P. J. GILDEA.

WELL MAKING APPARATUS.

APPLICATION FILED DEC. 19, 1918.

1,331,103.

Patented Feb. 17, 1920.

FIG. 1

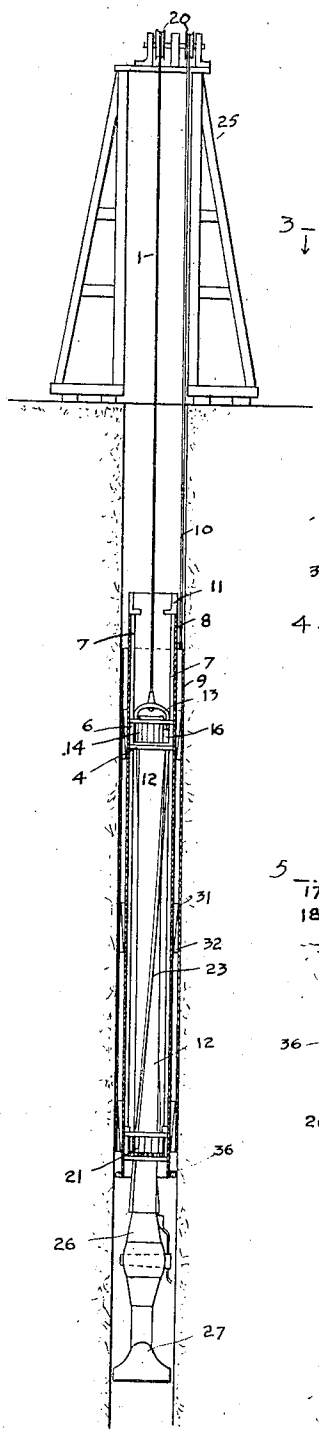


FIG. 2

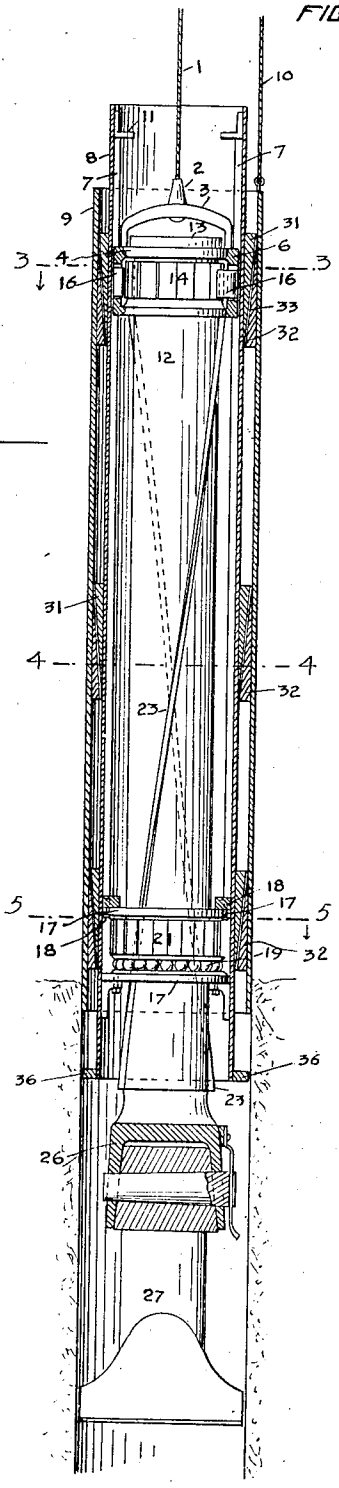


FIG. 3

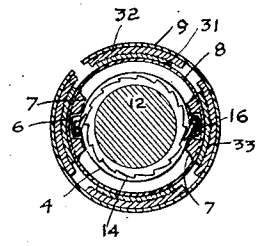
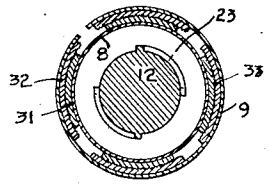


FIG. 4



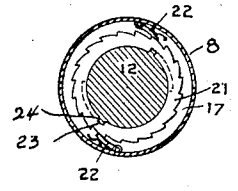


FIG. 5

INVENTOR
P. J. GILDEA

BY
Fm. Wright

ATTY

UNITED STATES PATENT OFFICE.

PETER J. GILDEA, OF SAN FRANCISCO, CALIFORNIA.

WELL-MAKING APPARATUS.

1,331,103. Specification of Letters Patent. Patented Feb. 17, 1920.

Application filed December 19, 1918. Serial No. 267,429.

To all whom it may concern:

Be it known that I, PETER J. GILDEA, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Well-Making Apparatus, of which the following is a specification.

The present invention relates to improvements in apparatus for boring and constructing holes in the ground, for Artesian and oil wells, prospecting holes, tunnels and the like; and the object of the invention is to provide such apparatus which will be cheaper, safer, more serviceable and more reliable, and by which the holes so constructed will be more durable.

In the accompanying drawings, Figure 1 is a vertical section of a well, showing my improved boring apparatus in side elevation therein; Fig. 2 is a similar view on a larger scale; Figs. 3, 4 and 5 are horizontal sections on the lines 3—3, 4—4, 5—5 of Fig. 2.

In the embodiment of the invention which I disclose in the present application, the apparatus is designed for holes of small diameter and vertical, or nearly so.

The apparatus comprises a jumping drill having a drill shaft of length equal to, or longer than, the maximum stroke of the drill, thus allowing the shaft to follow down, as it bores holes, without disturbing any part of the apparatus.

Referring to the drawing, (Fig. 2) 1 indicates a rope or cable, the lower end of which is pivotally attached, as shown at 2, to a yoke 3 of a frame 4, which is of the form best suited when starting a well. Said frame 4 is provided with diametrically opposite vertically extending guides 6, (Fig. 3) which can slide between vertical guide ways 7, secured on the inner side of a pipe 8, stationarily secured, as by means hereinafter described, within an outer pipe 9, and having at the top inwardly extending brackets 11. The pipe 9 is suspended by a cable 10 and the cables 1 and 10 pass around pulleys 20 (Fig. 1) mounted on a derrick or frame 25. By the engagement of said guides 6 with said guideways 7 the frame 4 is prevented from turning while capable of reciprocating vertically. Extending centrally through said frame 4 is a drill stem 12, having secured to its upper end a collar 13, by which it is rotatably supported upon the frame 4. On the upper end of the stem and contained within the frame 4 is a ratchet wheel 14, which is adapted to be engaged by diametrically opposite spring-actuated pivoted dogs 16 extending from the frame 4.

Said drill stem also extends through a lower frame 17, stationarily secured, as shown at 18, to the pipe 8. Rotatable upon ball bearings 19 on said lower frame 17 is a ratchet wheel 21 (Fig. 5) prevented from rotating in a left-handed direction, (viewed from above) by spring-actuated pivoted dogs 22 carried by the pipe 8. Ball bearings are here used because the lower frame is always wet and muddy.

Below said upper frame 4 said stem is formed with diametrically opposite helical ribs 23, which engage diametrically opposite helically extending grooves 24 in the inner surface of the ratchet wheel 21, when said stem 12 is raised through said frame 4.

On the lower end of the stem is a coupling 26, by which there is coupled to said stem a cutting tool 27, having either a chisel shaped or pointed cutting end, the former being here shown.

The mode of operation of this portion of the apparatus is as follows: Supposing the cable 1 to be given, a downward vertical movement, the upper frame 4 and the stem 12 are reciprocated therewith. On the downward movement the drill stem is turned in a right-handed direction (looking down) by reason of the engagement of the ribs 23 with the grooves 24 in the wheel 21 which is prevented from turning in a left-handed direction by the dogs 22. When the drill stem and the frame 4 move upwardly, the drill stem is prevented from turning in a left-handed direction by the engagement of the dogs 16 with the ratchet wheel 14, and therefore the engagement of the ribs 23 with the grooves 24, causes the wheel 21 to turn in a right-handed direction. In this way, with its vertical reciprocating motion, the stem is given an intermittent rotary motion corresponding in extent with the pitch of the helical ribs 23 and the length of its stroke.

The following is the means above referred to for securing the inner pipe 8 in the outer pipe 9. The pipe 9 is somewhat shorter than the pipe 8, or at least it need not be of greater length. As in Fig. 4, it is split or open longitudinally so as to be capable of

expanding and contracting. On the outside of the pipe 8 is a vertical series of groups of downwardly tapering wedges 31, there being here shown three groups in the series, and four wedges in each group, the wedges of the same group being all in the same horizontal plane. On the inner surface of the outer pipe 9, is a corresponding vertical series of upwardly tapering wedges 32, adapted to engage respectively the corresponding wedges 31. The adjacent edges of the wedges of the two series are vertically grooved, as shown at 33, to prevent them from slipping in a horizontal direction on each other, and to hold in a firm and steady manner the pipe 9 while the drill is operating.

The weight of the pipe and of the drill stem, and the momentum acquired by the drill stem in dropping, imparted to the pipe 8, cause it to descend within the pipe 9, and, as it does so, the wedges 32 of the pipe 9 being the only means for preventing the pipe 8 from dropping entirely through said pipe 9, force the wedges 32 outwardly and expand the pipe 8 and cause it to be firmly embedded in the walls of the well hole being bored. Conversely, to remove the drill and pipes from the well, the drill is raised so that it strikes the brackets 11, shown in Fig. 2, thus raising the tube 8, which in turn, by means of lugs 36, also best shown in Fig. 2, extending outwardly from the pipe 8, raise the pipe 9.

In the construction of this apparatus, care is taken to afford as much vacant space as possible for the water to pass by the drill when it is being raised or lowered in the well.

I claim:

1. In means for boring a well, a vertical split outer tube, an inner tube, means for lowering the inner tube within the outer tube, said tubes having on their opposing or adjacent surfaces means whereby outward pressure is imparted to the outer tube by the descent of the inner tube therewithin said outer tube being automatically contractible when relieved from said outward pressure.

2. In means for boring a well, a vertical split outer tube, an inner tube, means for lowering the inner tube within the outer tube, said outer and inner tubes having on their opposing or adjacent surfaces wedges adapted to engage each other upon the descent of the inner tube within the outer tube, and causing the outer tube to expand and be pressed against the side of the well, said outer tube being made of spring metal and automatically contractible when said wedges no longer engage each other.

3. In means for boring a well, a vertical split outer tube, an inner tube, means for lowering the inner tube within the outer tube, the said outer and inner tubes having on their opposite or adjacent surfaces wedges adapted to engage each other upon the descent of the inner tube within the outer tube, and causing the outer tube to expand and be pressed against the side of the well, the contacting surfaces of said wedges being vertically corrugated, said outer tube being made of spring metal and automatically contractible when said wedges no longer engage each other.

PETER J. GILDEA.