No. 716,062.

Patented Dec. 16, 1902.

R. L. LANDRY.

WELL BORING DEVICE.

(Application filed Feb. 1, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

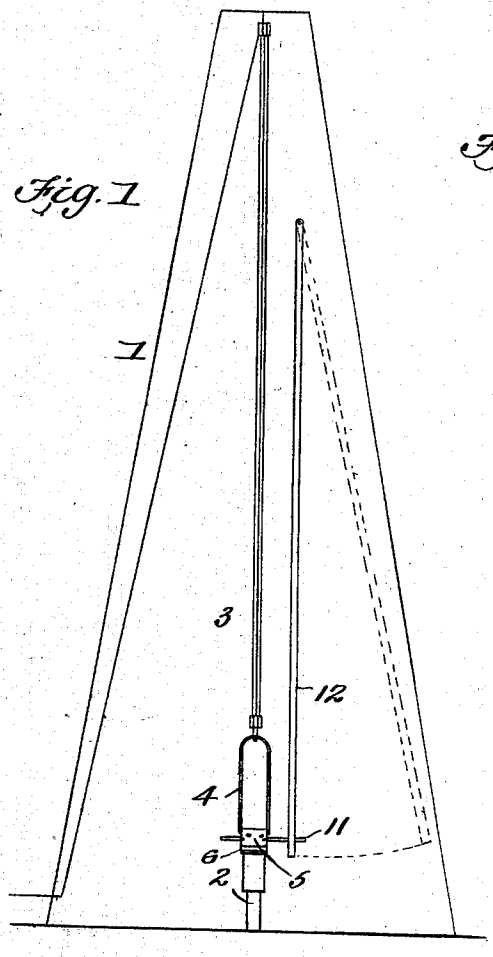

Fig. 2.

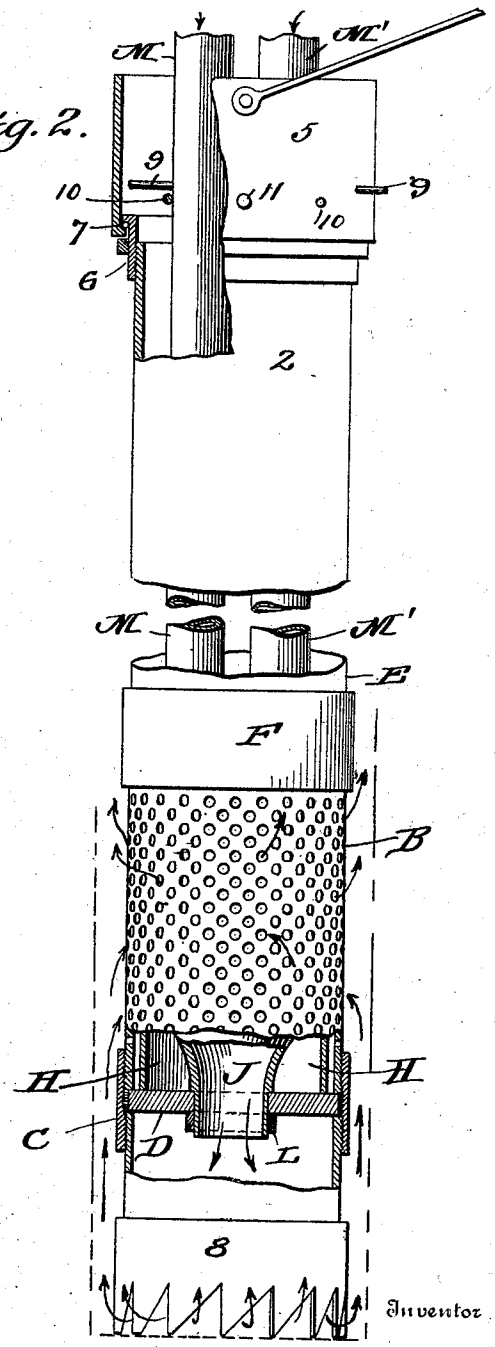

Fig. 3

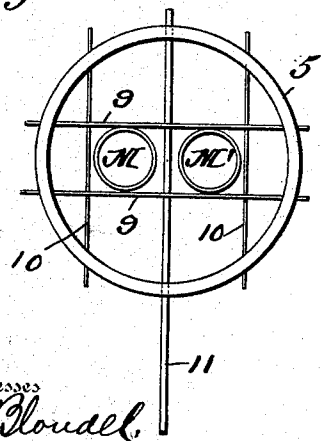

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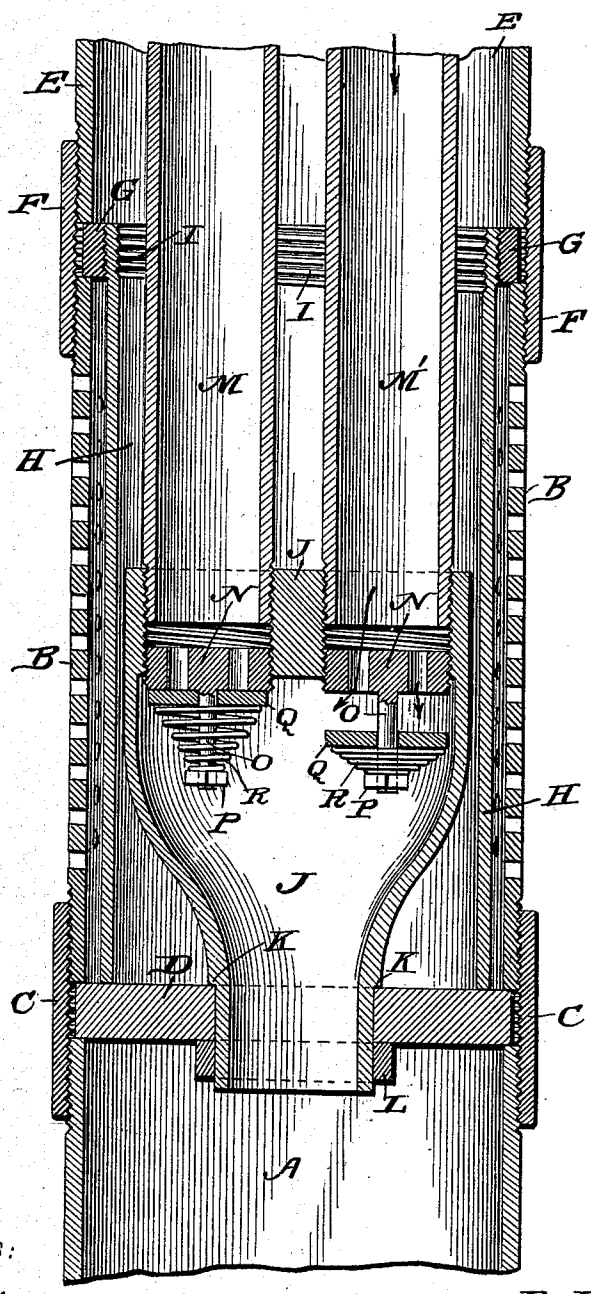
Fig. 4.



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UNITED STATES PATENT OFFICE.

ROSAMOND L. LANDRY, OF WHITECASTLE, LOUISIANA.

WELL-BORING DEVICE.

SPECIFICATION forming part of Letters Patent No. 716,062, dated December 16, 1902.

Application filed February 1, 1901. Serial No. 45,533. (No model.)

To all whom it may concern:

Be it known that I, ROSAMOND L. LANDRY, a citizen of the United States, residing at Whitecastle, in the parish of Iberville and State of Louisiana, have invented a new and useful Well-Boring Device, of which the following is a specification.

This invention relates to improvements in apparatus for boring wells; and the object thereof, generally stated, is to provide an improved construction whereby wells may be more rapidly and conveniently bored and at less expense than is possible with the apparatus now in general use.

The objects of my invention, more specifically stated, are as follows: first, to provide a construction whereby a continuous flow of water may be maintained while connecting additional sections of pipe or tubing as the drilling of the well progresses; second, to provide means for preventing the return of water through the strainer and thence upward upon the inside of the well-tubing; third, to provide a seal for the bottom of said tubing or well; fourth, to so construct the apparatus that the various parts may be conveniently removed when the well is of sufficient depth, and, fifth, to provide for the continuous flow of water upon the outside of the well in an upward direction for the purpose of preventing sticking of the boring-tool.

I accomplish the above-specified objects by means of the construction and arrangement of parts, which will be hereinafter fully set forth, particularly pointed out in the claims, and clearly illustrated by the accompanying drawings, in which the same reference characters indicate corresponding parts in each of the views in which they occur.

Figure 1 is an elevation of a well-derrick and the top of the casing. Fig. 2 is a broken elevation, partly in section, of the casing. Fig. 3 is a top plan view of the casing. Fig. 4 is an enlarged longitudinal sectional view of a portion of the casing provided with my improvement.

Referring now more particularly to the drawings, 1 indicates a derrick, which may be of any ordinary construction and by means of which the well-casing 2 is partially supported and manipulated. The casing is preferally suspended from the ropes 3 by means of a bail 4, which may be pivotally secured to a collar 5. The collar can be secured to the top of the casing in any desired manner, as by collar 6 and ball-bearings 7, the collar 6 being removably secured to the top of the casing, as by ordinary screw-threads. A suitable boring-tool or cutter 8 is secured to the lower end of the casing, which will cut a cylindrical channel as the casing is rotated by means of a lever or pipe-wrench (not shown) applied to the upper end of the casing below the ball-bearing and operated by an attendant.

A designates the nipple, to which the boring-tool is attached and which is connected with a strainer B by means of a coupling-sleeve C. Positioned between the meeting edges of the strainer B and the nipple A is a diaphragm D, which is of a sufficient diameter to close the inside of the well in which it is positioned and which is provided with a centrally-disposed opening. This diaphragm is firmly clamped in position by the coupling-sleeve, which holds the lower end of the strainer B and the upper end of the nipple A in contact therewith.

The upper end of the strainer B is connected with the lower end of one of the sections E of the well pipe or tubing by means of a coupling-sleeve F, and placed between the upper end of the strainer and the lower end of well-pipe E is a collar G, provided with a left-hand thread.

A shield H is provided, which is disposed upon the inside of the strainer and has its walls separated from the walls of the latter, as clearly illustrated. This shield is threaded into the collar G at its upper end, and at its lower end rests upon the upper surface of the diaphragm D. By the use of said shield water is positively prevented from passing through the strainer to the interior of the well-tubing, and hence must pass upwardly upon the outer side thereof. Said strainer at its upper end is also provided upon its interior with screw-threads I.

Positioned upon the interior of the shield is a reducer J, which has its lower end of a diameter to fit in the center opening formed in the diaphragm D. Said reducer is formed with a shoulder K, which is disposed upon the upper surface of the diaphragm and carries

upon its lower end, which projects through the opening in said diaphragm, a collar L. Thus the reducer is prevented from moving longitudinally, but is loosely supported by the diaphragm, which as the well is bored revolves thereabout.

The reducer is enlarged at its upper end to nearly the same diameter as the interior diameter of the shield and has said upper end closed and formed with two perforations, which are screw-threaded. Screwed into these perforations at their lower ends are sections M and M′ of the water-supply pipes, which pipes at their upper ends are connected with the pumping mechanism which supplies water to the well. These flow-pipes M and M′ are secured to the reducer by a left-hand thread.

Threaded into the top wall of the reducer and at the lower ends of pipes M and M′ are diaphragms N, which have centrally depending therefrom into the reducer stems O, screw-threaded upon their lower ends to receive nuts P. Said diaphragms N are provided with openings through which communication is established between the pipes M and M′ and the reducer, and said openings are controlled by downwardly-movable valves Q, which are centrally perforated to move freely upon stems O and which are normally held to the seats by springs R, disposed between the under side of the valves and the nuts P. The valves are unseated against the tension of these springs when water is forced through the pipes by the pumping mechanism.

When it is desired to add a section of pipe both to the main pipe and to the water-supply pipes, the same may be accomplished without stopping the flow of water. This is effected with reference to the water-supply pipes in the following manner: The supply of water is shut off to one of the pipes—say pipe M. As soon as this is done valve Q is forced upwardly by its spring, shutting off communication between said pipe and the reducer. The flow of water is continued through the other pipe M′, and said water is prevented from passing upwardly through pipe M by said valve Q. A section of pipe may then be added to pipe M and the flow of water through said pipe continued, said flow being stopped through pipe M′, to which a section may be added, as described in reference to pipe M. Thus additional sections of pipe may be added to the water-supply pipes and to the well-tubing without stopping the flow of water.

The pipes M and M′ may be supported in any desired manner; but I prefer to insert cross-pieces 9 and 10 through the collar 5, so as to form squares, through the central ones of which the upper ends of the pipes may project, as shown in Fig. 3. The end of one of the cross-pieces is extended to a suitable distance beyond the collar, as shown at 11, and is adapted to hold the collar against rotation by engaging with a rod 12, said rod being pivotally secured near the top of the derrick, so as to be removed from engagement with the cross-piece when it is desired to disconnect the collars from the top of the casing for the purpose of adding additional lengths of pipe or casing.

In operating my improved well-boring apparatus the parts are assembled as above described and water is forced down through the pipes M and M′ as the casing is rotated, which passes down and out under the cutter at the lower end of the casing and is forced up to the top of the ground around the exterior of the casing and carries with it the borings from the tool, and where the material within the casing is not too hard it will also be carried out with the water.

The use of the shield and the diaphragm prevents any water from returning to the interior of the tubing and causes the same to pass upwardly on the outside of said tubing, thereby permitting the apparatus to turn freely and obviate any possibility of the sticking of the same in the earth.

After the well has been bored a sufficient depth the pipes M and M′ are disconnected from the pump and are removed from the reducer J, leaving said reducer with the valves at the bottom of the well, sealing the same. The shield is then removed by inserting a plug, which is threaded to fit the thread I upon the shield. With the removal of the shield the well is completed. It will be seen that I have provided an automatic seal for the bottom of the well which consists of the reducer, with its valves, and the diaphragm D.

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

1. In a well-boring apparatus, the combination with the well-tubing, of a reducer positioned in said tubing and means for supporting said reducer and provided with a valved inlet at its upper end, and a water-supply pipe attached to said reducer at said inlet, substantially as described.

2. In a well-boring apparatus, the combination with the well-tubing, of a reducer positioned upon a support within the interior thereof and having a swiveled connection with the support and provided at its upper end with a valved inlet, and a water-supply pipe removably attached to said reducer at said inlet, substantially as described.

3. In a well-boring apparatus, the combination with a well-tubing, of a coupling supported therein by a diaphragm and having a swiveled connection therewith and provided at its upper end with an inlet, a downwardly-opening spring-actuated valve controlling said inlet, and a water-supply pipe removably attached to said coupling at said inlet, substantially as described.

4. In a well-boring apparatus, the combination with the well-tubing, of a diaphragm rigidly supported upon the interior thereof and formed with a central opening, a reducer swiv-

eled in said opening and provided at its upper end with an inlet, a valve controlling said inlet, and a water-supply pipe attached to said reducer at said inlet, substantially as described.

5. In an apparatus for boring wells, the combination with the well-tubing, of a diaphragm secured therein and formed with a central opening, a reducer swiveled in said opening and having an enlarged upper end formed with inlets, valves controlling said inlets, and water-supply pipes attached to said reducer at said inlets, substantially as described.

6. In a well-boring apparatus, the combination with a well-tubing carrying a strainer and an interiorly-mounted shield, of a diaphragm having a central perforation located within the tubing near its lower end, and adapted to support the said shield, of a reducer within said tubing and supported by said diaphragm, and an inlet to said reducer at its upper end, and an outlet at its lower end.

7. In a well-boring device, the combination with the tubing, the strainer and the shield, of a diaphragm located within the tubing near its lower end, and having a central opening, a reducer passing through the opening, and having shoulders adapted to rest on the edge of the said openings, and a plurality of valved pipes connected to the upper end of said reducer, and adapted to convey a supply of water to the lower end of said boring apparatus.

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