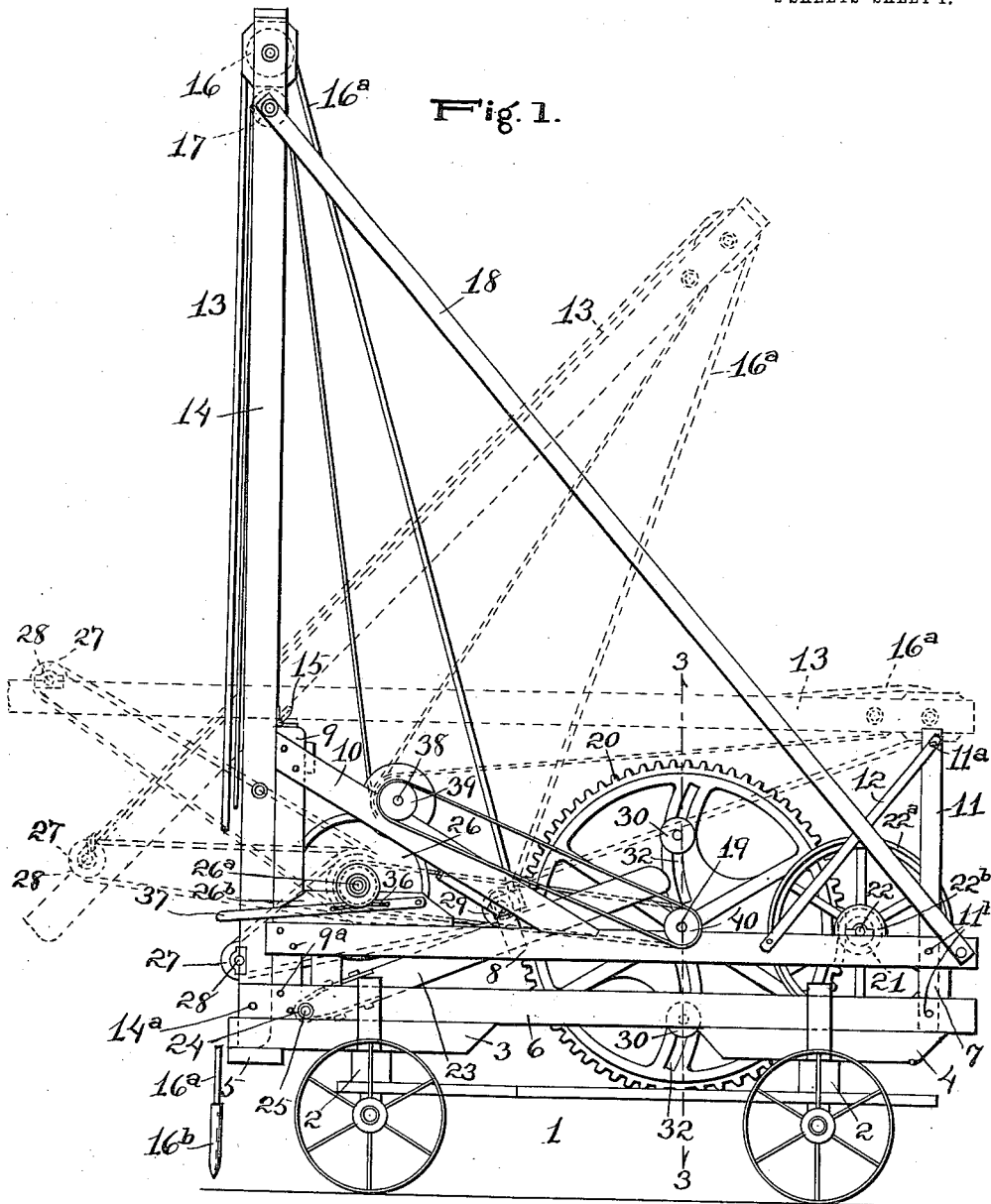


C. F. GULDE.
WELL DRILLING MACHINE.
APPLICATION FILED AUG. 31, 1911.

1,013,654.

Patented Jan. 2, 1912.

2 SHEETS-SHEET 1.



Inventor

Charles F. Gulde.

Witnesses

Stuart Hilder.
Francis W. Anderson.

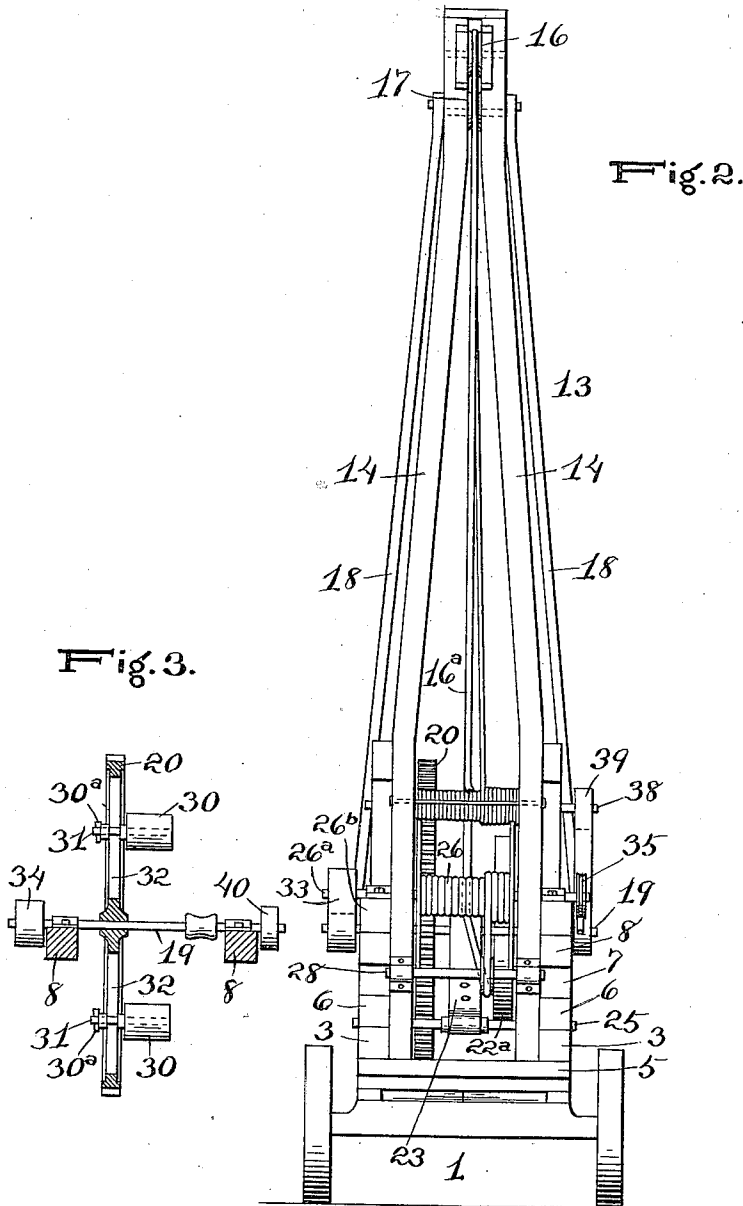
By E. W. Anderson & son
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UNITED STATES PATENT OFFICE.

CHARLES F. GULDE, OF BEACH, NORTH DAKOTA.

WELL-DRILLING MACHINE.

1,013,654.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed August 31, 1911. Serial No. 647,027.

To all whom it may concern:

Be it known that I, CHARLES F. GULDE, a citizen of the United States, resident of Beach, in the county of Billings and State of North Dakota, have made a certain new and useful Invention in Well-Drilling Machines; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the invention, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 is a side view of the invention, the tower being shown in partly lowered position in dotted lines. Fig. 2 is a front view of the invention. Fig. 3 is a detail sectional view on the line 3—3, Fig. 1.

The invention has relation to well drilling machines, and it consists in the novel construction and combinations of parts, as hereinafter set forth.

In the accompanying drawings, illustrating the invention, the numeral 1 designates a wheeled support or wagon, having front and rear bolsters 2, 2, upon which are mounted longitudinal end pieces 3, 3 and 4, 4, the forward end pieces 3, 3 having a lower cross bar connection 5 and the members of both pairs of end pieces being connected by upper longitudinal parallel bars 6, 6 having upper blocks 7, 7 upon which are mounted parallel longitudinal bars 8, 8. Forward corner posts 9, 9 are mounted within the longitudinal bars 6, 6 and 8, 8, being bolted thereto at 9^a, and have inclined rearward extending brace bars 10, 10 bolted at their lower ends to the bars 8, 8. Rear corner posts 11, 11 are mounted within the bars 6, 6 and 8, 8, being bolted thereto at 11^b and have inclined brace connections 12, 12 with the bars 8, 8 and a top cross bar 11^a.

A tower 13 composed of two side bar members 14, 14 having suitable cross brace connections is hinged intermediately of its length at 15 to the upper ends of the posts 9, 9 the bars 14 fitting at their lower ends closely between the longitudinal bars 8, 8 and 6, 6 and between the end pieces 3, 3 whereby the tower is well braced against movement transversely, said bars 14 being preferably bolted at 14^a to the longitudinal bars 6, 6 to assist in maintaining the tower in raised position. This tower carries at its upper end a pulley 16 for the rope 16^a lead-

ing to the drill 16^b, and below this pulley a smaller pulley 17 for the rope leading to the slush bucket. An inclined brace 18 is preferably provided at each side of the tower and extends from the upper end thereof to the rear ends of the bars 8, 8.

Mounted in journal bearings supported upon the bars 8, 8 is a shaft 19 carrying a large gear wheel 20, which is turned by a pinion 21 upon a main drive shaft 22 having journal bearings supported from the bars 8, 8, and carrying also preferably a fly-wheel 22^a and a pulley 22^b to which the power is applied.

23 is a trip arm pivoted at its lower forward end at 24 upon a shaft or bolt 25 supported from the bars 6, 6, said trip arm having extension rearward at one side of and adjacent to the large gear wheel 20.

26 is a reel for the drill rope or cable, mounted upon a shaft 26^a having journal bearings supported from blocks 26^b carried by the bars 8, 8. The rope or cable from this reel extends first forward around a guide pulley 27 having slidable movement upon a shaft 28 carried by the lower ends of the tower bars; thence rearward around a pulley 29 located intermediately of the length of the trip arm; thence upward around the pulley 16 of the tower and downward to the drill, which through its weight forms a counterbalance for the trip arm and maintains it normally in raised position.

The large gear 20 carries two trip rollers 30, 30 supported from laterally extending shafts or bolts 31, 31 extending through arcuate slots 32, 32 of said wheel and having adjustment in said slots to vary the distance thereof from the center of said wheel, whereby the stroke of the trip arm is altered to suit the requirements. These trip rollers are located at points diametrically opposite upon the wheel 20, and in the turning of said wheel strike the rounded free end of the trip arm and depress said arm twice in each rotation of the wheel, the drill being raised at each such depression, and falling through its weight and striking the rock or work with the accumulated force or momentum acquired in falling. Each trip roller is capable of being detached from its carrying wheel by removing a suitable wedge or key 30^a engaging a slot of the shaft 31.

The reel for the drill rope has upon its shaft 26^a a pulley 33, driven by a belt from

a pulley 34 upon the shaft 19. This reel shaft has also a pulley 35 engaged by a brake strap 36 controlled by a lever 37. The slush bucket reel shaft 38 is provided with a pulley 39 driven by a belt from a pulley 40 upon the shaft 19.

When the brace arm for the tower is disconnected and the bolts 14^a at the lower end of the tower removed, the tower may be lowered upon its hinge to a substantially horizontal position, when it will rest upon the tops of the forward posts and upon the cross bar 11^a of the rear corner posts. The lowering of the tower is accomplished by fastening the drill rope 16^a to the shaft 28 at the lower end of the tower and then letting off slack rope gradually from the drill rope reel 26, the friction brake 37 being found useful in checking the rope in its passage, and the heavy lower end of the tower acting as a counterbalance to facilitate an easy fall of the tower. The tower is raised by taking up the slack in the drill rope, or by turning the drill rope reel to wind the rope thereupon, this being the reverse of the operation in lowering.

If desired the gear wheel 20 may be provided in duplicate, with the trip rollers supported between the same. The use of the large wheel carrying the trip rollers is of advantage in affording a greater range of adjustment of said rollers in varying the stroke of the trip arm, and in affording a greater leverage of the rollers in their action upon the trip arm. Either one or both of the trip rollers may be used, according to whether a single or double, or a slow or rapid action of the trip arm is desired. The arcuate slots of the wheel 20 in which the shafts of the trip rollers are mounted extend rearward from the trip arm at their upper portions when approaching the trip arm, whereby the trip roller when adjusted outwardly will strike the rounded end of the trip arm at the proper point.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a well drilling machine, a support having opposite posts, a tower having intermediately of its length a hinged connection with the upper ends of said posts and capable of being lowered to rest thereupon, a drill rope reel upon said support at one side of the tower, guide pulleys for the drill rope at the upper and lower ends of the tower, a pivoted trip arm carrying a pulley for the drill rope, and means for intermittently depressing said trip arm including a rotary wheel having a slot, and a laterally projecting trip roller having a carrying shaft engaging and capable of adjustment in said slot to vary the stroke of the trip arm.

2. In a well drilling machine, a support

having opposite posts, a tower having intermediately of its length a hinged connection with the upper ends of said posts and capable of being lowered to rest thereupon, a drill rope reel upon said support at one side of the tower, guide pulleys for the drill rope at the upper and lower ends of the tower, a pivoted trip arm carrying a pulley for the drill rope, means for intermittently depressing said trip arm including a rotary wheel having a slot and a laterally projecting trip roller having a carrying shaft engaging and capable of adjustment in said slot, a drill rope passing from said reel under the pulley at the lower end of the tower, under the pulley from the trip arm, up over the pulley at the upper end of the tower, and a brake for the drill rope reel.

3. In a well drilling machine, a support having opposite forward posts and opposite rear posts, a transverse connection for the rear posts, a tower having intermediately of its length a hinged connection with the upper ends of the forward posts and capable of being lowered to rest thereupon and upon said transverse connection, a drill rope reel upon said support at one side of the tower, guide pulleys for the drill rope at the upper and lower ends of the tower, a pivoted trip arm carrying a pulley for the drill rope, and means for intermittently depressing said trip arm including a rotary wheel having an arcuate slot and a laterally projecting trip roller having a carrying shaft engaging and capable of adjustment in said slot to vary the stroke of the trip arm.

4. In a well drilling machine, a support having upper and lower vertically and transversely separated longitudinal bars, opposite posts having connection with said bars, a tower having bracing engagement within said bars and intermediately of its length a hinged connection with the upper ends of said posts and capable of being lowered to rest thereupon, a drill rope reel upon said support at one side of the tower, guide pulleys for the drill rope at the upper and lower ends of the tower, a pivoted trip arm carrying a pulley for the drill rope, and means for intermittently depressing said trip arm including a rotary wheel having an arcuate slot and a laterally projecting trip roller having a carrying shaft engaging and capable of adjustment in said slot.

5. In a well drilling machine, a support having opposite posts, a tower having intermediately of its length a hinged connection with the upper ends of said posts and capable of being lowered to rest thereupon, a drill rope reel upon said support at one side of the tower, a friction brake for said reel, a slush bucket reel upon said support at one side of the tower, guide pulleys for the drill rope at the upper and lower ends of the tower, a guide pulley for the slush

bucket rope at the upper end of the tower,
a pivoted trip arm carrying a guide pulley
for the drill rope, and means for intermit-
tently depressing said trip arm, including a
5 power shaft, a countershaft, a wheel upon
the countershaft having a driving connec-
tion with the power shaft, and diametrically
opposite arcuate slots, and laterally project-
ing trip rollers having carrying shafts en-

gaging and capable of adjustment in said 10
slots.

In testimony whereof I affix my signa-
ture, in presence of two witnesses.

CHARLES F. GULDE.

Witnesses:

J. R. WATERS,

M. J. SCHMITZ.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."