(No Model.)

F. O. BROWN.

APPARATUS FOR BORING ARTESIAN WELLS.

No. 492,536. Patented Feb. 28, 1893.

Fig. 1.

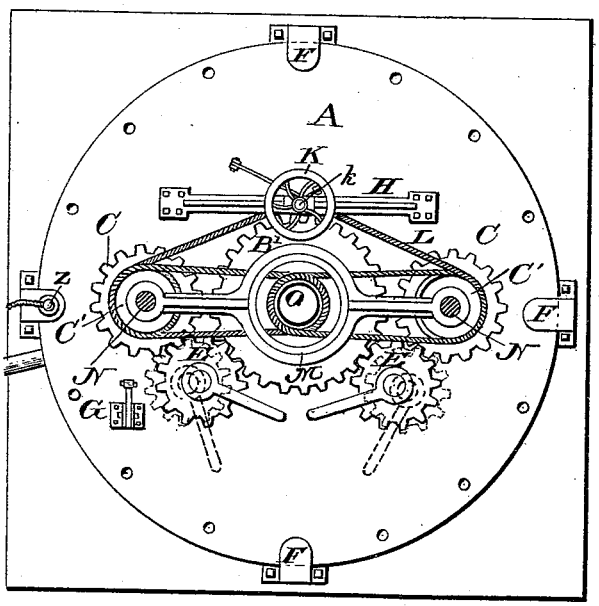


Fig. 3.

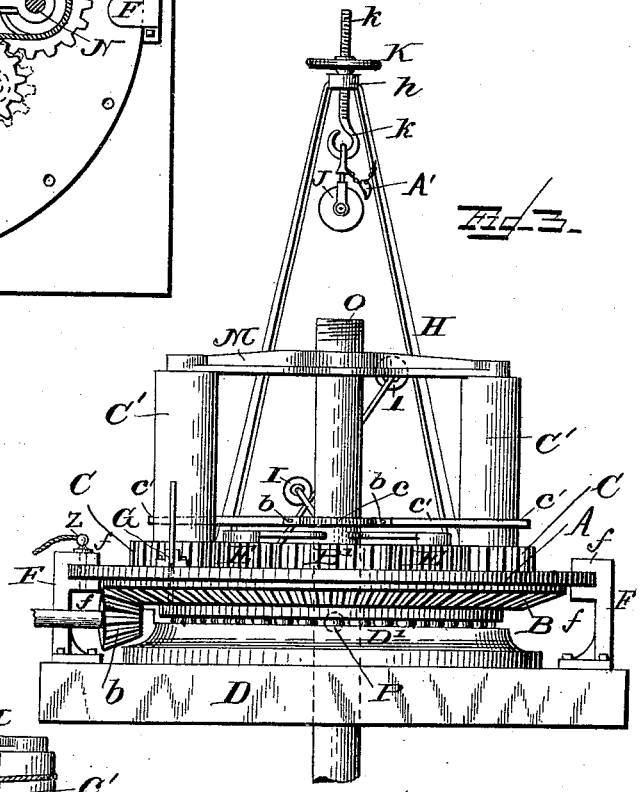


Fig. 2.

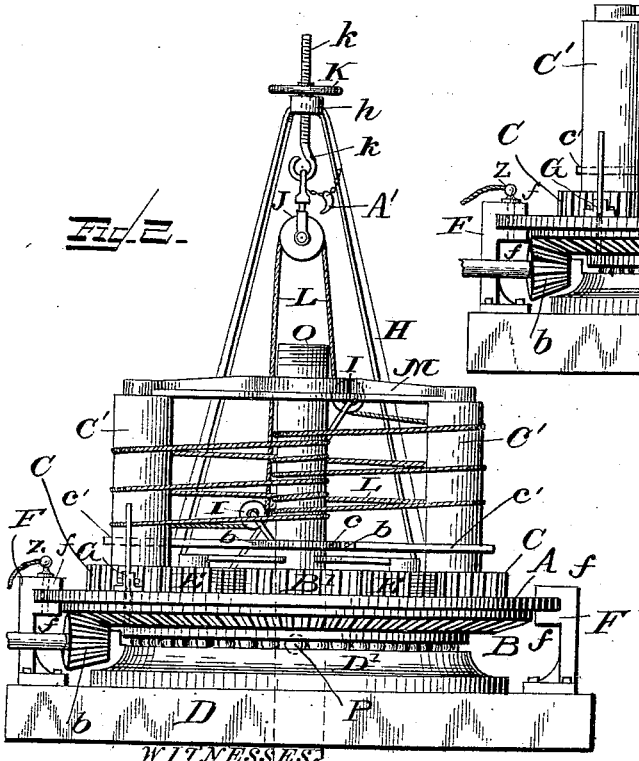
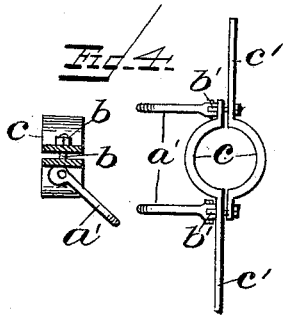


Fig. 4.



WITNESSES:

F. L. Ourand.

E. R. Shipley.

INVENTOR

Frank O. Brown.

By W. S. Boyd, Attorney

UNITED STATES PATENT OFFICE.

FRANK O. BROWN, OF DALLAS, TEXAS.

APPARATUS FOR BORING ARTESIAN WELLS.

SPECIFICATION forming part of Letters Patent No. 492,536, dated February 28, 1893.

Application filed April 6, 1892. Serial No. 428,099. (No model.)

To all whom it may concern:

Be it known that I, FRANK O. BROWN, a citi- of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain Improvements in Apparatus for Boring Wells, of which the following is a specification.

My invention relates to certain improvements in apparatus for boring wells, and the object of my invention is to provide an apparatus for this purpose which shall be simple in its operation and readily adjustable for penetrating substances of various resistances whereby the breaking of the drill head will, to a great extent, be prevented, all as will be more particularly described hereinafter.

In order that my improvements may be the better understood I have illustrated in the accompanying drawings an apparatus embodying my invention, in which drawings—

Figure 1 is a plan view and Fig. 2 is a side elevation of the apparatus, drawn to a small scale. Fig. 3 is a view similar to Fig. 2 showing the use of the clamps for rotating the tube without the ropes shown in Fig. 2, and Fig. 4 is a detail view.

In the views, D represents a heavy bed plate provided with an annular raised facing D′ on its upper side, which facing is grooved and adapted to receive balls P, as seen in Fig. 2, to reduce friction. The bed plate is set upon the ground over the spot where it is desired to operate and has a centrally arranged opening through it for the passage of the tube or "casing" to which the head is secured.

B is a bevel gear wheel having a groove in its lower side corresponding with and fitting over the balls P in the groove in facing D′, as seen in Fig. 2, and *b* is a bevel pinion mounted in bearings (not shown) at one side of the apparatus and meshing with gear wheel B, whereby said wheel may be rotated, said pinion being driven from any source of power, as a whin for instance, also not shown.

A is an annular flat table mounted loosely on a shoulder on wheel B, and having its edge projecting beyond the edge of said wheel and engaging jaws *f* on brackets F secured to the bed plate D, one of said jaws on each bracket lying above and the other below said table whereby said table when rotated, moves between the same, as will be understood by inspection of Fig. 2. Said jaws *f* are provided with perforations and the edges of the table A are likewise correspondingly perforated whereby said table may be locked fast to the bed plate by means of pins Z, inserted through said perforations as shown.

On the boss of wheel B is formed a second gear B′, projecting above the upper surface of the table A and on the upper surface of the table A and on diametrically opposite sides thereof, are mounted upright shafts or arbors N, united by a tie bar M at their tops, on which shafts are mounted toothed gear wheels C, C, the bosses of which are in the nature of drums C′, C′.

E, E, are toothed gear wheels suitably mounted on the upper surface of the table and adapted to be thrown into and out of engagement with the respective gears B′ and C, C, at will for purposes to be hereinafter set forth.

H is a frame of inverted V-shape, mounted on the table A and bearing at its apex a hook *k*, having a screw threaded shank passing through a collar *h* on said frame and engaging a hand wheel K, thereabove, whereby the height of said hook above table A may be regulated.

J is a block mounted on said hook and L is a wire rope or chain, passing over the sheave of said block and down on each side of the same, taking under sheaves I, I, secured on arms projecting upward from table A. Thence said rope L passes, in opposite directions to and around the respective drums C′ on each side of the table.

O represents the tube or casing to which the drill head is secured and to which it is desired to impart a downward as well as rotary movement, and this tube passes through co-inciding openings formed in wheel B and bed plate D, which openings should be of sufficient size or diameter to admit of the passage therethrough of the couplings employed for connecting the several pipe sections.

From the respective drums C′, C′, the rope L passes, in opposite directions, about the tube O, as seen in Fig. 2, and back again to the drum C′ on the opposite side of said table. As shown, three strands of said rope are em-

ployed on each side of the apparatus but the number of strands is unimportant and may be varied according to circumstances, depending on the substance to be operated on, and consequent resistance tending to cause slipping of the rope on said tube O.

The method of operating the apparatus is as follows:—The apparatus having been set in place for operation, the tube O, with the drill head is secured in place and the ropes passed around the same and the drums and pulleys. The slack is then taken up by means of the hand wheel and screw on hook *k* after which rotary motion is imparted to the gears *b*, B, and table A, said table being locked fast to said gear wheel B by means of a bolt G, engaging corresponding sockets in the respective parts. The rotary motion of the apparatus is continued until the lowest turn of the rope L about tube O has reached the level of the gears C, when the latch G is thrown out of engagement with gear B and the pin Z is inserted through the openings in jaws *f* and table A. The gears E are then thrown into engagement with gears B′ and C when the table A will remain stationary and rotary motion will be imparted to drums C′ and through the rope thereabout to tube O, the wire rope L in this case however, rising on the tube at each revolution of the same, as will be understood. In the operation of the apparatus, the rope rises on tube O at each revolution, the amount of its diameter, less the distance the pipe has been forced into the earth, and in operating in ordinary soft material these two items will be about equal and as long as this condition remains, the operation as last described may be continued. But should the tube not enter the earth sufficiently fast, from the resistance offered thereto, or any cause, the rope ascends on the pipe and drums to near the top of the latter when the table A will be again loosened from brackets F, gears E thrown out of engagement as shown in dotted lines in Fig. 1, said gears being eccentrically journaled in the table A in any well known manner and bolt G dropped into the socket in gear wheel B, when the first described method will be resumed until the rope has traveled down again the necessary slack being given and taken up as the rope travels up and down by means of hand wheel K. Slack should also be given to admit the passage of the couplings through the apparatus.

In order to provide against back rotation of tube O, when the apparatus is stopped from any cause, I prefer to provide the block J with a chock or wedge-shaped block A′, as seen in Fig. 2, which can be placed between the top of the block J and the rope and thus stop the passage of the rope through the block in the well known manner.

In operating upon very hard substances, there is a constant tendency for the rope L to slip and to prevent this, as well as to remove undue strain therefrom, I provide a clamp as seen in Fig. 4, which consists of two halves or sections *c*, having bolts *b*′ headed on one side thereof and passing through the ends thereof to the ends of which bolts are coupled slotted cam levers *a*′, *a*′, as clearly seen in said view. The sections *c*, have arms *c*′, which, when the device is in place about the tube O, project laterally and engage with the drums C′, C′, on each side of the apparatus so that when the sections are clamped fast to the tube or casing said tube will be rotated positively from table A, without recourse to rope L in driving.

I do not wish to be understood as limiting myself to the precise construction and arrangement of the various parts shown herein for carrying my invention into practice, as it is evident that many alterations may be made therein without material departure from the principles thereof.

Having thus described my invention, I claim—

1. The combination with a bed plate, of the drill tube or casing, drums mounted on said bed plate on opposite sides of said drill tube, means for driving said drums, and means for rotating said tube from said drums, substantially as set forth.

2. The combination with a bed plate, of the drill tube or casing, drums mounted on said bed plate on opposite sides of said drill tube, means for driving said drums, a wire rope or chain passing about said drums and the drill tube and means for taking up and giving slack in said rope, substantially as set forth.

3. The combination with a bed plate, of the drill tube or casing, drums mounted on said bed plate on opposite sides of said drill tube, means for driving said drums, and an endless wire rope passing about both of said drums and the drill tube, substantially as set forth.

4. The combination with a bed plate, of the drill tube or casing, drums mounted on said bed plate on opposite sides of said drill tube, a sheave mounted on said bed plate, means for driving said drums, a wire rope passing about said drums and the drill tube, and about said sheave, means for varying the position of said sheave for giving or taking up slack, and a stop device for preventing back rotation of said tube, substantially as set forth.

5. The combination with a bed plate, of an annular gear wheel journaled thereon, means for rotating said gear wheel, the drill tube or casing arranged within said gear, drums mounted on said bed plate on opposite sides of said tube means for driving said drums from said gear wheel and means for driving said drill tube from said drums, substantially as set forth.

6. The combination with a bed plate, of an annular gear wheel journaled thereon, means for rotating said gear wheel, the drill tube or casing arranged within the gear, drums mounted on the bed plate on opposite sides of said drill tube, means for driving said drums from said gear wheel, an endless wire

rope passing about said drums and the drill tube and means for taking up and giving slack in said rope, substantially as set forth.

7. The combination with a bed plate, of an annular gear wheel journaled thereon, means for rotating said gear wheel, the drill tube arranged within said gear, a table loosely mounted on said gear, means for locking said table fast to the bed plate, drums arranged on opposite sides of said table, means for driving said drums from said gear wheel, and means for driving said tube from said drums, substantially as set forth.

8. The combination with a bed plate, of an annular gear wheel journaled thereon, means for rotating said gear wheel, the drill tube arranged within said gear, a table loosely mounted on said gear, means for locking said table fast to said gear wheel, drums arranged on opposite sides of said table and means for driving said tube from said drums, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK O. BROWN.

Witnesses:
W. P. McFAULL,
R. K. DABNEY.