No. 832,362. PATENTED OCT. 2, 1906.

E. O. BOAZ & J. KENEHAN.

WELL DRILLING MACHINE.

APPLICATION FILED MAR. 17, 1906.

2 SHEETS—SHEET 1.

Fig. 8.

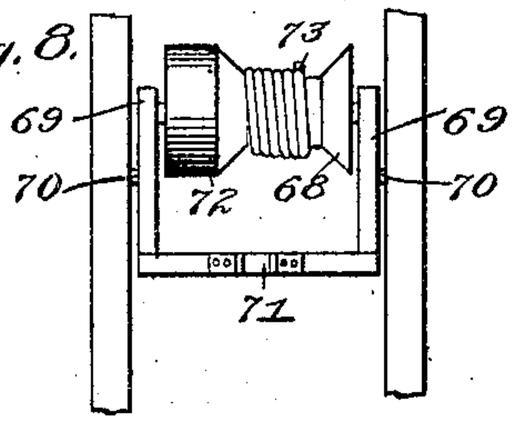


Fig. 9.

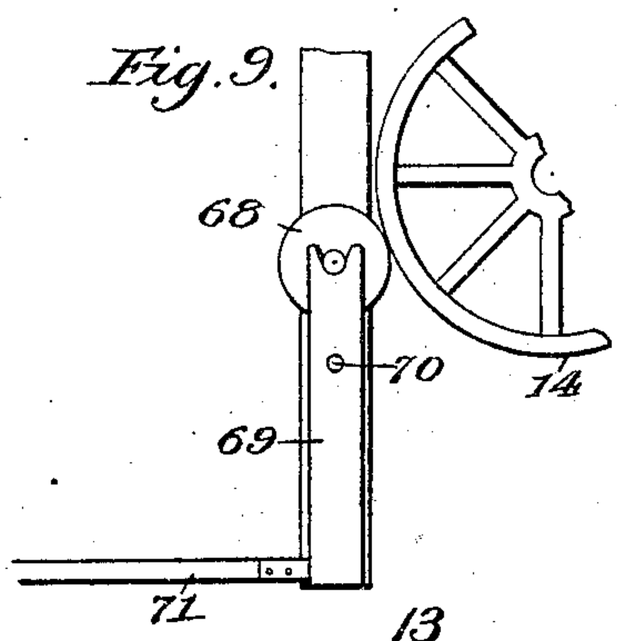


Fig. 1.

Fig. 6.

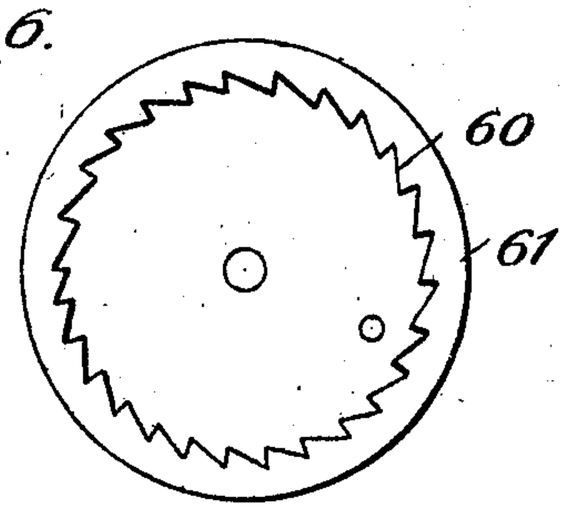
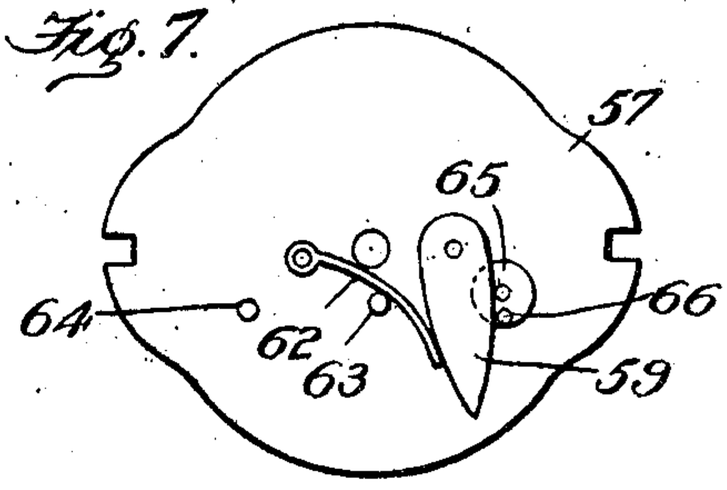


Fig. 7.



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Attorney.

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WELL DRILLING MACHINE.

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2 SHEETS—SHEET 2.

Fig. 2.

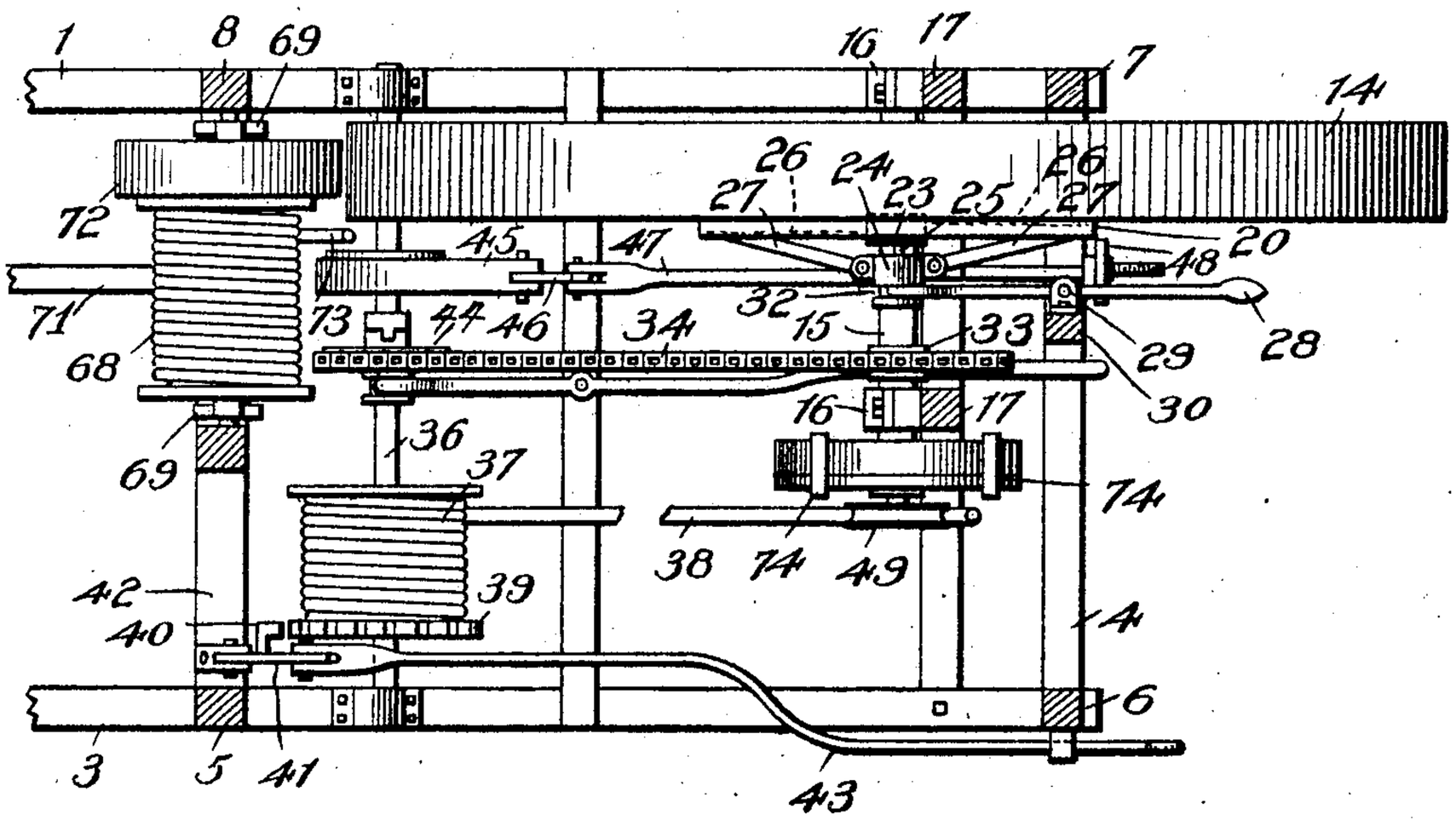


Fig. 3

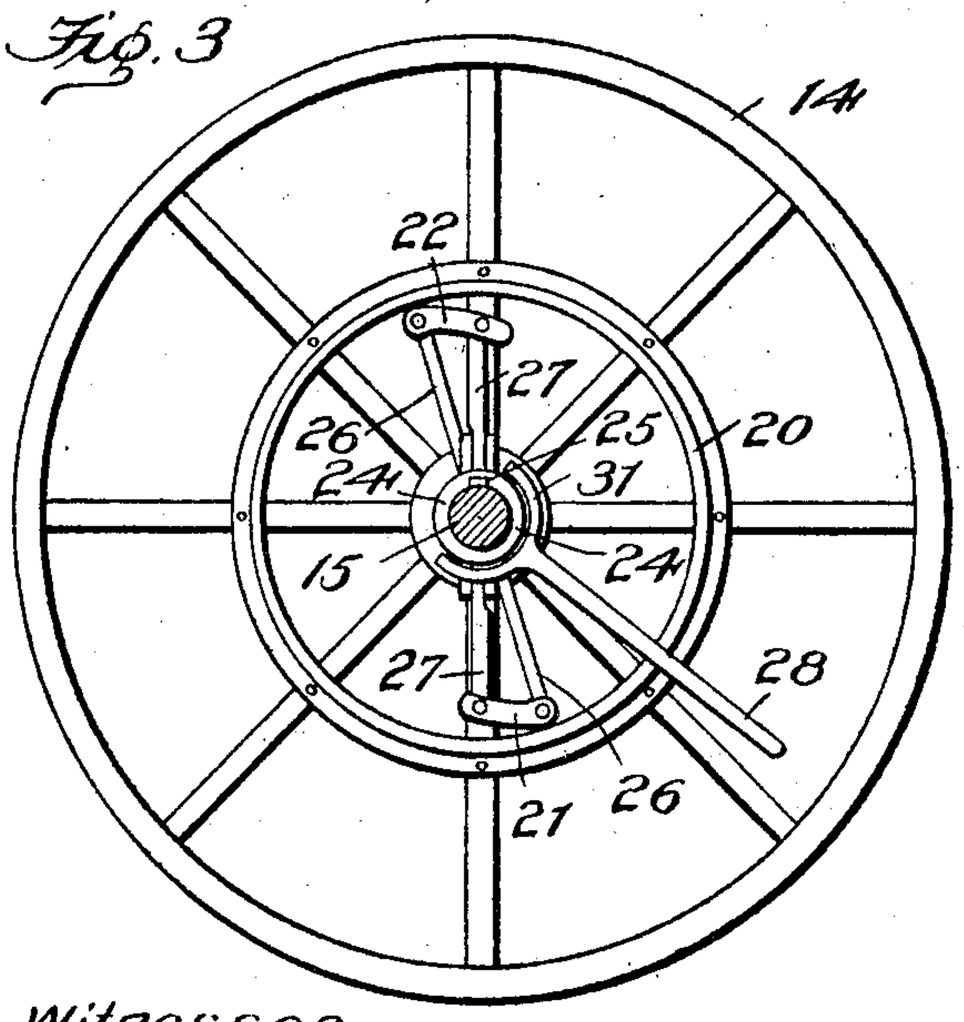


Fig. 4.

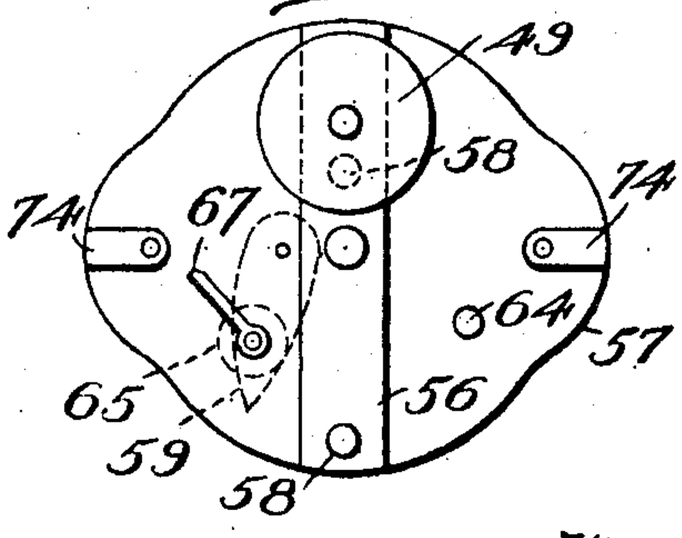
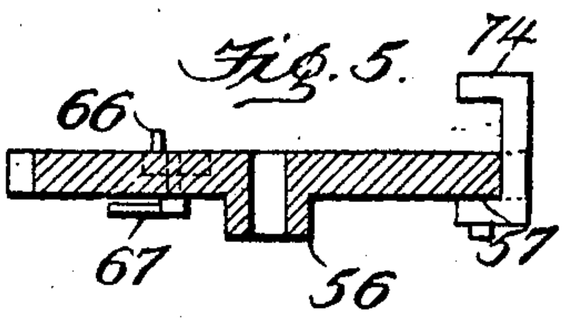


Fig. 5.



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UNITED STATES PATENT OFFICE.

ERNEST O. BOAZ AND JOHN KENEHAN, OF FORT WORTH, TEXAS.

WELL-DRILLING MACHINE.

No. 832,362. Specification of Letters Patent. Patented Oct. 2, 1906.

Application filed March 17, 1906. Serial No. 306,676.

To all whom it may concern:

Be it known that we, ERNEST O. BOAZ and JOHN KENEHAN, citizens of the United States, residing at Fort Worth, Texas, have invented certain new and useful Improvements in Well-Drilling Machines, of which the following is a specification.

This invention relates to well-drilling machines; and the objects are to produce a well-drilling machine which is strong and durable and simple in construction, in which all the power developed can be utilized, there being no cumbersome elements of the machine to cause loss of power, which can be easily and rapidly operated, which requires little power for operation, and which is light, so that the machine can be easily transported from place to place.

Other objects and advantages will be fully explained in the following description, and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings, which form a part of this application.

Figure 1 is a perspective view of the machine. Fig. 2 is a horizontal section of the same, a part of the frame being broken away. Fig. 3 is a side elevation of the main drive-wheel, illustrating the clutch mechanism for engaging said wheel. Fig. 4 is a side elevation of the stroke-controlling sheave-wheel and the ratchet-controlled wheel which carries the sheave-wheel. Fig. 5 is a horizontal diametrical section of the ratchet-controlled wheel. Fig. 6 is a side elevation of the ratchet-wheel. Fig. 7 is a side elevation showing the interior face of the ratchet-controlled wheel and the mechanism carried thereby. Fig. 8 is an elevation of the sand-line spool and cable and the friction gear-wheel, illustrating the manner of mounting the same in swinging or rocking bearings. Fig. 9 is a side elevation of the same with the frame-post omitted.

Similar characters of reference are used to indicate the same parts through the several views.

The machine herein described is a portable machine and is provided with a frame, the principal parts of which are the base-beams 1, 2, 3, and 4, the uprights 5, 6, 7, and 8, and the frame 9, which rests on top of the uprights 5, 6, 7, and 8. The machine is provided with a derrick 10, which is hinged to the uprights 6 and 7 at 11, and this derrick is made rigid by the braces 12. When the machine is to be transported, the braces 12 may be taken down and the derrick folded down on the front part of the machine and rest on the support 13. The main drive-wheel 14 is mounted on a shaft 15, which is journaled in bearings 16, which are attached to uprights 17. This wheel is driven by the belt 18, and the belt may be driven by any suitable power, as by an engine 19. The wheel 14 is mounted loosely on the shaft 15, and means are provided for making the wheel rigid with the shaft whenever the wheel is to be used. A friction-wheel 20 is bolted to the spokes of the wheel 14, and friction-shoes 21 and 22 are provided for engaging the wheel 20. A collar 23 is mounted rigidly on the shaft 15, and a collar 24 is loosely mounted on said shaft and movable axially thereon, the collar moving axially thereon on a key 25 on said shaft. Rods 26 are made rigid with the collar 23, and the shoes 21 and 22 are pivotally connected to the rods 26. Rods or bars 27 are pivotally connected to the collar 24 and also pivotally connected to the shoes 21 and 22. A lever 28 is provided with a fulcrum 29, attached to the upright 30, for moving the collar 24 axially on the shaft 15. The lever 28 is provided with a yoke 31, provided with pins which engage the collar 24 in the annular groove 32. It is apparent that the collar 24 may be moved toward the wheel 14 by the lever 28 and the shoes 21 and 22 made to engage the wheel 20 at will. A sprocket-wheel 33 is mounted rigidly on the shaft 15. Sprocket-wheel 33 drives a sprocket-chain 34. Sprocket-chain 34 drives a sprocket-wheel 35, which is mounted on the shaft 36, which carries the spool 37 for the drill-cable 38. Means are provided for paying out the cable 38. A rack 39 is formed on the spool 37, and a dog 40 is provided for engaging said rack. The dog 40 is carried by a lever 41, which is fulcrumed on the frame-piece 42. The lever 41 is operated by the rod 43, which extends out toward the rear of the machine for the convenience of the operator. The dog 40 may be made to release the rack 39 whenever it is necessary to let out more cable. A friction-brake is also provided for the shaft 36. A brake-wheel 44 is mounted rigidly on the shaft 36, and a strap-brake 45 is provided to engage wheel 44. The strap-brake 45 is attached to a lever 46, which is provided with a suitable fulcrum. (Not shown.) A rod 47 engages the lever 46 and is extended toward the

rear of the machine for the convenience of the operator. The end of the rod 47 is threaded, and a hand-wheel 48 engages this threaded portion for regulating the tension of the strap-brake 45.

The stroke of the drill is regulated by the sheave-wheel 49, which is carried by a drill-wheel. When the cable 38 leaves the spool 37, it runs up over a pulley 50. Pulley 50 is mounted in a hanger 51, which is made yielding by a spiral spring 52. The cable 38 then passes down and under the sheave-wheel 49, then up and over the pulley 53 near the top of the derrick, and then down to the drill. The pulley 53 is also mounted in a yielding hanger 54, which is made yielding by a spiral spring 55.

The sheave-wheel 49 may be set to give a longer or shorter stroke to the drill. A rib 56 is formed on the ratchet-release 57. Bearings 58 may be formed in the rib 56 at different distances from the center of the wheel 57, and the wheel 49 may be journaled in any one of these bearings to regulate the stroke of the drill. The wheel carries a dog 59, which is adapted to engage a ratchet 60. The dog 59 is pivotally mounted on the wheel 57, and a spring 62, which is mounted on the wheel 57, presses against the dog 59, the spring being held against the dog by a pin 63. The ratchet 60 will engage the dog 59 for the purpose of raising the drill. When the wheel 61 has driven the wheel 57 one hundred and eighty degrees, the pull of the drill on the wheel 57 will cause the wheel 57 to run faster than wheel 61, the dog 59 riding over the teeth of the ratchet. This operation will let the drill fall. The ratchet 60 will immediately engage the dog 59 for another stroke of the drill.

Means are provided for detaching the dog 59 from the ratchet 60 for the purpose of hoisting the drill. The dog 59 is detached while the drill is being hoisted; otherwise the drill would be making strokes while being raised. The means for detaching the dog 59 from the ratchet consist of a disk 65, which is mounted in the wheel 57 and carries an eccentric-pin 66 and a crank 67 for turning the disk 65. It also becomes necessary to lock the two wheels 57 and 61 together when drilling in order to retard the drill or to cause the drill to make a lighter stroke. These wheels may be locked together by a bolt 64, which passes through both wheels. This becomes necessary when the drill is about to go through rock or hard earth. If the drill is allowed to make the same hard stroke, it may go so deep into mud that it cannot be withdrawn by ordinary operation. By locking the two parts of the ratchet together the stroke is retarded, the ratchet and sheave-wheel operating as a crank or walking beam. With the wheels locked together in this manner the mud may be stirred sufficiently so that it can be drawn out with a sand-bucket. U-clamps 74 are provided for holding the drill-wheel 57 and the ratchet-wheel 61 in operative relation.

Means are provided for drawing out mud and sand. A spool 68 is mounted in shiftable bearings 69. The bearings 69 are pivotally mounted at 70, and a bar or rod 71 is pivotally connected to the lower part of the bearings for operating the bearings. A pulley 72 is made rigid with the spool 68 and mounted on the same shaft with said spool. Pulley 72 is driven by friction against the main drive-pulley 14. When the sand-line cable 73 is to be used, the sprocket-wheel 44 is ungeared and the friction-pulley 72 is thrown against the drive-wheel 14 by means of the rod or bar 71.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a well-drilling machine provided with a drill, a cable attached to said drill, a spool for said cable, and means for paying out the cable from said spool; a drill-wheel carrying a sheave-wheel for engaging said cable to regulate the stroke of the drill, a ratchet-wheel for driving said drill-wheel, means for intermittently locking said drill-wheel and ratchet-wheel together for drilling purposes, and means for permanently locking said drill-wheel and said ratchet-wheel together.

2. In a well-drilling machine provided with a drill, a cable attached to said drill, a spool for said cable, and means for operating said cable; a drill-wheel carrying a sheave-wheel for regulating the stroke of said drill, a ratchet-wheel for driving said drill-wheel, a spring-pressed dog pivotally mounted on said drill-wheel for locking said drill-wheel and said ratchet-wheel together, means for driving said ratchet-wheel, and means for releasing said drill-wheel from said ratchet-wheel consisting of a disk mounted in said drill-wheel and carrying an eccentric-pin capable of engaging said dog and a crank for operating said disk.

In testimony whereof we set our hands, in the presence of two witnesses, this 17th day of January, 1906.

ERNEST O. BOAZ.
JOHN KENEHAN.

Witnesses:
A. L. JACKSON,
J. W. STITT.