

No. 735,898.

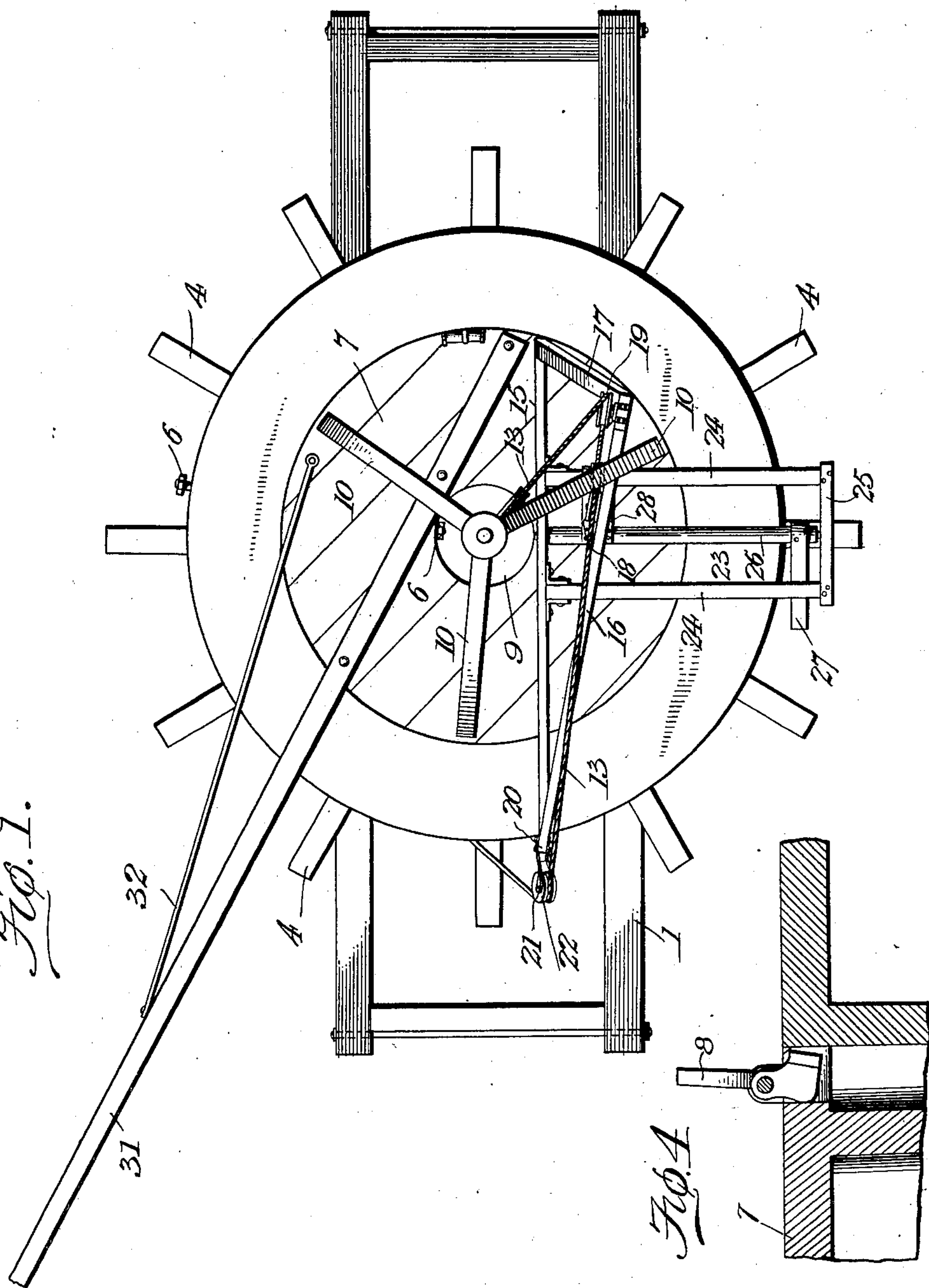
PATENTED AUG. 11, 1903.

R. D. PATTERSON.
WELL DRILLING MACHINE.

APPLICATION FILED APR. 11, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses
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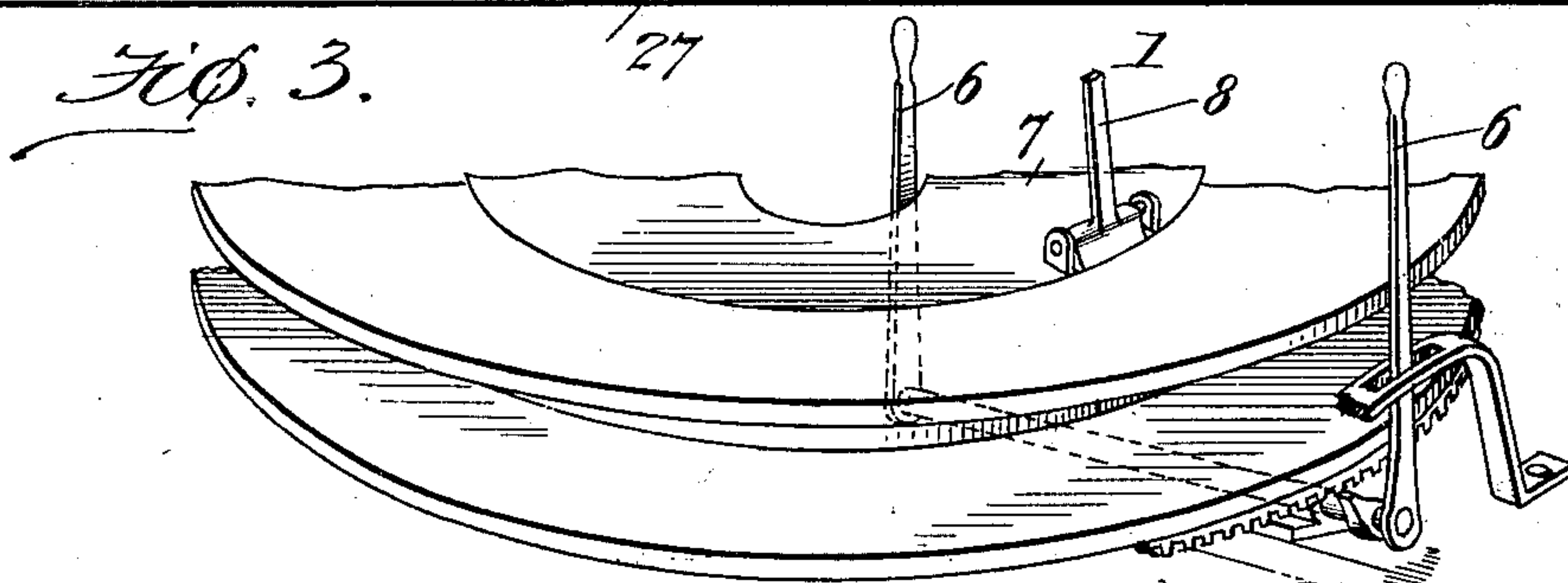
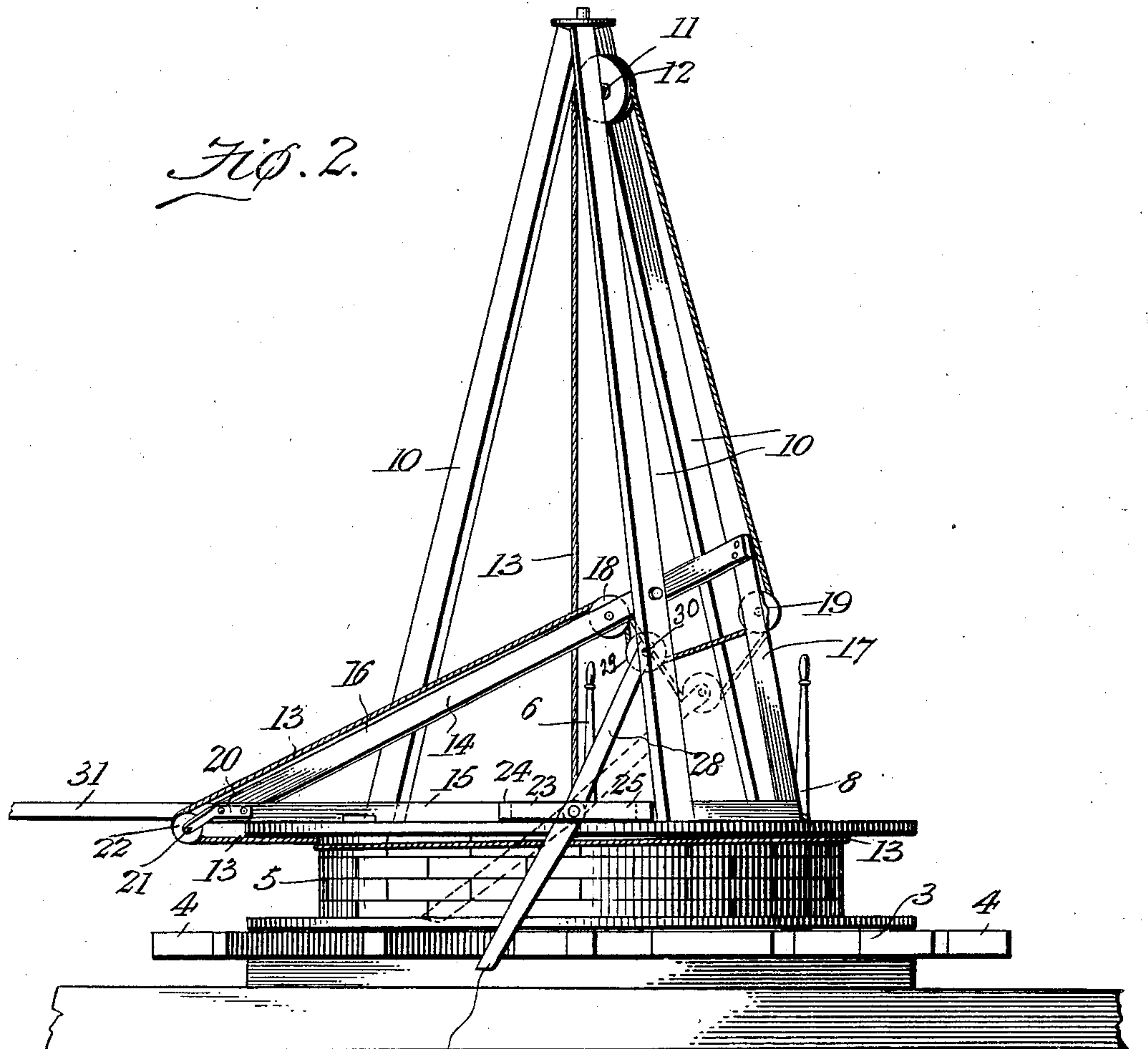
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UNITED STATES PATENT OFFICE.

RANSOM D. PATTERSON, OF OKEMAH, INDIAN TERRITORY, ASSIGNOR OF ONE-HALF TO JOHN D. RICHARDS, OF OKEMAH, INDIAN TERRITORY.

WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 735,898, dated August 11, 1903.

Application filed April 11, 1903. Serial No. 152,199. (No model.)

To all whom it may concern:

Be it known that I, RANSOM D. PATTERSON, a citizen of the United States, residing at Okemah, in the Creek Nation, and Indian Territory, have invented a new and useful Well-Drilling Machine, of which the following is a specification.

This invention relates to well-drilling machinery, and has for its object to provide a machine of simple construction in which all cog-gearing is done away with, in which the rotation of the drill in the hole is accomplished automatically by the operation of the mechanism for reciprocating the drill, and which is adapted to be operated by one man, who is able by the construction of the machine to control the movements of the drill and direct the draft-animals furnishing the power necessary to operate the machine.

With the above and other objects in view, which will appear when the invention is more fully understood, the same consists in the construction and combination of parts of a well-drilling machine hereinafter described, and shown in the accompanying drawings, forming a part of this specification, in which corresponding parts are designated by the same characters of reference throughout.

In the drawings, Figure 1 is a plan view of the machine, and Fig. 2 is a view in side elevation. Fig. 3 is a detail view in perspective showing the arrangement of the parts of the clutches by means of which the rope-winding drum is locked in engagement with the rotatable platform and the base of the machine. Fig. 4 is a detail view in section showing the structure and operation of the clutch 8.

Referring to the drawings by reference characters, 1 designates the base of the machine, which is preferably formed of heavy timbers firmly secured together and comprising the beams 2 2 and the superstructure 3, having the radially-disposed arms 4 4 4, &c. Rotatably mounted on the base 1 is a rope-winding drum 5, provided with a clutch 6, by means of which the drum may be locked securely to the base 1, thereby preventing the rotation of the drum when desired. Supported upon the base within the drum 5 and on a level with the upper surface thereof is a rotatable platform 7, upon which is supported

the mechanism for operating the drill in the drill-hole. The platform 7 is provided with a clutch 8, by means of which it may be locked firmly into engagement with the drum 5, so that the platform and drum may be caused to rotate together under certain circumstances. At the center of the platform 7 is provided a circular opening 9 to permit the passage of the drill and drill-cable.

Rising above the platform 7 and firmly secured thereto is an upright frame composed of the inclined members 10, connected at their tops, as shown, and having their lower ends separated, so as to form a firm base for the frame. Secured upon two of the inclined members 10 is a shaft 11, upon which is rotatably mounted a pulley 12 for supporting the drill-cable 13. Also mounted on the platform 7 is a frame 14, comprising a base member 15, the long oblique member 16, and the short oblique member 17, united to form a triangle, as shown, and having mounted thereon the pulleys 18 and 19, which are carried by the oblique members 16 and 17. At the point of attachment of the long oblique member 16 to the base member 15 there is mounted a bracket 20, at the end of which is provided a short shaft 21, upon which is journaled a pulley 22 at an angle to the horizontal plane, as shown.

Disposed at right angles to the base member 15 of the frame 14 is a frame 23, comprising the two parallel bars 24 24 and the cross-bar 25. The frame 23 serves as a support for the rock-shaft 26, one end of the shaft being journaled in the cross-bar 25 and the other end upon the base 15 of the frame 14, which forms the inner end of the frame 23. The rock-shaft 26 is provided at its outer end with the rigidly-mounted tappet-arm 27, adapted to engage the stationary projecting arms 4, provided on the base, so as to rock the shaft 26 for the purpose presently to be explained. Near the inner end of the shaft 26 are rigidly secured thereto the arms 28, which extend at right angles to the shaft 26 in a direction directly opposite that in which the tappet-arm 27 is disposed, so that when the tappet-arm 27 is directed downward the arms 28 will be directed upward. Between the free ends of the arms 28 is mounted a small pul-

ley 29 upon a shaft 30, mounted in said arms. The arms 28 are so disposed with reference to the upper portion of the frame 14 and the pulleys 18 and 19 carried thereon that the pulley 29 lies in substantially the same plane as the pulleys 18 and 19 and is adapted to engage the drill-cable, which passes over said pulleys 18 and 19, as shown.

The means for imparting rotation to the platform 7 comprises a sweep 31, rigidly mounted thereon, as shown, and braced by a stay rod or wire 32. The sweep 31 and stay-rod 32 form an arm to which is attached at its outer end one or more draft-animals to furnish the power necessary to impart rotation to the platform 7 by pulling upon said arm. It will be observed that owing to the fact that the arm to which the draft-animals are attached is directly connected with the platform of the drilling-machine upon which the operator stands one man will be enabled to control the operation of the drilling-machine and also direct the movements of the draft-animals furnishing the power for operating the same.

In use the winding-drum will be locked to the rotary platform when it is desired to reciprocate the drill. When it is desired to wind the cable on the drum in order to withdraw the drill from the hole, it will be locked to the base, and when the cable is allowed to unwind from the drum to lower the drill into the hole the drum will not be locked either to the platform or the base, but will be allowed to rotate under the pull exerted thereon by the drill-cable to lower the drill in the hole. Let it be assumed that the drill has been adjusted in proper position in the hole by paying out the requisite amount of cable from the drum and it is desired to reciprocate the drill to continue the drilling operation. The platform will be locked to the drum by means of the clutch 8, and rotation will be imparted to the platform and drum by the draft-animals attached to the sweep 31. This will cause the rotation of the platform carrying the rock-shaft 26, and the tappet-arm 27 at the end thereof will be caused to contact successively with the arms 4 4 4, &c., rigidly mounted upon the base of the machine. Each contact of the tappet-arm 27 with one of the arms 4 will rock the shaft 26 upon its axis and impart a downward movement to the arms 28, between which is mounted the pulley 29, engaging the drill-cable 13. Each downward movement of the arms 28 draws the cable upward in the drill-hole and as soon as the tappet-arm 27 passes out of contact with one of the stationary arms 4 the weight of the drill causes it to descend rapidly into the hole and strike against the bottom thereof, and the successive blows of the drill cause the deepening of the hole. As the upright frame formed of the inclined members 10 is rigidly secured to the platform 7 and rotates therewith, carrying the pulley 12, the rotation of the platform must neces-

sarily be imparted to the drill-cable 13, so that a partial rotation of the drill in the hole results at every reciprocation of the drill. When it is desired to pay out a little more cable to compensate for the deepening of the drill-hole by the action of the drill, the clutch 8 is released for a moment and the drum 5 is rotated independently of the platform 7 a sufficient distance to unwind the desired amount of cable. In order to wind the cable upon the drum in order to withdraw the drill from the drill-hole, the clutch 6 is set to lock the drum securely to the base 1, and the clutch 8, connecting the platform 7 with the drum, is released. Then when motion is imparted to the platform 7 by the pull of the draft-animals the cable will be wound upon the drum, causing the withdrawal of the drill from the hole. During this operation, in order to prevent the reciprocation of the drill from the contact of tappet-arm 27 and the projecting arms 4 of the base, it is desirable to depress the pulley-carrying arms 28 low enough to lift the tappet-arm above the level of the projecting arms 4 4 4, &c., and hold it in this position, which is indicated by dotted lines in Fig. 2.

It will be observed that the machine as described and shown in the drawings is entirely free from gearing of any sort and, with the exception of a few rods and bolts for assembling, the parts and the pulleys for supporting the drill-cable may be constructed entirely of wood. This feature is of value because the machine may be cheaply constructed by any one having ordinary skill in the use of tools if the rods and bolts required can be obtained from a blacksmith. None of the parts of the machine are of such character that special machinery is required for their manufacture, and if broken any of them may be readily replaced without sending to a distant point for a duplicate.

It is of course understood that while the machine as described and shown in the accompanying drawings forms the preferred form of embodiment of my invention changes may be made in the form, proportions, and mode of assemblage of the parts without departing from the spirit of the invention or scope of the appended claims.

Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a well-drilling machine, the combination with a suitable base of a rotatable platform carrying mechanism for reciprocating a drill, a winding-drum also rotatable on said base, and clutches for locking said drum to said base or to said platform at will.

2. In a well-drilling machine, the combination with a suitable base having a plurality of rigid projecting arms and a rotatable platform having a rock-shaft mounted thereon and provided at one end with a tappet adapted to contact with said projecting arms and at

the other end with an arm provided with drill-cable-engaging means.

5 3. In combination in a well-drilling machine, a suitable base, a rotatable platform mounted on said base, a frame rigidly mounted on said platform and provided with drill-cable-engaging means, a winding-drum also mounted on said base, to which the end of the drill-cable is attached, and means for holding

said drum stationary while the platform rotates.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

RANSOM D. PATTERSON.

Witnesses:

E. L. MELCHER,

G. R. DAVIS.