

(No Model.)

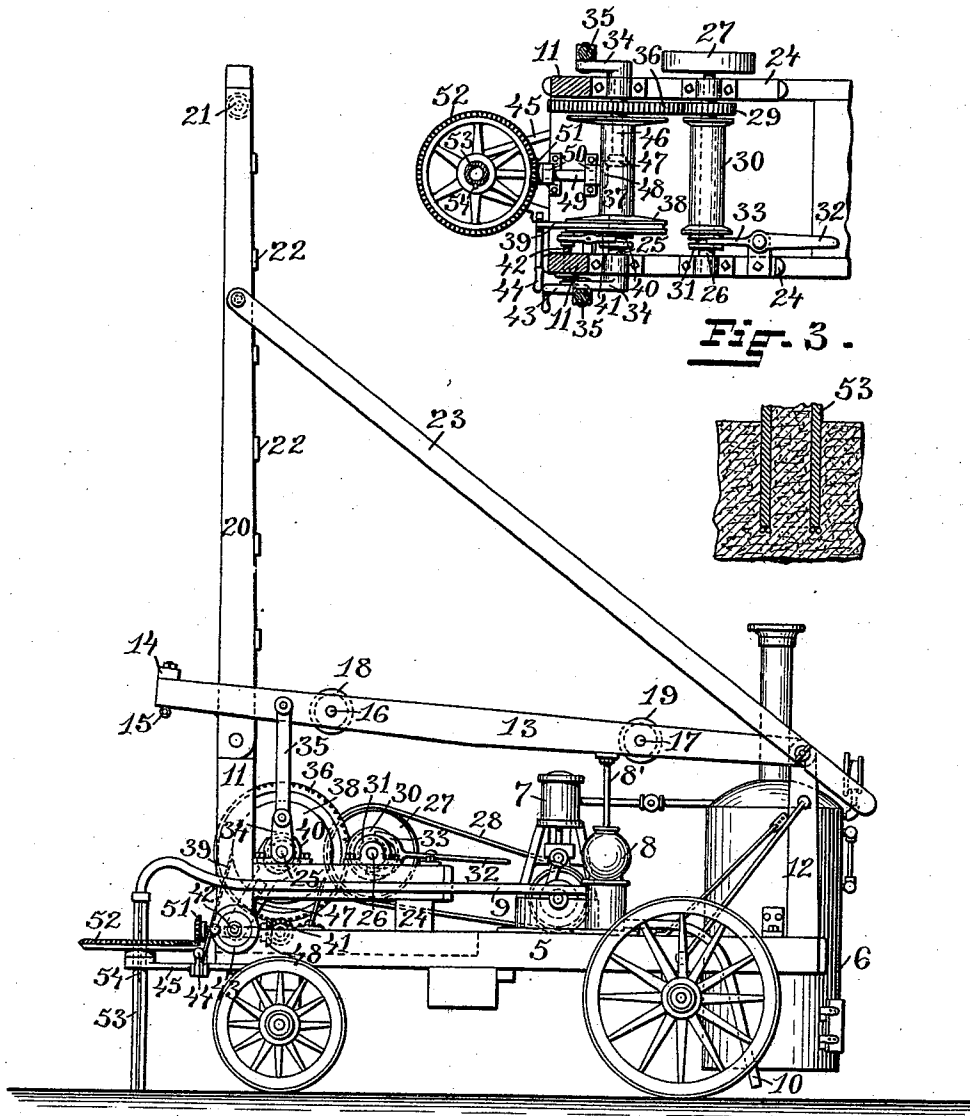
C. A. RAY.
WELL DRILLING MACHINE.

No. 516,977.

Patented Mar. 20, 1894.

Fig. 1.

Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES A. RAY, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO THE RAY
ARTESIAN WELL AND MACHINE COMPANY, OF SAME PLACE.

WELL-DRILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 516,977, dated March 20, 1894.

Application filed July 5, 1893. Serial No. 479,607. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. RAY, of Providence, in the county of Providence and State of Rhode Island, have invented certain
5 new and useful Improvements in Well-Drilling Machines; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.
10

This invention relates to improvements in portable well-drilling machines.

The object of the invention is to provide a portable well-drilling machine which will be
15 more compact in form and more readily controlled in its operation than those heretofore constructed.

Another object of the invention is to so construct a well-drilling machine that the
20 sand line and tool lines may be operated by drums independently carried on the gear-shafts.

Still another object of the invention is to provide a portable well-drilling machine with
25 means for rotating and reciprocating the drilling-mechanism.

The invention consists in certain peculiar features of construction and combination of parts which will hereinafter be more fully described and pointed out in the claim.
30

Figure 1 represents a side elevation of the improved well-drilling machine. Fig. 2 represents a plan view of the forward portion thereof, partly in section, to show the driving-gear with the sand-line reel and tool-line
35 drum in combination therewith, as well as the devices for governing the operations of the drum and reel. Fig. 3 represents a sectional view of one form of drill used in the improved machine and illustrating its action on the material through which the boring is made.
40

Similar numbers of reference designate corresponding parts throughout.

45 In the drawings 5 indicates a substantial base, or frame-work, mounted on wheels; to the forward portion a pole carrying whiffletrees may be secured for use in attaching horses when the machine is to be moved,—
50 mounted in the rear end of the frame is a

steam boiler 6 and on the frame is an engine 7 provided with a drive-shaft and a belt-pulley, the valve-chest of the engine being connected with the boiler by suitable pipes;—
also mounted on the frame is a pump 8 provided with pipes, or hose, 9 and 10. From
55 the four corners of the frame extend the vertical-standards 11—11 and 12—12 which may be suitably braced,—to the upper ends of the rear standards 12—12 are pivoted the ends of
60 the side-bars 13—13 of a walking-beam frame, the forward ends of the bars being connected by the cross-piece 14 in which the eye-bolt 15 is fastened, in these side-bars are mounted
shafts 16 and 17 carrying pulley-sheaves 18
65 and 19. To the upper ends of the standards 11—11 are pivoted the lower ends of the side-arms 20—20 of a derrick-frame provided at the top with pulleys 21 and cross braced by the step-pieces 22—22. To the upper portions
70 of the derrick-arms 20 are pivoted the supporting-braces 23—23 the rear ends of which are removably clamped to the upper ends of the standards 12—12.

On the forward portion of the base, or
75 frame, 5 are mounted side-frames 24—24 in the upper portions of which are journaled two parallel shafts 25 and 26. On one end of the shaft 26 is secured the belt-pulley 27 connected by the belt 28 with the driving-pulley
80 of the engine,—on this shaft 26, between the supporting-frames, is rigidly fastened the gear 29, and loosely mounted on this shaft is the sand-line reel 30 having end disks and a grooved-extension 31, the disk of the reel 30
85 nearest the gear 29 being adapted to closely fit against the side of the gear when the reel is forced sufficiently far in that direction, the reel being operated by the lever 32 pivoted to a stud or extension, secured to a side-frame
90 and having curved-arms 33 the ends of which engage the groove in the extension 31 of the reel. When it is desired to wind the sand line on to the reel 30 the lever 32 is operated
95 to throw the reel-disk into frictional contact with the gear 29, the lever being then held until the reel has been rotated by the gear sufficiently to wind up the required amount of line.

Mounted on the ends of the shaft 25, be- 100

yond the end-frames 24, are crank-arms 34—34, to each of these crank-arms is pivoted a connecting-rod 35—35 the upper end of which is pivoted to a corresponding side-bar 13 of the walking-beam frame,—as one of these side-bars is connected with the plunger-rod 8' of the pump 8 the rotation of the shaft will operate the pump. Also mounted on the shaft 15 is the large gear 36 which intermeshes with the gear 29 and is driven thereby.

Loosely mounted on the shaft 25, between the gear 36 and its opposite bearing, is the tool-line drum 37 having end disks one of which is adapted to be forced into contact with the side of the gear 36 while the edge of the other is furnished with a grooved-flange 38 on which the friction-band 39 bears,—the drum is furnished with a grooved extension 40 and is moved along the shaft 25 by means of the lever 41 pivoted to a stud on the frame and engaging the groove of the extension 40, the lower end of the lever being pivotally connected with a screw-shaft 42 passing through a screw-threaded perforation in the side-frame and operated by the hand-wheel 43. One end of the friction-band 39 is fastened to the surface of the frame 5 while the other is secured to the brake-lever 44 which is pivoted to the extension-frame 45. By the rotation of the hand-wheel 43 the drum is moved along the shaft 25 toward and away from the gear 36; when in contact with that gear, the drum is rotated by the frictional contact, and the tool-line, passing through one of the pulleys 21 and secured to the drum, is wound on the drum,—when it is desired to lower the tool the drum is drawn out of contact with the gear 36 and is governed by means of the brake-lever 44 and the brake-band.

The small shaft 46, shown in dotted lines in Fig. 2, is journaled in bracket-bearings secured to the frame 5 immediately below the shaft 25. At one end this shaft has a small gear which intermeshes with the gear 36, and on the other end is mounted the bevel-gear 47, this gear in turn intermeshing with a similar gear 48 on the inner end of the shaft 49 journaled in the bracket 50—50 secured to the frame 5 and having on its outer end the beveled-gear 51.

From the forward end of the frame 5 and firmly secured thereto extends the frame 45 having a vertical-bearing in which the central-sleeve of the beveled-gear 52 is journaled; this gear intermeshes with and is driven by the gear 51, the bore of the central sleeve of this gear 52 is sufficiently large to allow the passage of the drilling-tube 53, and in the material of the sleeve is formed a longitudinal key-seat to receive the key 54, the outer surface of the tube 53 having also a similar seat into which one edge of the key fits to prevent the independent rotation of the gear 52 around the tube.

When the drilling-machine is to be used in combination with a vertically-reciprocating tool, the extension-frame 45 and the gear 52 may be removed and the tool-line may be either fastened to the eye-bolt 15 or, after being carried through the pulley 21, then under the sheave 18 and over that marked 19, is fastened to the tool-line drum 37, in either case the rapid vibration of the walking-beam frame serves to rapidly lift and lower the tool;—where the tube 53 is sufficiently large to form a proper casing the tool may be lowered through the open top of the tube.

The pipe, or hose, 9, leading from the pump 8, is shown as connected with the top of the tube 53, but this may be disconnected at will, being secured thereto by the ordinary coupling-device.

When drilling with the tube 53 the material is usually cut away in the shape of an annular channel surrounding a core which has a diameter about equal to the internal diameter of the tube, in this case I find that the boring is greatly accelerated by the use of steel or other hardened balls, indicated in Fig. 3, or coarse emery placed in the bore after a short distance has been drilled, the material being thus ground away by the balls, or emery, during the operation of the tube.

In transporting the drilling-machine the derrick-supports 23 are released from the standards 12—12 and the derrick is then folded down upon the standards which support the rear ends, the supports 23 being then turned forward and secured to the side-bars of the walking-beam frame.

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

The combination with the platform, or frame, 5 an engine, or motor, 7 having a belt-pulley mounted thereon, the pump 8 and the side-frames 24 also mounted on the platform, the standards 11—11 and 12—12 secured to the corners of the platform, a derrick the side-arms 20 of which are pivoted to the standards 11—11, supports 23 pivoted to the side-arms of the derrick and secured to the standards 12—12, a walking-beam frame the side-arms 13—13 of which are pivoted to the standards 12—12, and a plunger working in the pump and connected with one of the side-arms 13, of the shaft 26 journaled in bearings of the side frames, the pulley 27 and gear 29 secured on said shaft, the reel 30 having the grooved-extension 31 loosely mounted on the shaft, a belt connecting the pulley 27 with that of the motor, the pivoted-lever 32 for reciprocating the reel, the shaft 25 having the gear 36 intermeshing with the gear 29 journaled in bearings of the side-frames, crank-arms 34—34 secured to the ends of this shaft, connecting-rods 35—35 pivoted to the crank-arms and to the bars of the walking-beam, the drum 37 loosely mounted on the

shaft 25 and having the friction-flange 38 and the grooved-extension 40, the pivoted-arm 41 engaging the groove of the extension, the screw-shaft 42 having the hand-wheel 43 for
5 operating the arm, the friction-band 39 surrounding the friction-flange 38 secured at one end to the platform and to the pivoted brake-lever 44 to which the other end of the brake-

band is secured, as and for the purpose described.

In witness whereof I have hereunto set my hand.

CHARLES A. RAY.

Witnesses:

HENRY J. MILLER,
M. F. BLIGH.