

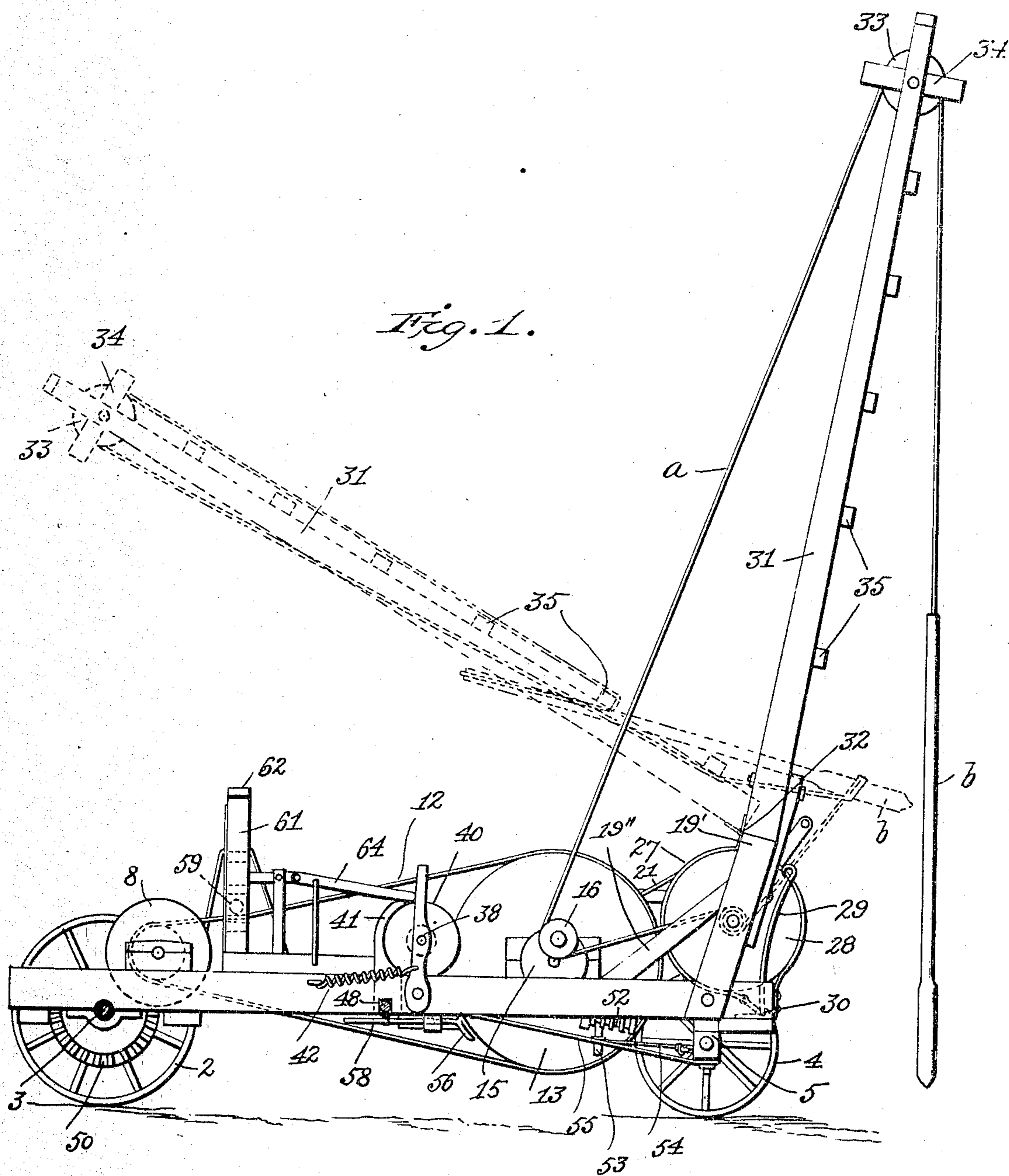
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PATENTED NOV. 19, 1907.

W. H. ULLMAN & M. OKEY.  
WELL DRILLING APPARATUS.

APPLICATION FILED APR. 13, 1907.

3 SHEETS—SHEET 1.



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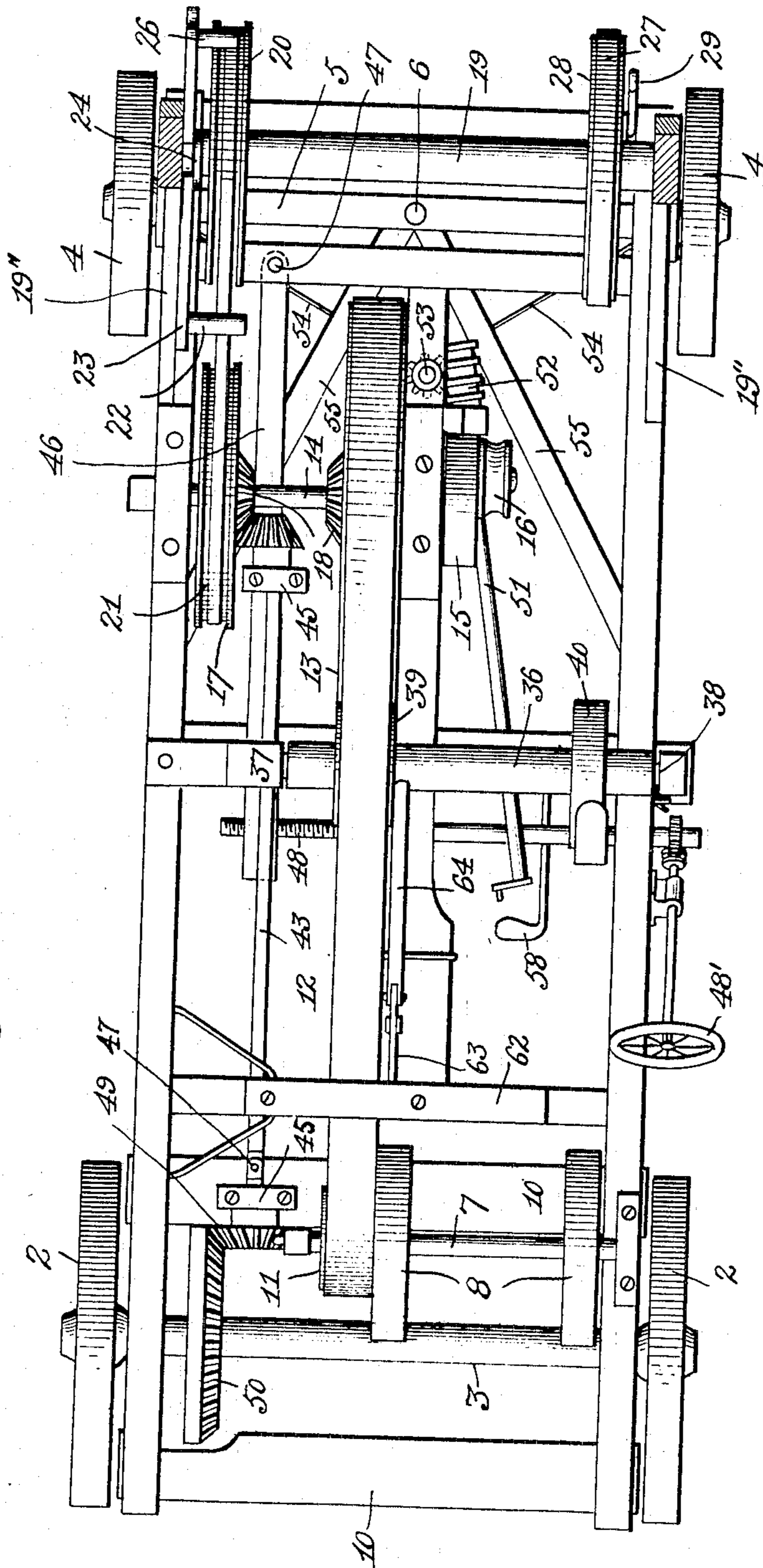
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

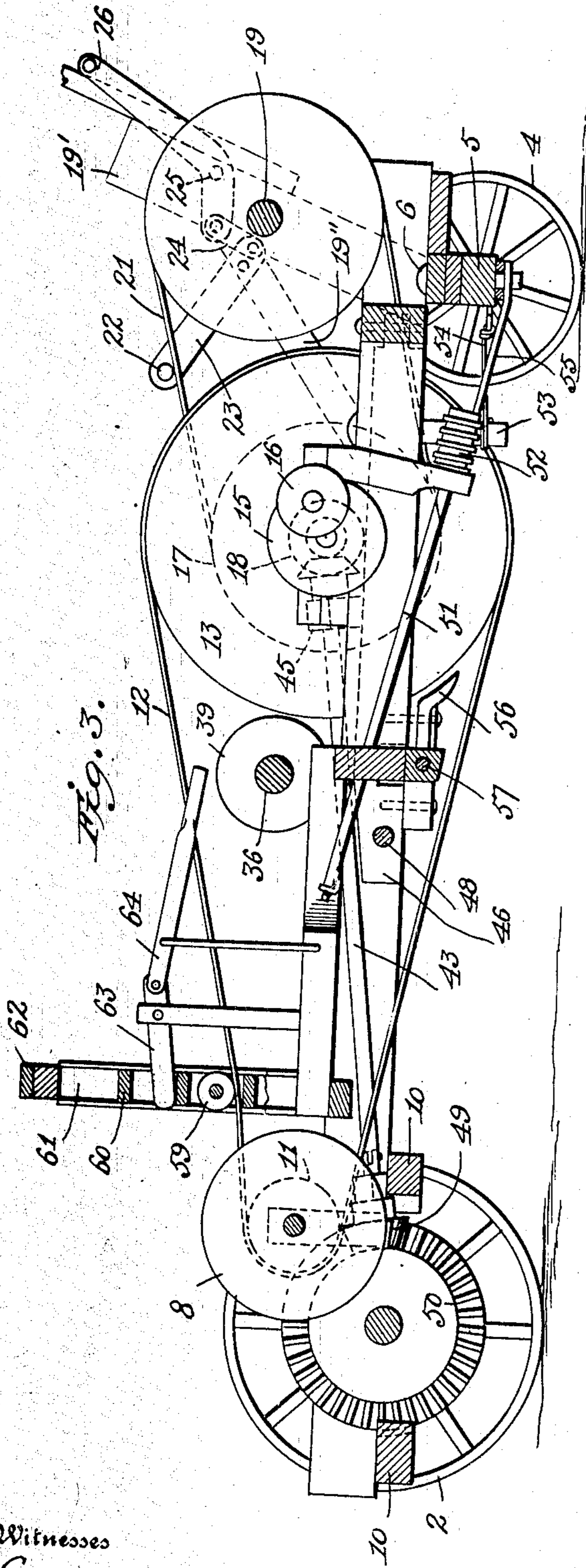


Fig. 3.

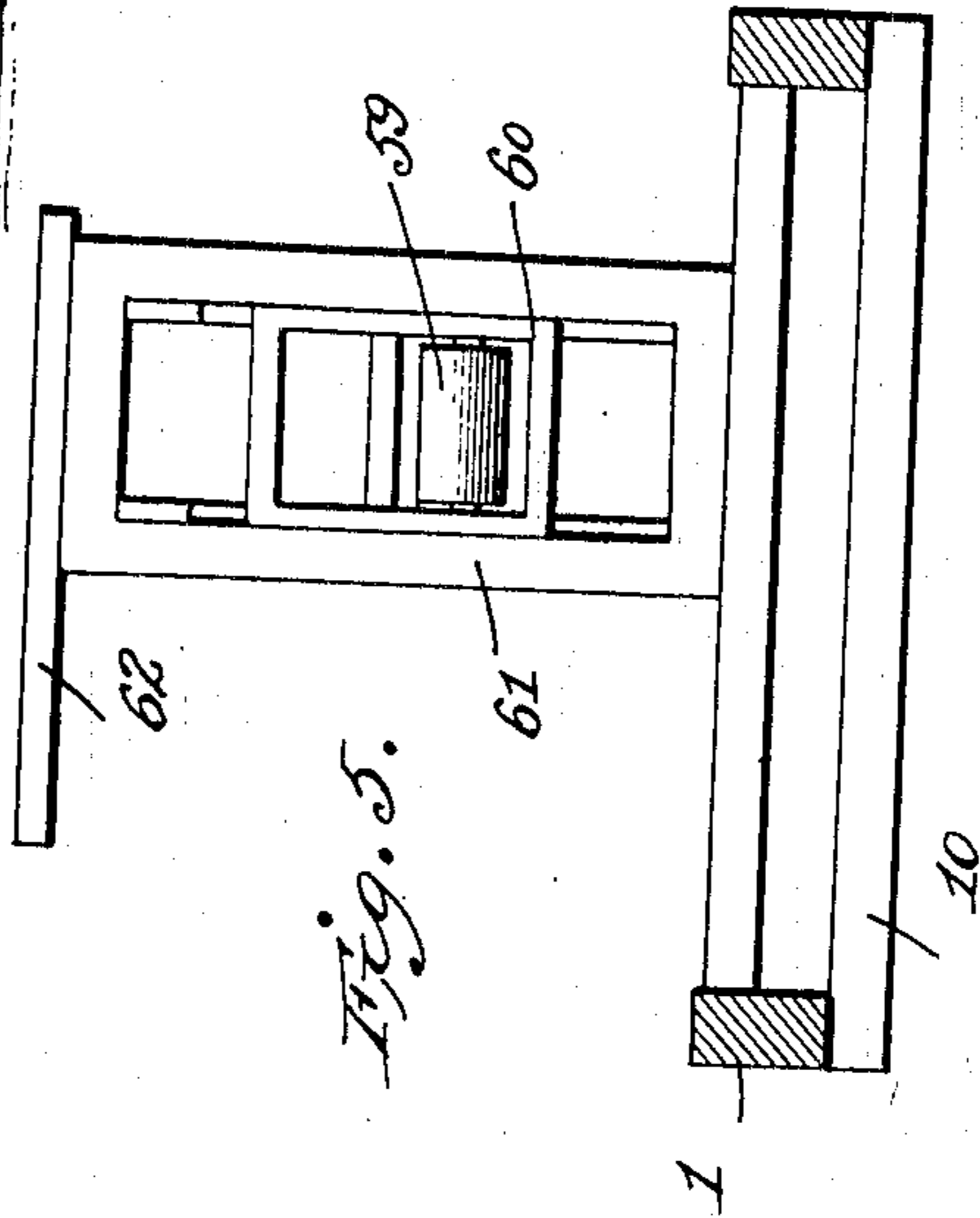


Fig. 5.

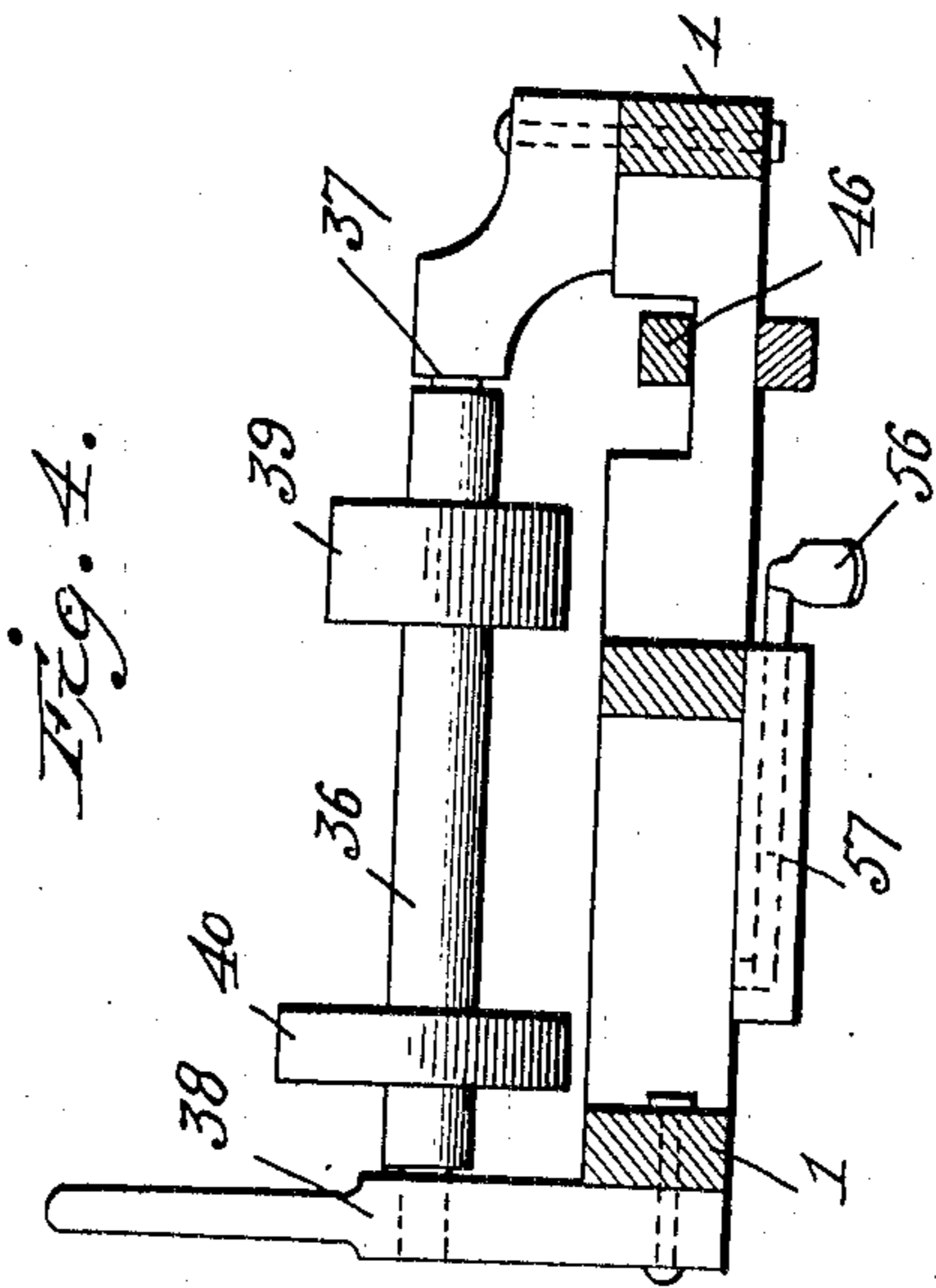


Fig. 4.

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# UNITED STATES PATENT OFFICE

WILLIAM H. ULLMAN, OF STAFFORD, AND MILES OKEY, OF ZANESVILLE, OHIO.

## WELL-DRILLING APPARATUS.

No. 871,248.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed April 13, 1907. Serial No. 368,109.

*To all whom it may concern:*

Be it known that we, WILLIAM H. ULLMAN and MILES OKEY, citizens of the United States, residing, respectively, at Stafford, in the county of Monroe and State of Ohio, and Zanesville, in the county of Muskingum and State of Ohio, have invented certain new and useful Improvements in Well-Drilling Apparatus, of which the following is a specification.

Our invention relates to apparatus for drilling wells and particularly to a form of such apparatus especially designed for use where gas or gasoline engines are employed as a source of motor power.

One object of our invention is to provide such a form of apparatus as will admit of running the bull-wheels either way in raising or lowering the tools without the aid of cog wheels while the engine moves ahead at full speed.

A further object is to provide means whereby the propelling power may be connected to move the supporting truck either backward or forward at option while the engine moves ahead continuously.

The advantages of the above features will be readily apparent in connection with a gas engine as a source of power since it is well known that such engines are most efficient when running continuously in one direction, and can with difficulty be reversed.

A still further object of our invention is to so dispose the bull wheels in legs on the front end of the portable machine that a direct vertical pull will be obtained and liability of the rear end of the truck to lift will be avoided.

Further objects relate to combinations including novel forms of belt tighteners, and a compact and convenient arrangement of parts whereby the operation thereof is facilitated.

Our invention will be more readily understood from the following description and its scope outlined in the appended claims.

Referring to the accompanying drawings wherein the same parts are designated by like reference characters, Figure 1 is a side elevation, a convenient means for lifting the derrick being illustrated in dotted lines; Fig. 2 is a plan view, the derrick being omitted to better illustrate the parts underneath; Fig. 3 is a vertical section through the apparatus; Fig. 4 is a detail view illustrating the manner

of mounting the sand reel and Fig. 5 is a detail view illustrating the frame for mounting one of the belt tighteners.

1 is the frame of a truck having rear wheels 2, 2 fixed to an axle 3, journaled in said frame and front wheels 4, 4 on an axle 5, the latter being pivoted at 6, centrally at the front end of the truck. A driving shaft 7 is suitably journaled in bearings at the rear of the machine. Said shaft carries fly wheels 8, 8 to be driven by any suitable gas or oil engine (not shown). The engine may be mounted upon the rear end of the truck which is provided with stout cross beams 10 to constitute an engine base. The shaft 7 is provided with a belt pulley 11, adapted to receive a main driving belt 12. Said belt drives a large main belt wheel 13 fixed upon a shaft 14 and from this shaft is taken power; first to raise the drill for its reciprocations in drilling by means of the crank wheel 15 with antifriction disk 16 on the crank pin thereof the arrangement being such that the lift of the drill is four times the arm of the crank wheel; second to drive the bull wheels by means of belt pulley 17 thereon, and third to propel the truck either forward or backward at option by means of the gear pinions 18 fixed thereon.

The bull wheel shaft 19 is securely mounted in stout legs 19' which extend upward and somewhat forward from the front end of the truck and said legs are braced by suitable stays 19''. One of the bull wheels is formed to receive the driving belt 21 and hence receive power from belt wheel and shaft 14 as shown. 22 is a tightening roll which is adapted to be pressed upon belt 21 from above at option to make the same effective for driving, by means of a lever 23 suitably pivoted to a brace 19'' as shown. A link 24 connects the other end of lever 23 to an operating handle 26 pivoted at 25 to a leg 19'. It will be understood that the belt 21 is loose enough on belt wheels 17 and 20 so as to normally slip thereon and only transmits a driving impulse to the bull wheels when the above described tightening device is operated. It is apparent that this constitutes a very convenient and easily operated means of connecting the bull wheels with the source of power and disconnecting the same therefrom. The other bull wheel 28 is partially encompassed by a brake strap 27 and said strap is arranged to be operated

by a lever 29 pivotally secured at 30 to the frame. A derrick 31 of suitable height is hinged to the upstanding legs 19' at 32 and carries a crown block 34 and crown pulley 33 as is usual. The derrick may be strengthened by spaced cross bars 35, the lower ones of which serve a further purpose hereinafter referred to.

The sand reel drum 36 is journaled at one end in fixed bearing 37 and at its other end in lever 38, a friction wheel 39 is adapted to contact with the periphery of belt wheel 13 when the lever 38 is thrown forward and thus power is furnished to draw up the said line (not shown) and coil the same upon drum 36. The lever 38 is normally held in a backward position so that friction wheel 39 is disengaged by means of a spring 42 fixed at its opposite ends to said lever and to the frame. When in this backward position a brake wheel 40 on the drum shaft 36 is in engagement with a brake member 41 and the said reel is then prevented from movement.

Power is communicated from shaft 14 to rear axle 3 for driving the truck forward or backward by means of a shaft 43. Said shaft is journaled at one end in a fixed bearing 44 in the frame and at the other end in a laterally movable bearing 45 carried on a pivoted bar 46. The bar 46 is pivoted at 47 to the frame and is adapted to be swung on said pivot by engagement with a screw bolt 48 which is suitably mounted for rotation by a steering wheel 48' but held from longitudinal movement in the frame. Such lateral movement of the front end of shaft 43 causes a gear pinion on its end to be engaged with either one of the two pinions 18 on shaft 14 according to the direction of movement desired. A pinion 49 on the rear end of shaft 43 meshes with a gear 50 fixed on the rear axle and thus the driving impulse is transmitted to the truck. When the apparatus is in position for drilling the front end of shaft 43 is moved to an intermediate position so that neither of the pinions 18 is in driving engagement therewith.

The pivotal movement of the front axle may be controlled by a worm shaft 51, having thereon a worm 52 adapted to rotate a drum 53 by means of a suitable worm wheel thereon. Said drum 53 in its rotation shifts the front axle as desired by means of bands 54 as will be readily understood.

Brace rods 55 may extend from the sides of the frame to the king bolt 6 to strengthen the structure.

A foot brake 56 for the main drive wheel 13 is provided, the same being journaled at 57 and provided with an operating foot piece 58 disposed for convenient manipulation.

The main driving belt 12 is loosely mounted upon its belt wheels and a convenient tightening means therefor is provided in the

form of a roller 59 adapted to be pressed upon the top of the same. Said roller is carried by a frame 60 adapted to move vertically in suitable guides 61. A horizontal bar 62 may be fitted to the top of said guides to serve as a rest for the derrick when the same is lowered for transportation. The frame 60 is moved downward when it is desired to make the belt 12 operative, by means of a lever 63 pivoted to a suitable standard and arranged to be operated by a convenient lever handle 64 likewise pivotally mounted.

In Fig. 1 the cable *a* is shown coiled around the bull wheel shaft, the operative end thereof passing around the crank pin roller 16 thence up over the crown pulley 33, and having the drilling stem *b* on the end thereof. In dotted lines in said figure is shown a convenient method of raising the derrick for which our improved apparatus is particularly well designed. The drilling stem *b* has its one end inserted between the cross bars 35 and a hitch of the cable is taken around the projecting end thereof. The engine power being now applied to the bull wheels, it is apparent that the derrick is quickly and easily lifted.

The manner of operation of our machine will it is thought be easily understood from the foregoing description, and its many advantages will be readily apparent. The bull wheels and operating parts being in the front end of the truck a direct vertical pull is obtained wherefrom lateral strains are avoided and greater efficiency attained. The lifting of the drill to four times the arm of the crank wheel is accomplished by the arrangement as shown, in having the movable section of cable *a* which supports the drill *b* from pulley 33 pass loosely around the anti-friction disk 16 and the fixed end of the cable *a* attached to the bull wheels 28, at a point above the highest point reached by the crank pin on wheel 15. By this arrangement the length of cable between the upper pulley 33 and disk 16 is increased or decreased four times the length of the crank arm, as the crank wheel 15 is rotated.

In transporting the machine, should it get stalled in the mud or otherwise, a block and tackle can be connected up to some fixed object and by passing the line around the bull wheel shaft the machine can be extracted by the engine power very easily.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A well drilling apparatus comprising a truck, upright legs secured to the front end thereof and over the front axle, a bull wheel shaft journaled in said legs, a derrick pivotally mounted on said legs and adapted to swing downward and be received by a rear part of the truck, a main driving shaft mounted in said truck frame, means for driving

said bull wheel shaft therefrom, means for giving reciprocation to the drill therefrom and means to drive the truck therefrom.

2. A well drilling apparatus comprising a truck, upright legs secured to the front thereof, a bull wheel shaft journaled in said legs over the front axle, a derrick pivotally mounted on said legs, a main driving shaft journaled in said truck frame, a normally loose belt connecting said latter shaft with the bull wheel shaft and tightening means therefor, the same consisting of a member adapted to bear on said belt, a lever on which said member is carried and manual means for actuating said lever.

3. A well drilling apparatus comprising a truck, upright legs secured to the front end thereof, a bull wheel shaft journaled in said legs and over the front axle, bull wheels on said shaft one being provided with a brake and the other adapted to receive a belt, a main driving shaft, a belt pulley thereon, a normally loose belt passing over said pulley and said second bull wheel and means for tightening said belt at option, the same consisting of a roller adapted to be pressed against said belt, a lever on which said roller is mounted and manual means for operating said lever.

4. A well drilling apparatus comprising a truck, upright legs mounted in the front end thereof, a derrick mounted on said legs, a bull wheel shaft journaled in said legs bull wheels thereon, a main driving shaft journaled in said truck frame, a belt pulley on said latter shaft, a belt normally loose passing over said pulley and one of said bull wheels, manually operated means for tightening said belt at option, and means on said main driving shaft for giving reciprocation to the drill.

5. A well drilling apparatus comprising a truck, bull wheels and a derrick suitably mounted at the front end thereof and over the front axle, a main driving shaft journaled in said truck frame, a normally inoperative connection for driving said bull wheels from said shaft, means for making operative said connection at will, and means on said shaft for reciprocating the drill.

6. A well drilling apparatus comprising a truck, upright legs secured to the front thereof, a bull wheel shaft journaled in said legs over the front axle, rotary bull wheels on said shaft, a derrick pivotally mounted on said legs adjacent to the bull wheels, a main driving shaft journaled in said truck frame, a normally loose belt connecting said latter shaft with the bull wheel shaft and tightening means therefor, the same consisting of a member adapted to bear on said belt, a lever on which said member is carried and manual means for actuating said lever, a drill stem, a cable connected with the drill stem and adapted to support the drill from the der-

rick, cross bars adjacent the lower part of said derrick and adapted to receive between them the drilling stem, and so arranged that the drill stem may be inserted between said cross bars and a connection had with the cable and said bull wheels when rotated to lift the pivoted derrick to its elevated or operative position.

7. A drilling apparatus comprising a truck, bull wheels and a derrick mounted at the front thereof, a main driving shaft journaled in said truck frame, a driving connection from said main shaft to said bull wheels, means on said shaft for reciprocating the drill and means on said shaft for driving the truck forward or backward at option.

8. A drilling apparatus comprising a truck, bull wheels and a derrick mounted at the front thereof, a main driving shaft journaled in said truck frame, means on said shaft for driving the bull wheels, means on said shaft for reciprocating the drill, means on said shaft for driving the truck forward or backward at option, and a brake for checking or controlling at will the rotation of said shaft.

9. A well drilling apparatus comprising a truck, bull wheels and a derrick mounted thereon, a main driving shaft journaled in said truck frame, connections therefrom to drive the bull wheels, means thereon to reciprocate the drill, means thereon to drive the truck forward or backward at option, a driving belt wheel on said shaft, means for transmitting power thereto, and a foot brake adapted to be applied at option to said driving belt wheel.

10. A drilling apparatus comprising a truck, bull wheels and a derrick thereon, a main driving shaft, connections therefrom to operate the bull wheels, to reciprocate the drill and to drive the truck, a second shaft, normally inoperative connections from said latter shaft to said main shaft, and means to render said connections operative to drive the main shaft from the other shaft at option.

11. A drilling apparatus comprising a truck, bull wheels and a derrick thereon, a main driving shaft, connections therefrom to operate the bull wheels, to reciprocate the drill and to drive the truck, a belt wheel on said main shaft, a second shaft, a belt wheel thereon, a belt normally loose on said belt wheels and adjustable means for tightening said belt.

12. A well drilling apparatus comprising a truck, bull wheels and a derrick thereon, a main driving shaft, means thereon to drive the bull wheels at option, means thereon to reciprocate the drill, and means to drive the truck forward or backward at option, said means for driving the truck consisting of oppositely placed gears on said shaft, an intermediate gear between said gears and adapted to be moved to engage either or neither of

them, a shaft on which said intermediate gear is mounted and connections from said shaft to the driving gear of the truck.

13. A well drilling apparatus comprising a truck, a main shaft thereon, connections therefrom to reciprocate the drill and raise the same from the well as desired, means on said shaft for driving the truck forward or backward at option, a brake arranged to operate upon said shaft at option, a second

shaft, a driving connection therefrom to said main shaft and means for rendering said connection operative or inoperative at will.

In testimony whereof, we affix our signatures in presence of two witnesses.

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MILES OKEY.

Witnesses:

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S. E. MIRACLE.