A. DE BRETTEVILLE.

WELL DRILLING IMPLEMENT.

APPLICATION FILED NOV. 24, 1911.

1,138,188.

Patented May 4, 1915.

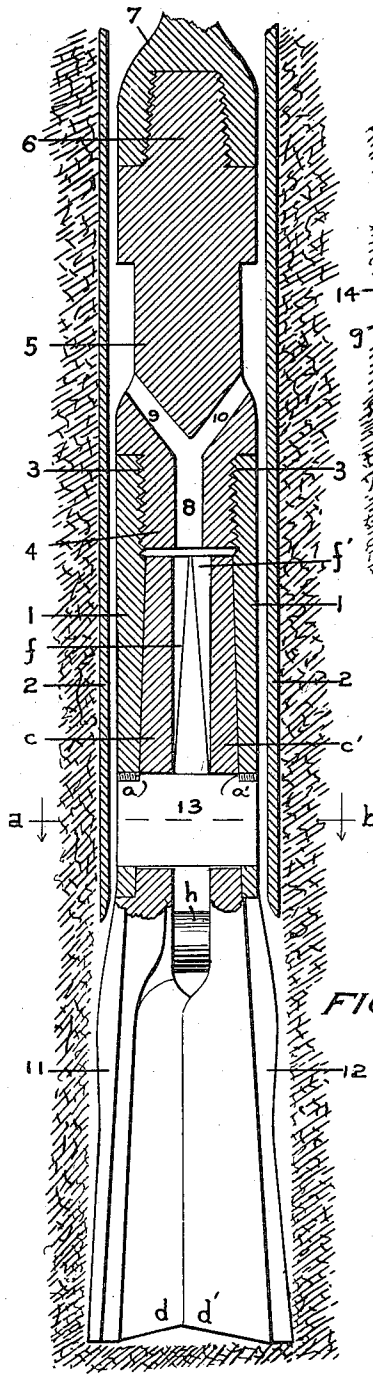

FIG. 1

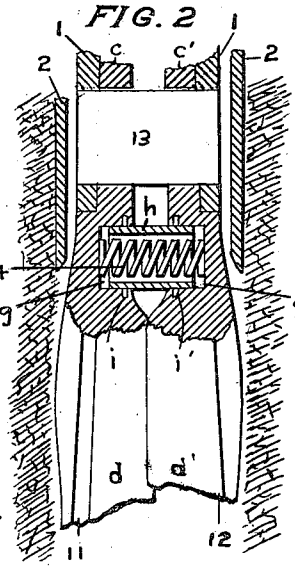

FIG. 2

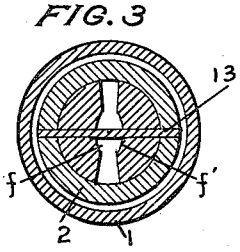

FIG. 3

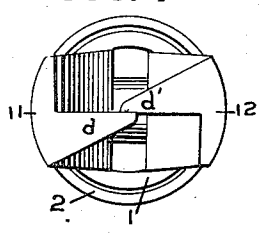

FIG. 4

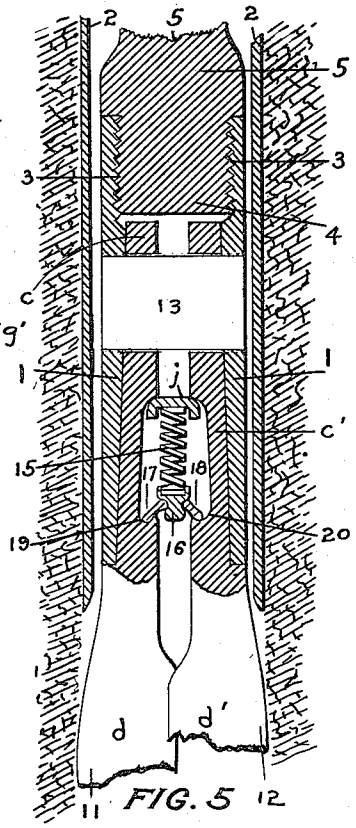

FIG. 5

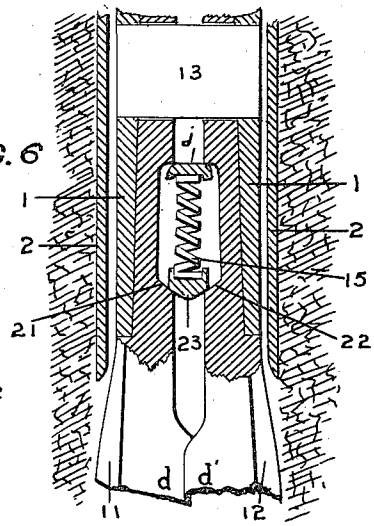

FIG. 6

WITNESSES

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UNITED STATES PATENT OFFICE.

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WELL-DRILLING IMPLEMENT.

1,138,188. Specification of Letters Patent. Patented May 4, 1915.

Application filed November 24, 1911. Serial No. 662,203.

To all whom it may concern:

Be it known that I, ALEXANDER DE BRETTEVILLE, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Well-Drilling Implements, whereof the following is a specification.

My invention relates to the art of boring wells, and especially to tools for drilling the same, and it has for its object to provide in that class of implements new and improved means for expanding said tool in order to drill a hole below the casing larger than the outside diameter thereof, and being contractible permit the same to be easily inserted and withdrawn from the casing.

With this purpose in view, and other objects which will appear in the following specification, my invention consists in a shell of a size adapted to slide easily in the casing, a cap adapted to screw into said shell, and to engage the screw-head of the drill-rod, drill members secured to said shell, having arms extending into said shell and blades extending below the same, and springs for expanding the blades below the bottom of the casing.

It also consists in the novel parts, combinations and arrangements, described in the following specifications particularly pointed out in the claims, at the end hereof, and illustrated in the accompanying one sheet of drawing in which;

Figure 1, is a view in elevation of my novel well-drilling-tool, partly in section; Fig. 2, is a detail view of the expanding spring and adjacent part; Fig. 3, is a sectional view taken along the line *a b* of Fig. 1, looking in the direction of the arrows; Fig. 4, is an inverted plan view of the tool; Fig. 5, is a fragmentary view, showing a modification of the blade expanding means; and Fig. 6, is a view similar to Fig. 5 showing another modification of the blade expanding means.

The same numeral of reference marks the same part in whichever view it may appear.

Describing my invention in detail, 1 is a cylindrical shell having a tapered inner side and of a diameter which allows it to slide easily in the well casing 2. The upper part is internally threaded as at 3, to receive the screw 4 of the cap 5, which is adapted to be screwed into the shell 1 and has a screw 6 at its top for engaging the internally threaded head 7 of the drill rod. The screw 4 is provided with a central duct 8, which communicates with two lateral ducts 9 and 10.

Drill members 11 and 12, forming the bit, are secured to shell 1 by means of a key 13 passing through registering slots in said shell and said members, and secured in position by means of screws *a* and *a'* engaging the shell and the key. Each member is alike and consists of tapered arms *c* and *c'*, extending above said key within the inner tapered side of the shell, and containing the slot through which said key passes; and of blades *d* and *d'*, extending below said key and below the bottom of said shell. The arms *c* and *c'* are provided with internal longitudinal grooves *f* and *f'*, which register to form an opening centrally located and extending from the bottom of the arms to the top, and registering with the central duct 8 of the screw 4. The utility of said opening, with the central and lateral ducts consists in their forming a passage for the escape of any dirt that may find its way upward between the blades. Of course the opening aforesaid is not intended for the passage of all the dirt loosened by the blades; the mass of loosened dirt is intended to be removed in the usual way by sand pump or otherwise, but it is intended to remove such dirt as may enter the drill and tend by its presence to interfere with the expansion and contraction of the drill members.

In the preferred form of my spring 14, I provide chambers *g* and *g'* in blades *d* and *d'* and in which the ends of the spring 14 are placed so as to expand against said blades tending to push them apart. A covering *h* protects the spring from external interference, as the dirt above referred to; and grooves as shown exclusively in Fig. 2 are provided in the blades in which packing rings *i* and *i'* are placed about said covering, thus preventing dirt from entering the chamber *g* and *g'* inclosing the spring.

As to the modifications of the expanding means shown in Fig. 5 the slots and key 13 are located at a point nearer the upper extremity of the arms, *c* and *c'* and a spring 15 disposed vertically is seated at its upper end against cup shaped piece *j* set in arms *c* and *c'*. At the lower end of said spring is a stirruplike piece 16 to which are flexibly attached toggles 17 and 18, which lie in notches 19 and 20 formed in blades *d* and *d'* thus transmitting the downward pressure

of the spring into expansive pressure against the blades.

In the modification shown in Fig. 6, the spring 15 is also vertically disposed and its upper end seated in the manner above described, but the blades are provided with inclined planes 21 and 22 and block 23 is fixed at the lower end of spring 15 and rests upon said inclined planes. Thus constructed, the downward pressure of the spring drives the block down the inclined planes and pushes the blades apart.

Attention is called to the key 13, which is made thin enough to leave space in the central longitudinal opening for the upward passage of the dirt.

When the blades pass below the bottom of the well-casing, the spring expands them, and the drilling produces a hole, large enough to receive the casing readily. When drawn upwardly the curved outline of the blades passes inside the casing, which contracts the spring and allows the drill to be drawn upwardly without difficulty.

Having described my invention what I claim as new and desire to secure by Letters Patent of the United States, modifications within the scope of the claims being expressly reserved is:

1. In a well drilling tool, a cylindrical shell, an expansible bit having tapered arms in said shell, provided with internal longitudinal grooves and a spring for expanding said bit.

2. A well drilling tool, comprising a shell having a cap secured thereon provided with passages, a bit consisting of two expansible blades, having tapered arms located in said shell and provided with internal longitudinal grooves, connected with said passages and a spiral spring between said blades for expanding the same.

3. A well-drilling tool, provided with a pair of expansible members, having a spring secured therebetween for expanding the same, a covering for said spring and packing for said covering.

4. A well-drilling tool provided with a pair of expansible members having chambers provided with annular grooves, a spring located in said chambers, a covering about said spring and packing-rings in said grooves surrounding said covering.

5. In a well-drilling tool, the combination with a shell, of a pair of drill-members having arms secured within said shell, and having a central longitudinal opening in said arms, and a cap having a central duct registering with said opening and provided with lateral ducts leading outwardly from said central duct.

6. A well-drilling tool a cylindrical shell having slots, a pair of drill members having tapered arms extending into said shell, said arms being provided with slots cut through their diameter and registering with said shell-slots, and a flat key for securing said arms to said shell.

7. A well-drilling tool comprising a cylindrical shell having slots, a pair of drill members having tapered arms extending into said shell and slots cut through their diameter and registering with said shell-slots, a key adapted to fit said slots for securing said arms in said shell, expansible blades integral with said arms extending below said shell, and a coil spring for expanding said blades.

In testimony that I claim the foregoing I have hereto set my hand in the presence of witnesses, this 17th. day of Nov. 1911.

ALEXANDER DE BRETTEVILLE.

Witnesses:
BLANCHE CHESTER,
ILSE NIES.