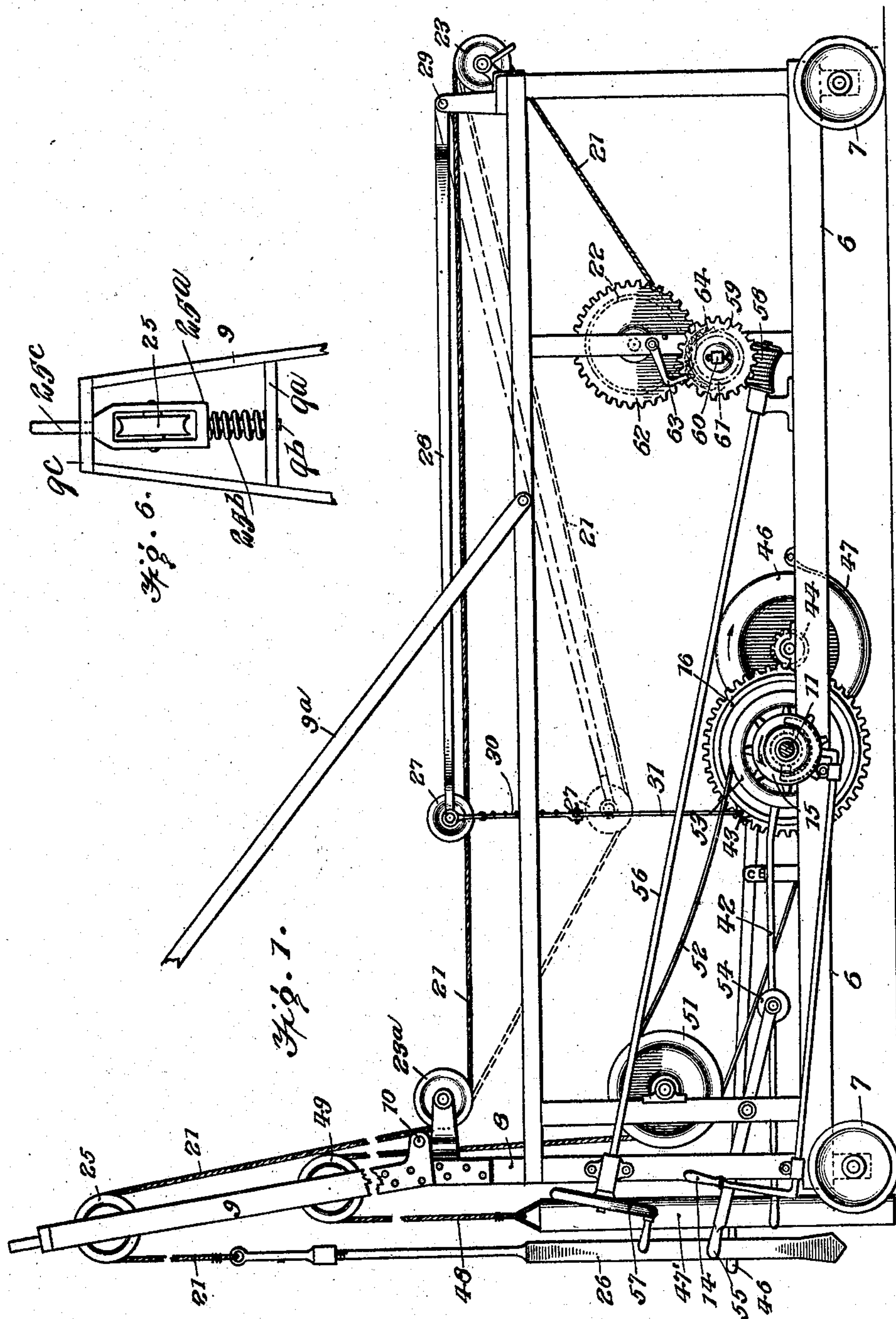


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APPLICATION FILED APR. 13, 1908.

Patented Oct. 13, 1908.
2 SHEETS—SHEET 1.



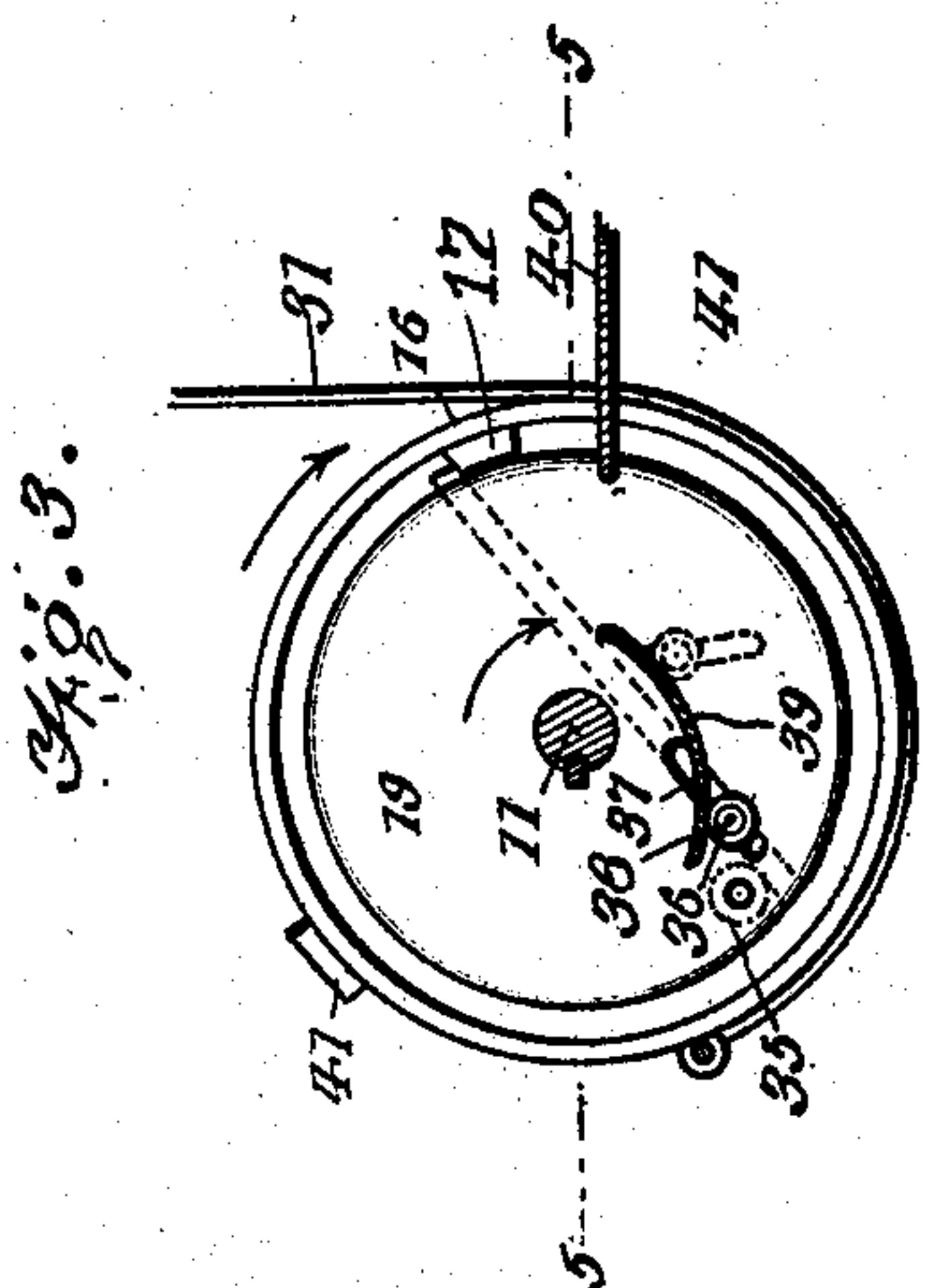
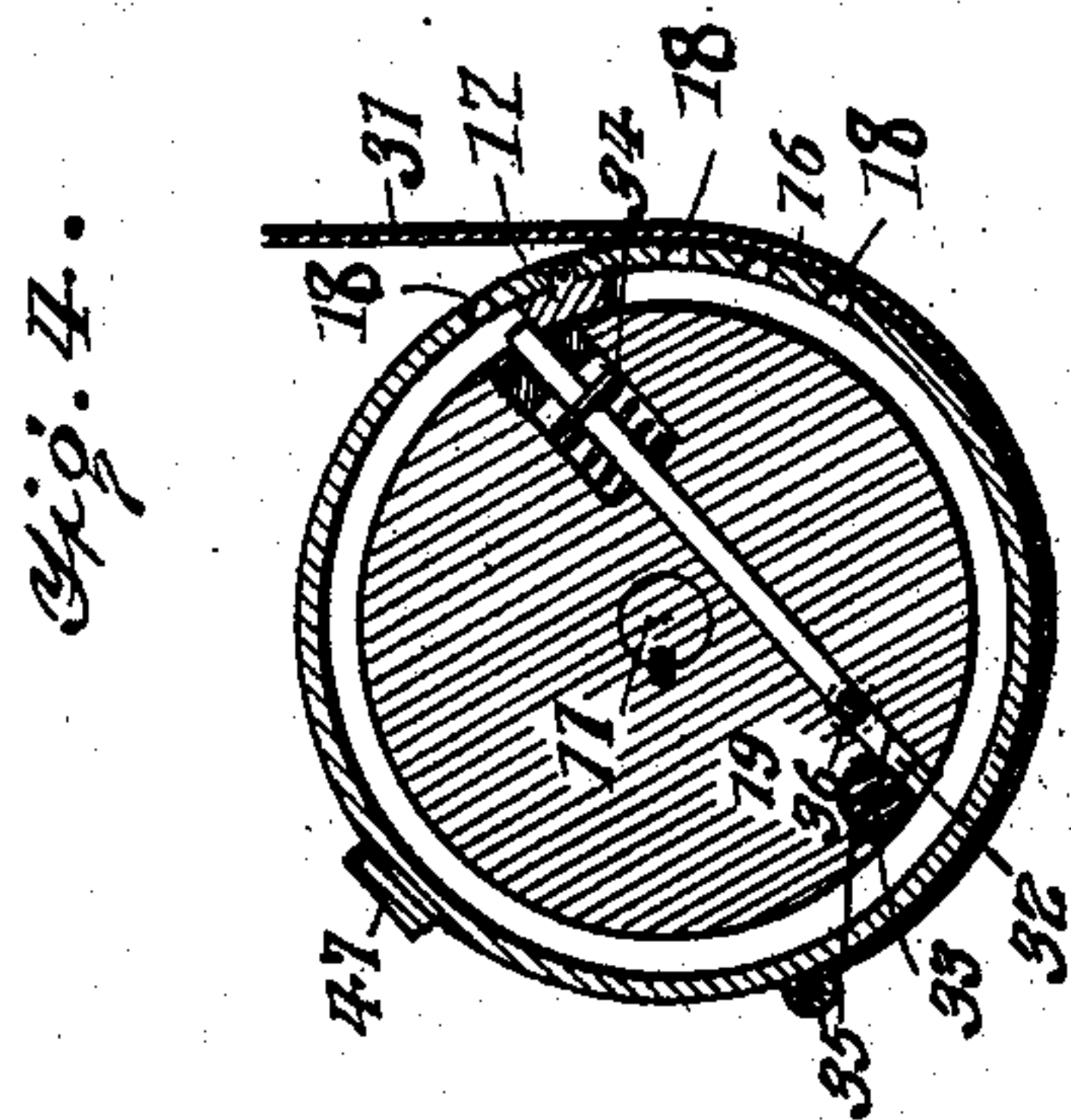
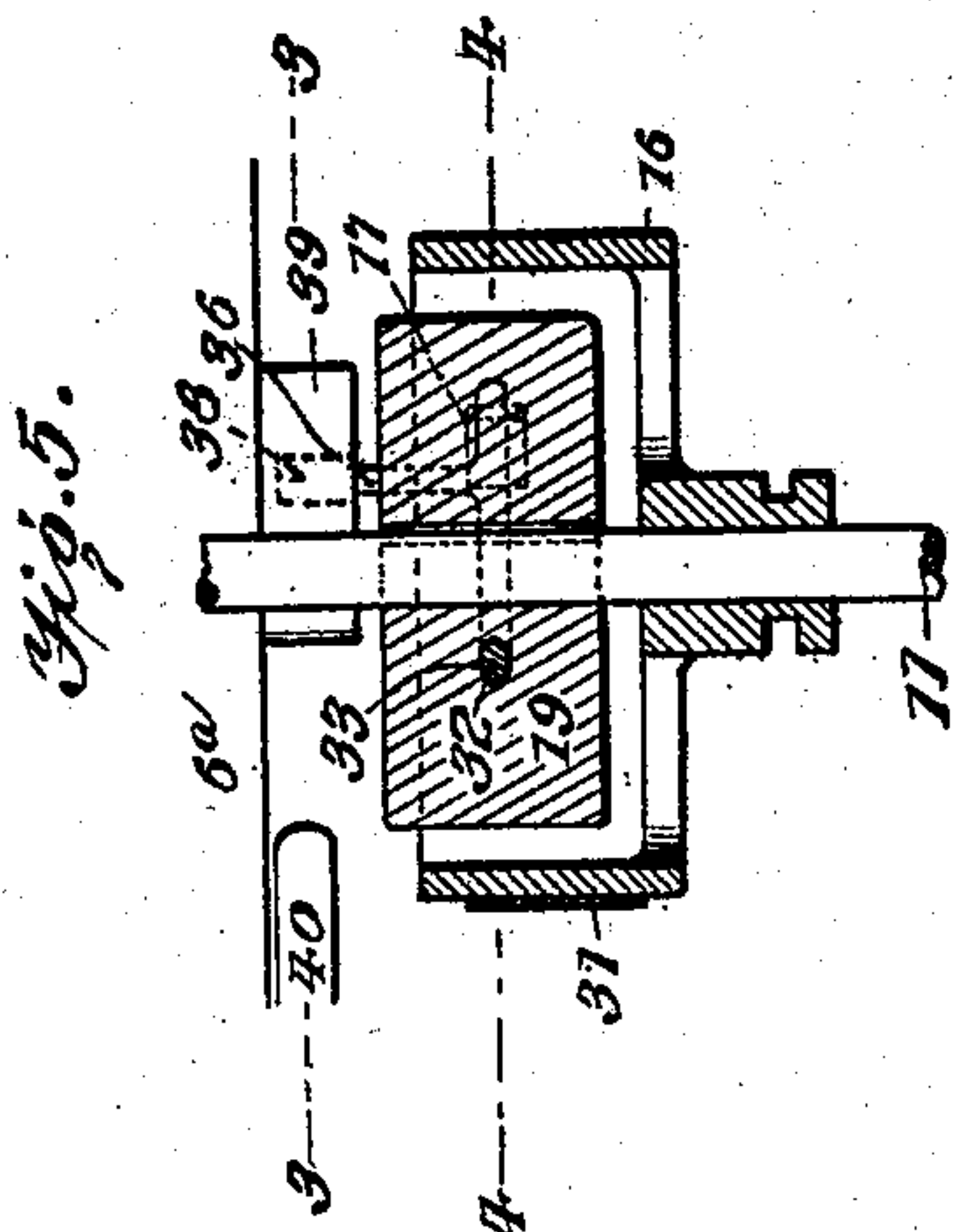
WITNESSES
L. H. Schmidt.
J. E. Barry

INVENTOR
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ATTORNEYS.

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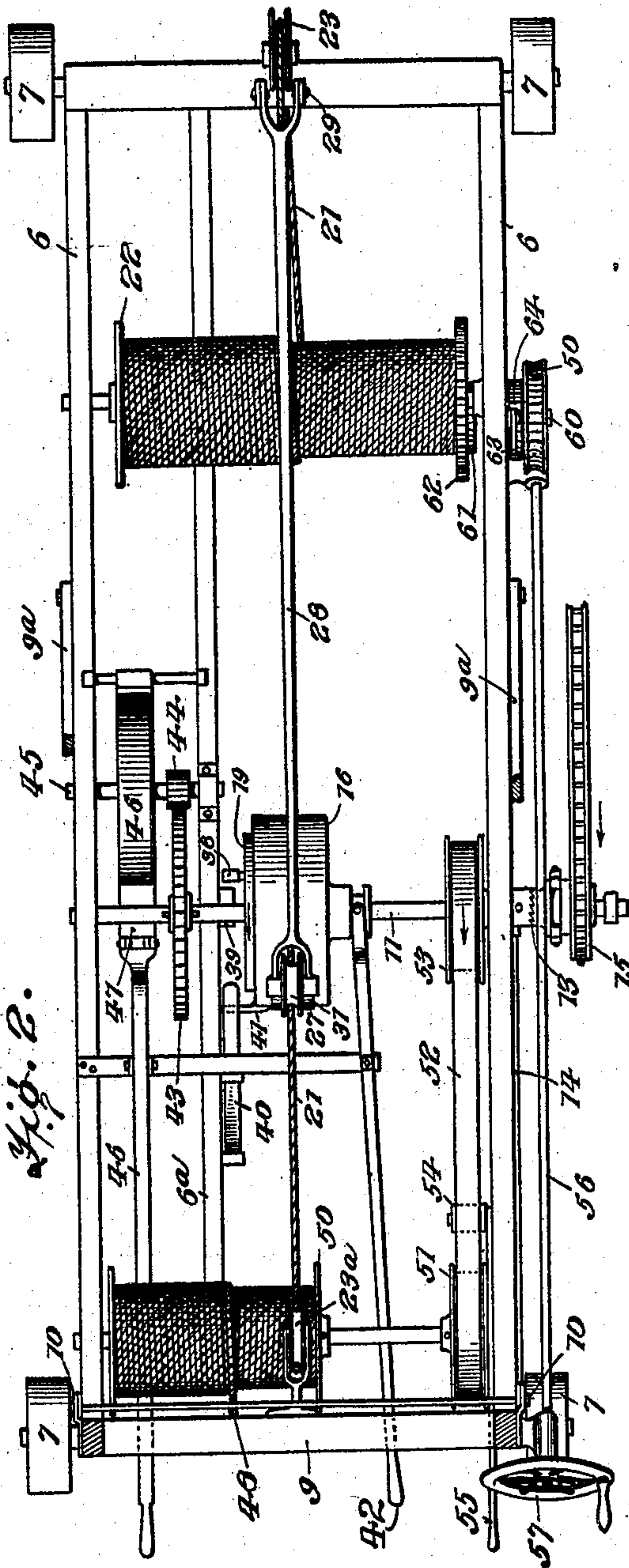
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UNITED STATES PATENT OFFICE.

RICHARD DAVIS MOON, OF SAN ANGELO, TEXAS.

WELL-DRILLING APPARATUS.

No. 901,182.

Specification of Letters Patent.

Patented Oct. 13, 1908.

Application filed April 13, 1908. Serial No. 426,834.

To all whom it may concern:

Be it known that I, RICHARD DAVIS MOON, a citizen of the United States, and a resident of San Angelo, in the county of Tom Green and State of Texas, have invented a new and useful Improvement in Well-Drilling Apparatus, of which the following is a specification.

This invention relates to certain improvements in well drilling apparatus and has for its object to produce improved means for lifting the drill and permitting a quick and unimpeded drop of the drill bar. The use of a high or top heavy rigging or frame is avoided, and a simple and light apparatus is provided which avoids the great jar and noise found in the use of ordinary drill rigs, and which will do the same work with less power than an ordinary apparatus. The cheapness and lightness of the rig are important features, and its tower or standard can be folded so that the whole apparatus can be readily hauled or transported from place to place without unshipping any part thereof.

The invention is illustrated in the accompanying drawings, in which

Figure 1 is a side elevation of the apparatus. Fig. 2 is a top plan view thereof. Fig. 3 is a detail side view of the lifting clutch. Fig. 4 is a vertical section of the same, and Fig. 5 is a section on the line 5—5 of Fig. 3. Fig. 6 is a detail front view of the pulley and its frame at the top of the standard.

Referring specifically to the drawings, 6 indicates the rigging frame mounted on wheels 7 for convenience of transportation. At the front end it has uprights 8 to the top of which the folding standard 9 is hinged as at 10, to fold back upon or over the frame when desired. Any suitable fastening or device may be used to hold the standard erect while in use. Preferably braces 9^a are used, which are bolted at their ends to the standard and frame and can be removed by taking out the bolts.

Mounted upon bearing blocks at or about the middle of the lower sills of the frame is a shaft 11 which has suitable driving means such as a sprocket 15 to which power may be applied by a chain belt from any suitable

motor. The sprocket 15 is loose on the shaft 11 and is thrown in or out of gear with a clutch 13 on the shaft, by means of a lever 14 the handle of which is at the front of the frame, for convenient operation.

16 indicates a pulley loose upon the shaft 11 and free to turn thereon. This pulley has a projecting block or clutch member 17 on the inside of the rim thereof, and to vary the throw the block is capable of adjustment to any one of the holes 18 in the rim of the pulley. 19 is a clutch or driving member fast upon the shaft 11 and located beside the hub of the pulley and provided with means to engage or strike the block or projection 17 on the inside of the rim of said pulley, as more fully described hereinafter.

The drill rope 21 extends from a feed drum or spool 22 at the rear of the machine, over a guide pulley 23 at the rear, and a guide pulley 23^a at the front, near the foot of the upright, thence over a pulley 25 at the top of the standard, and to connection with the drill rod 26. A cross bar 9^a is arranged below the pulley 25, and a rod 9^b extends upward from a sliding connection with the cross bar to a connection with the hanger 25^a of the pulley 25, and a spiral spring 25^b is arranged between the hanger and the cross bar. The hanger 25^b is provided with a projecting pin 25^c, which slides through the top cross bar 9^c of the folding standards 9.

Between the pulleys 23 and 23^a the drill rope passes under a pulley 27 which is carried at the end of a long arm 28 hinged at its rear end, as at 29, to the rear upper cross bar of the frame. The frame of the pulley 27 is connected by a chain 30 to one end of a strap 31 which is attached at its other end to the rim of the pulley 16, and when said pulley is actuated by the operation of the clutch the drill rope is pulled down toward said pulley which hoists the drill, and when the clutch is released the pulley turns back freely, allowing the drill to drop and producing the stroke.

The clutch member or drum 19, which is fast on the shaft 11 and which revolves within the rim of the pulley 16, carries a bar 32 which is movable lengthwise in a radial groove or recess 33 in the drum and which is normally projected at its end be-

yond the periphery of the drum to engage the block 17 on the rim of the pulley 16. The coiled spring 34 normally advances said bar, and it backs against a roller 35 in the drum adjacent said groove to permit of its easy operation. The bar has a laterally extending arm 36 which projects through a slot 37 in the side of the drum opposite the groove, and this arm has on its projecting or exposed end a roller 38 adapted to engage under a cam 39 fastened to the side of the middle sill 6^a of the frame; and when it engages the cam the bar is retracted, disengaging its outer end from the block 17 and allowing the pulley 16 to slip and turn back, permitting the drop of the drill rod. A spring 40, fixed to the sill 6^a receives the stroke of a projection 41 on the rim of the pulley 16 and stops its backward movement without jar or great shock.

The pulley 16 may be shifted by the lever 42, to cause the clutch to miss and thus stop the drill without stopping the drive shaft 11. This shaft also carries a spur gear 43 meshing with a pinion 44 whose shaft 45 carries a fly wheel 46, and a band brake 47 extends partly around the fly wheel and may be operated by a lever 46 connected to one end thereof, for an obvious purpose.

The bailer or slush bucket 47' is attached to a rope 48 which extends over a pulley 49 on the tower and is wound around a drum 50 journaled on the frame at the foot of the tower. The shaft of the drum has a pulley 51 connected by belt 52 to the pulley 53 on shaft 11. Ordinarily the belt is loose, but it may be tightened to start the drum by an idler 54 carried at the end of a lever 55.

The feed drum or spool 22 of the drill rope is operated by means of a shaft 56 at the side of the frame, having a hand wheel 57 at its front end and a worm 58 at its rear end meshing with a gear 59 on shaft 60 which has a pinion 61 meshing with spur gear 62 on the drum shaft. A pawl 63 engages a ratchet 64 on shaft 60 and prevents back slip.

The operating levers and devices are all conveniently located at the front of the rig and can be operated by one man if necessary. The clutch devices for operating the drill rope are automatic in operation and give a powerful leverage requiring small motive power for the operation of the apparatus.

I claim—

1. In a drilling apparatus, the combination with the drill rope, of a shaft and means to drive the same, a pulley loose on the shaft, a strap connected at one end thereto a swinging pulley at the other end of the strap arranged to engage the rope and take up the same, a clutch device on the shaft engage-

able with the loose pulley to take up the rope, and means to release the clutch, the loose pulley being free to turn back after the clutch is released.

2. In a drilling apparatus, the combination with the drill rope, of a shaft and means to drive the same, a pulley loose on the shaft, a strap connected thereto, a swinging pulley connected to the strap and under which the rope passes to pull the rope when the first named pulley is revolved, the loose pulley having a projection, a clutch fast on the shaft beside the crank and having a movable member arranged to strike the projection when advanced and turn the first named pulley and take up the rope, and means to advance and retract said member, the first named pulley being free to turn back and slack the rope after release of the clutch.

3. In a well drilling apparatus, the combination of a frame, a rope drum at the rear end thereof and guide pulley at the front end thereof, with a drill rope extending between the same, a shaft located on the frame between said drum and pulley and having driving means, a pulley loose on the shaft, a strap connected therewith, a swinging pulley connected with the same and engaged with the rope, and a clutch device on the shaft, automatically engageable and disengageable with the loose pulley to alternately take up and let off the rope.

4. In a well drilling apparatus, the combination of a frame, a rope drum at the rear end thereof, a guide pulley at the front end thereof, a drill rope extending between the same, a vertically swinging arm hinged to the frame and having a pulley at the free end thereof resting upon the rope, and means to intermittently pull down the pulley and arm to alternately take up and let off the rope said means comprising a strap connected with the pulley, a shaft, a pulley loose on the shaft and connected with the strap, and means for connecting and disconnecting said pulley and the shaft.

5. In a well drilling apparatus, a take up mechanism for the rope comprising in combination a shaft, a pulley loose thereon and having an inward projection on the rim, a clutch drum fast on the shaft, a yielding bar carried by the drum and slidable radially therein and normally projecting at its outer end beyond the periphery of the drum, in position to engage the projection and turn the pulley, a stationary cam located beside the drum and engageable with the bar to retract the same, and connections between the pulley and drill rope to take up the latter.

6. In a well drilling apparatus, a take up mechanism for the rope, comprising in combination a shaft, a shiftable pulley loose

thereon, a clutch fast on the shaft and engageable with the pulley to turn the same, connections between the pulley and the drill rope, adapted to take up the latter when the
5 clutch is engaged, means to automatically disengage the clutch after each engagement thereof with the pulley, and means to shift

the pulley on the shaft to prevent engagement thereof by the clutch.

RICHARD DAVIS MOON.

Witnesses:

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W. B. HUNTER.