No. 860,115. PATENTED JULY 16, 1907.

R. C. BAKER.

WELL CASING SHOE.

APPLICATION FILED APR. 22, 1907.

Fig. 1.

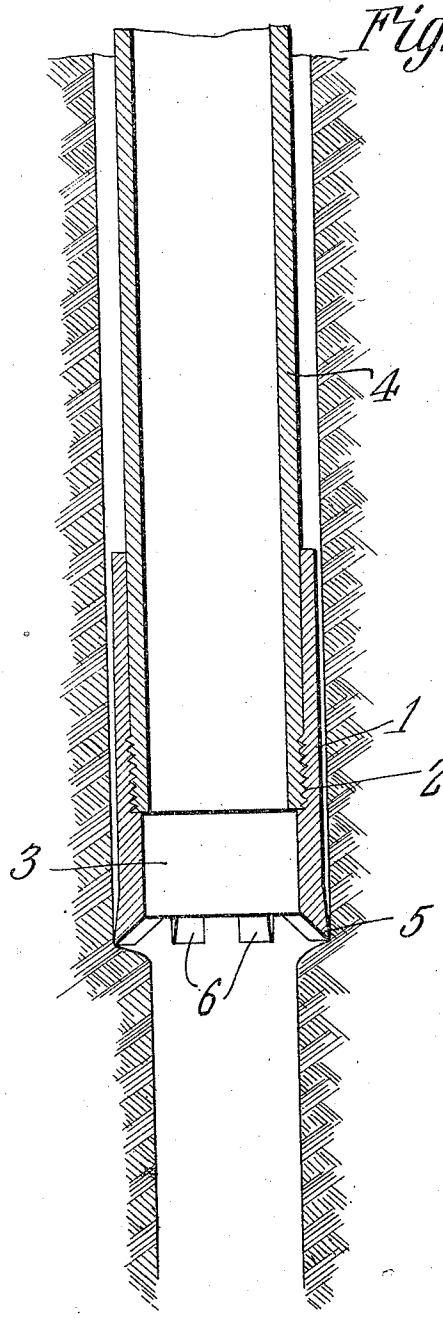
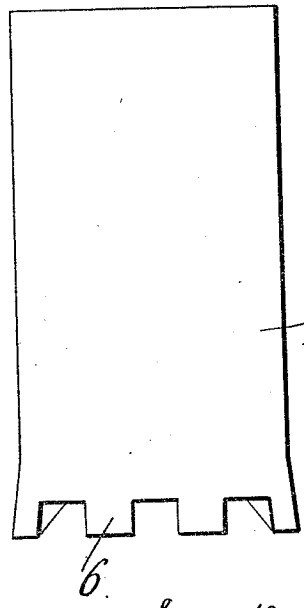


Fig. 2.



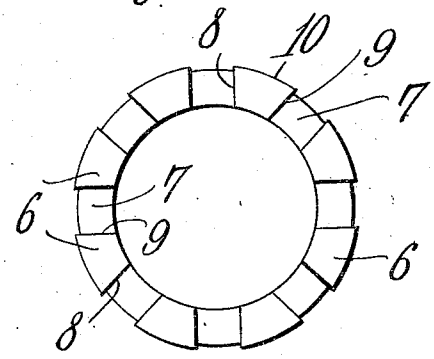


Fig. 3.

WITNESSES:

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REUBEN C. BAKER, OF COALINGA, CALIFORNIA.

WELL-CASING SHOE.

No. 860,115. Specification of Letters Patent. Patented July 16, 1907.

Application filed April 22, 1907. Serial No. 369,588.

To all whom it may concern:

Be it known that I, REUBEN C. BAKER, a citizen of the United States, residing at Coalinga, in the county of Fresno and State of California, have invented a new and useful Well-Casing Shoe, of which the following is a specification.

This invention relates to improvements in apparatus for drilling Artesian wells, and it has for its object to provide an improved shoe or tool adapted to be attached to the well casing or the boring tube, and having a series of cutters thereon adapted to operate on the walls of a relatively small bore, such as is formed by the usual boring tool, and enlarge it to receive the well casing, the cutters on the shoe or tool being so shaped as to afford sufficient clearance between the bore and the casing to permit the latter to be readily introduced in the well, the construction of the device being such that it may be made at a small cost.

To these and other ends, the invention comprises the various novel features of construction and arrangement of parts, which will be hereinafter more fully described and pointed out particularly in the claims appended hereto.

In the accompanying drawing:—Figure 1 is a sectional view of the lower end of the well casing having a boring shoe or tool thereon constructed in accordance with the present invention. Fig. 2 is a side elevation of the shoe. Fig. 3 is a bottom plan view thereof.

Corresponding parts in the several figures are indicated throughout by similar characters of reference.

The shoe or tool shown in the present embodiment of my invention is adapted to be attached to the lower end of the well casing when the latter is operated as a part of the boring apparatus, or it may be attached to the usual boring tube, and it is employed for the purpose of reaming or enlarging the bore formed by the ordinary boring tool or chisel, thereby sizing the well bore to receive the well casing.

The shoe or tool shown in the present instance is composed of a substantially cylindrical shell 1, made of tool steel or other suitable material and is provided with suitable means for attaching it to the well casing or other operating part, the means shown in the present instance embodying screw threads 2 formed on the interior of the shell at a point intermediate its ends, and toward the lower end of the shell is formed an annular shoulder 3 which projects inwardly from the bore of the shell and is adapted to coöperate with the lower end of the well casing or operating part 4 as a stop whereby forces acting longitudinally of the part will be positively transmitted to the shoe or tool and the shoulder serves as a stop to prevent the casing or other part from becoming too tight on the screw threads, especially when a relative rotary movement is transmitted between the well casing, or other part, and the shoe or tool. This shoulder also provides a relatively thick portion on the shell on which the cutters are formed; and the lower end of the thickened portion of the shell is flared outwardly, as at 5. The cutters employed in the present instance embody a series of concentrically arranged teeth 6 that are of substantially prismatic form, and those shown in the present instance may be readily formed by milling a series of slots 7 radially of the shell, forming front and rear cutting edges 8 and 9, and the inner sides of the teeth are beveled to form a lower cutting edge 10 at the lower end of the shell, the flared form of the shell causing the outer cutter edges 10 to project beyond the outer wall of the shell, and in operation serves to afford ample clearance for the body of the shell and the well casing.

The shoe or tool shown in the present instance is operated by a combined longitudinal and rotary movement of the well casing or other operating part of the apparatus, the cutters constituting a series of chisels that serve to chip away the rock or other material forming the walls of the bore, the material removed being carried to the center of the bore or tool from which point it may be removed by means of an ordinary bail or by means of a suction or pressure lifting mechanism, as may be desired. In many cases, it is preferable to permanently attach the shoe or tool to the lower end of the well casing, the sections of the casing being added as the boring operation progresses, and the shoe or tool remains in position at the bottom of the well, the construction shown being relatively simple so that the devices may be used at a small cost. The flared form of the shell at the point where the cutters are formed insures a sufficient clearance between the bore of the well and the exterior of the well casing, as will permit the unions or other joints employed to pass into the well bore without liability of its becoming caught, so that the operation of applying the well casing is facilitated.

What is claimed is:—

1. A well boring tool of the character described, embodying a shell adapted for attachment to a suitable operating part and having its lower end flared, and a series of cutters formed on the flared portion of the shell.

2. A well boring tool of the character described embodying a shell adapted to be attached to a suitable operating part, the lower end of the shell being flared outwardly and beveled at its inner side, and a series of circularly arranged cutters having cutting edges formed on the flared portion of the shell.

3. A well boring tool of the character described embodying a shell adapted to be attached to a suitable operating part, the lower portion of the shell being provided with

a shoulder extending around the inside thereof, the lower portion of the shell being flared outwardly and provided with a beveled surface extending inwardly from the flared portion, and a series of circularly arranged cutters formed on the flared portion of the shell.

4. A well boring tool of the character described, embodying a substantially cylindrical shell having its lower end flared outwardly, an annular shoulder formed at the lower portion of the shell, threads formed in the bore of the shell at a point above the shoulder and adapted to cooperate with a correspondingly threaded end of the well casing, the lower end of the shell being beveled inwardly from the flared portion and provided with substantially radial slots forming a series of cutters on the lower flared end of the shell.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

REUBEN C. BAKER.

Witnesses:
J. F. LACEY,
H. HENSHAW.