

No. 735,770.

PATENTED AUG. 11, 1903.

P. HIGGINS.
REAMER FOR DEEP WELLS.
APPLICATION FILED DEC. 18, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 1.

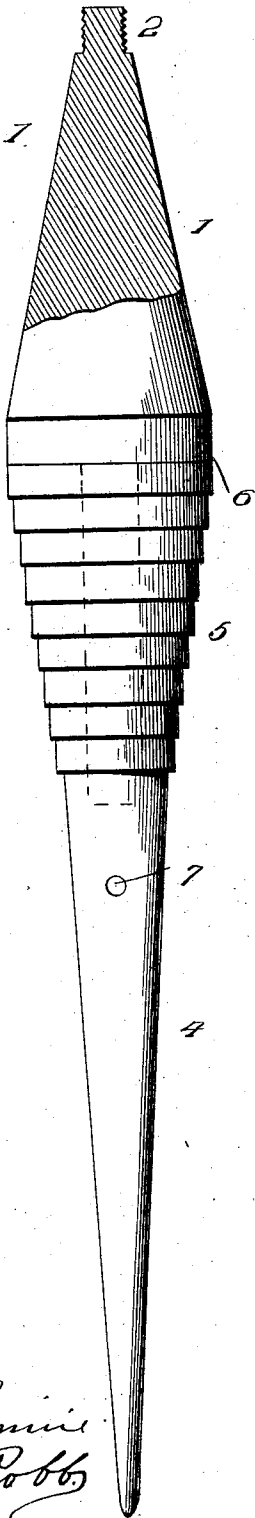
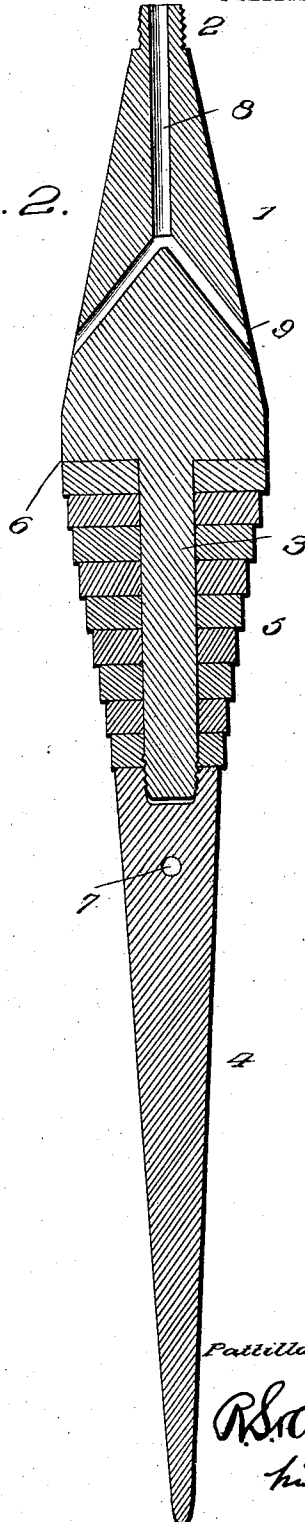


FIG. 2.



Witnesses

J. M. Emie
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By

Inventor

Pattillo Higgins

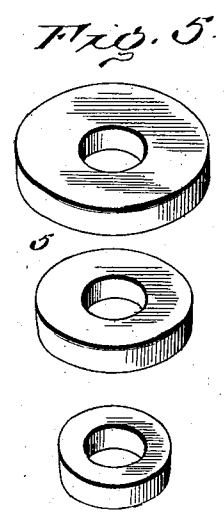
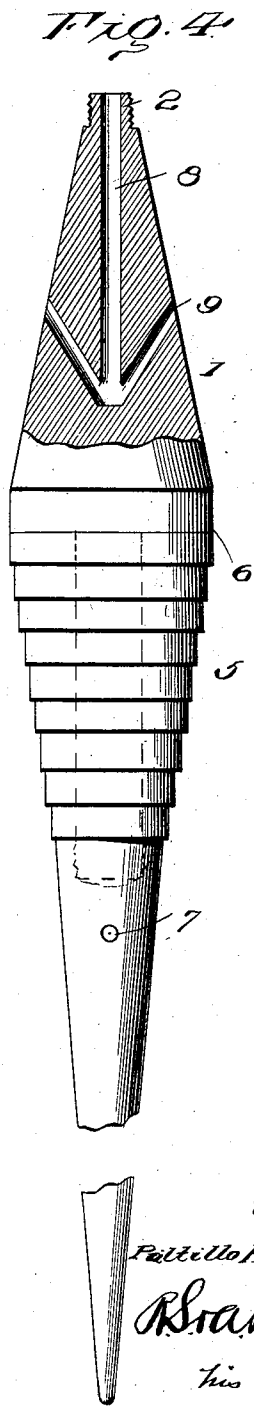
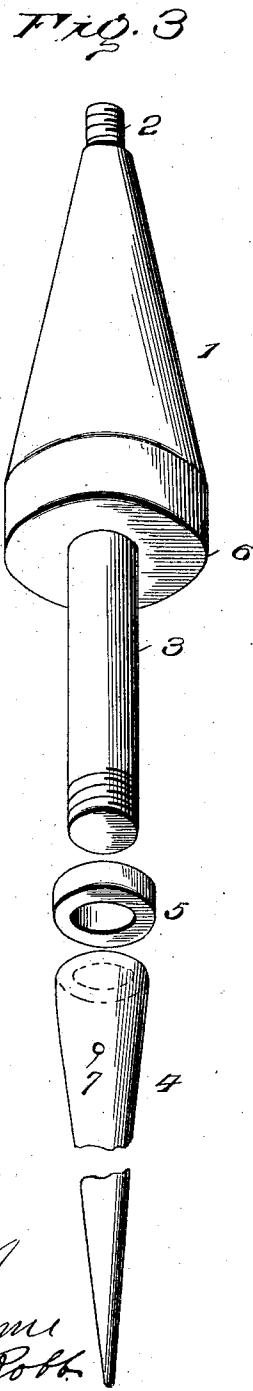
R. B. Dacey

his Attorney.

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REAMER FOR DEEP WELLS.
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NO MODEL.

2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

PATTILLO HIGGINS, OF BEAUMONT, TEXAS.

REAMER FOR DEEP WELLS.

SPECIFICATION forming part of Letters Patent No. 735,770, dated August 11, 1903.

Application filed December 18, 1902. Serial No. 135,817. (No model.)

To all whom it may concern:

Be it known that I, PATTILLO HIGGINS, a citizen of the United States, residing at Beaumont, in the county of Jefferson and State of Texas, have invented certain new and useful Improvements in Reamers for Deep Wells, of which the following is a specification.

This invention provides a reamer for enlarging the bore of wells by progressive action at one and the same operation, the reamer embodying a series of cutting-shoulders arranged in progressive order and increasing in diameter from point to head, the cutting-shoulders being bits of annular formation and strung upon the stem of the reamer-head and reversible to admit of new edges being brought into working position when the exposed cutting edges have become dulled.

The invention consists of novel structural details and combinations of parts, which hereinafter will be more fully described, illustrated, and finally claimed.

In the drawings hereto attached and forming a part of the specification, Figure 1 is a side view of a reamer embodying the invention, the upper portion being broken away to show the solid formation of the head. Fig. 2 is a vertical central section of a modification showing the head provided with a longitudinal opening and downwardly-inclined lateral ducts. Fig. 3 is a perspective view showing the parts separated. Fig. 4 is a view similar to Fig. 2, showing the lateral ducts upwardly inclined. Fig. 5 is a detail perspective view showing a series of bits.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The body 1 of the reamer is preferably upwardly tapered and terminates in a shank 2 for coupling thereto of the drill-rod by means of which the reamer is operated. The stem 3 is pendent from the body portion 1 of the reamer and is in coaxial alinement therewith and is of a length depending upon the number of bits or cutters to be strung thereon. The lower end of the stem is threaded to re-

ceive the point 4, the latter serving to confine the bits or cutters 5 between itself and the shoulder 6, formed at the root of the stem 3. The point 4 is provided with an opening 7 to receive a rod or like instrument to admit of screwing the same either upon or off from the stem 3, as may be required. The point 4 may be of any length and is preferably tapered, so as to readily enter the bore or opening to be enlarged.

The bits or cutters 5 are of annular formation, approximating the form of washers, the opening being of a diameter corresponding to the diameter of the stem 3 to admit of the cutters snugly fitting the stem when strung thereon. The annular bits or cutters increase in diameter from the point 4 toward the body 1 and operate progressively in enlarging the bore or opening, thereby admitting of the work being rapidly performed. When the lowermost edge of the bits or cutters become dulled, the said cutters may be reversed, thereby bringing new cutting edges into working position, the change being effected by removal of the point 4 and slipping the cutters from the stem 3 and replacing said cutters upon the stem in reverse position.

In practice the reamer is designed to be coupled to the drill-rod in any substantial way and has a vertical reciprocating movement imparted thereto from the surface by any type of mechanism commonly employed in the operation of boring Artesian and oil wells. The progressive arrangement of the cutters enable each to perform a proportionate amount of work in the enlargement of the bore or opening. Hence the operation is rapid and the sides of the bore or opening smooth and clean, since the cutters operate in clay and like soft formation by pushing the same ahead and in stony and like hard formation by pounding and breaking same away, the resultant cut in either case being clean and well defined.

The body of the reamer may be solid, as indicated in Fig. 1, or provided with a longitudinal opening 8 and lateral ducts 9, as shown in Figs. 2 and 4, and said lateral ducts

may be either inclined downwardly, as shown in Fig. 2, or upwardly, as shown in Fig. 4. The latter form of reamer admits of the drillings or cuttings being carried off by water as the work progresses.

Having thus described the invention, what is claimed as new is—

1. A reamer of the character described comprising a series of annular cutting edges separable from one another and having a progressive arrangement from the point to the body, substantially as set forth.

2. A reamer of the character described comprising a series of annular bits or cutters separable from each other and having a progressive arrangement from the point toward the body, substantially as set forth.

3. A reamer of the character described comprising a series of bits of approximately annular formation and having a progressive arrangement and adapted to be reversed to admit of new cutting edges being brought

into working position, substantially as described.

4. A reamer for the purpose specified, comprising a body having a stem, a series of bits strung upon said stem and having a progressive arrangement, and a point fitted to the extremity of the stem and serving to confine said bits, substantially as specified.

5. A reamer comprising a body having a stem, said body having a longitudinal opening and lateral ducts, a series of annular bits strung upon said stem and having a progressive arrangement, and a point fitted to the extremity of the stem for confining the bits, substantially as set forth.

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

PATFILLO HIGGINS. [L. S.]

Witnesses:

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GEORGE G. WATT.