents another modified construction of hand-power derrick having similar supports, connections, and means for running the derrick to and fro, and also for swinging the crane, except that the power is applied by hand and not through a constantly-rotating shaft driven by outside power. The main shaft 101, supported in suitable bearings centrally and vertically in the derrick-frame, is provided with the fixed bevel-gears 102 and 103, meshing into other bevel-gears 104 and 105, by means of which the pinions engaging the racks on the supporting-rails are turned to carry the derrick to and fro, as above described. The shaft is also provided with a slidable bevel-gear 106, the position of which is controlled by a suitable pivoted lever 107, having suitable connection with it, as by a collar lying loosely in a groove in the hub of the gear linked to the lever. A suitable drive-wheel 108, carrying an endless band rope or chain 109, is journaled to the derrick-frame, its shaft carrying the bevel-gear 110. By means of the lever 107 the bevel 106 may be thrown into engagement with the bevel-gear 110, the lever engaging a suitable toothed rack 111 on the derrick and holding the gears in engagement with each other. By means of the band-rope the wheel 108 may be rotated in either direction, and thus through the gearing and shafting described cause the derrick to travel in either direction. The derrick is rotated by means of the crank 112, operating the worm-gearing 113, which in turn through its shaft 114 causes the pinion 115 to travel around in the circular rack 116 of the base. The lifting-chain is operated by the windlass 117 in the ordinary manner.

If desired, a suitable jacket may be secured around the frame of the derrick, so as to inclose and protect all of the machinery of the derrick.

I claim as my invention—

1. A derrick having a suitable base supported and adapted to be moved longitudinally of a supporting rail or track, a crane-carrying frame pivotally supported upon said base and having traveling support for its top adapted to be moved in a parallel direction to that of the base, and means for propelling said derrick to and fro on its support and for rotating it upon its base, combined and adapted to be operated substantially as described.

2. In a derrick, the combination, with carrying and guiding fixed rails along which said derrick is adapted to travel, of racks rigidly secured to said rails, a continuously-running vertical shaft arranged in said derrick, loose gears arranged upon said shaft, connected, respectively, by suitable mechanism with said racks, with a windlass upon said derrick, and with the base of the derrick, and clutches

slidably adjustable upon said shaft, and adapted, respectively, to engage said gears, and thereby to propel said derrick to and fro, or to rotate the same upon its base, or to operate said windlass, substantially as described.

3. In a device of the class described, the combination, with a circular base having a geared periphery supported upon a wheel adapted to run upon a fixed rail provided with a rack, of a crane-carrying frame pivotally supported upon said base, and also pivotally connected at its top to a horizontal frame secured to and adapted to be moved along a fixed support provided with a rack and parallel with said rail, a continuously-rotating main vertical shaft supported in said frame and provided with loose gears meshing into similar gears fixed on secondary shafts, said secondary shafts being connected, respectively, by means of other shafts and gears with pinions engaging said racks and the peripheral gearing of the base and with the windlass of the derrick, and clutches arranged on said main shaft and adapted to engage said loose gears, whereby power may be transmitted through said secondary shafts and their connections, so as to propel said derrick forward or back on its support, or to rotate the same in either direction upon its base, or to rotate the windlass in either direction, substantially as and for the purpose specified.

4. The combination, with a derrick, of a fixed supporting-rail adapted to carry the derrick, and a guide-rail with which the top of the derrick has traveling connection, mechanism, substantially as described, engaging said rails and adapted to move said derrick along the same, a continuously-running vertical shaft carrying loose gears connected with said mechanism, and clutches arranged upon said shaft and adapted to engage said gears, and thus to transmit motion to said mechanism and to propel the derrick, substantially as described.

5. The combination, with the derrick, of the supporting-rail 3, having the rack 26, the rail 19, having the rack 27 and arranged parallel with the rail 3 and furnishing support for the top of the derrick by means of traveling connections, the pinions 28 and 29, respectively arranged to mesh into said racks, the main shaft 9, arranged to rotate in bearings in the derrick-frame, and gear and shaft connections between said shaft and said pinions, by means of which said pinions are rotated by said shaft and the derrick propelled along said rails, substantially as described.

In testimony whereof I hereunto set my hand this 29th day of April, 1889.

OLOF HOLM.

In presence of—

A. C. PAUL,
BESSIE BOOTH.