

No. 817,296.

PATENTED APR. 10, 1906.

W. BESSON.  
TUBULAR ROCK BORING DRILL.  
APPLICATION FILED MAR. 31, 1905.

Fig. 1.

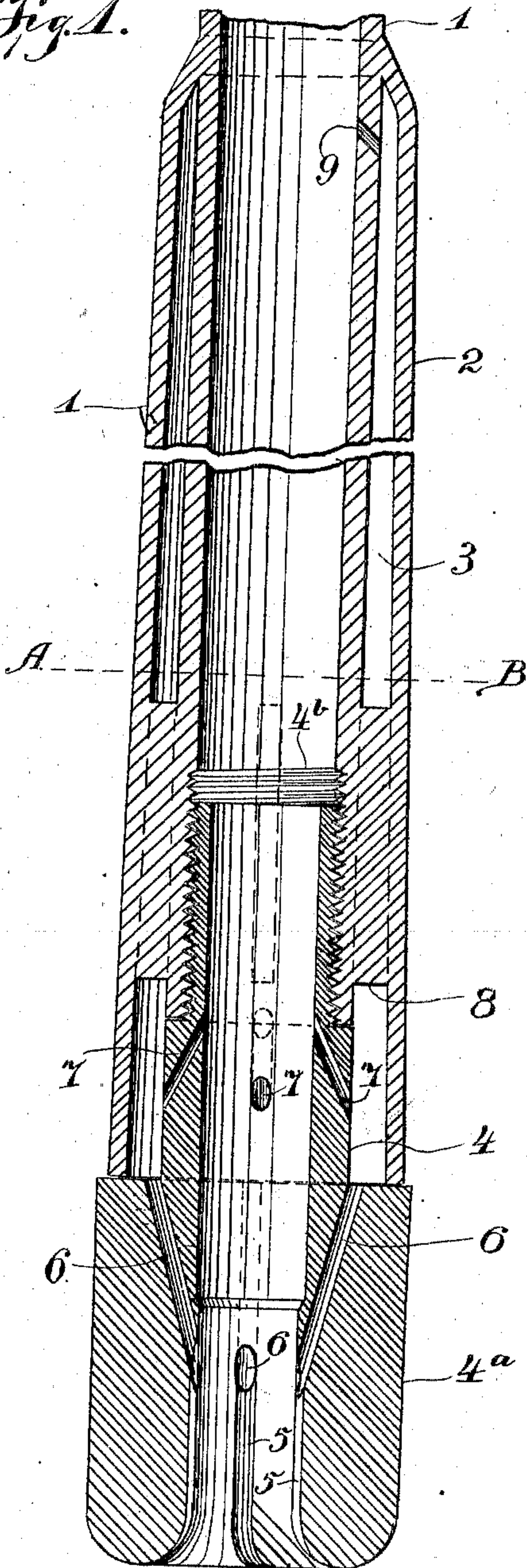


Fig. 3.

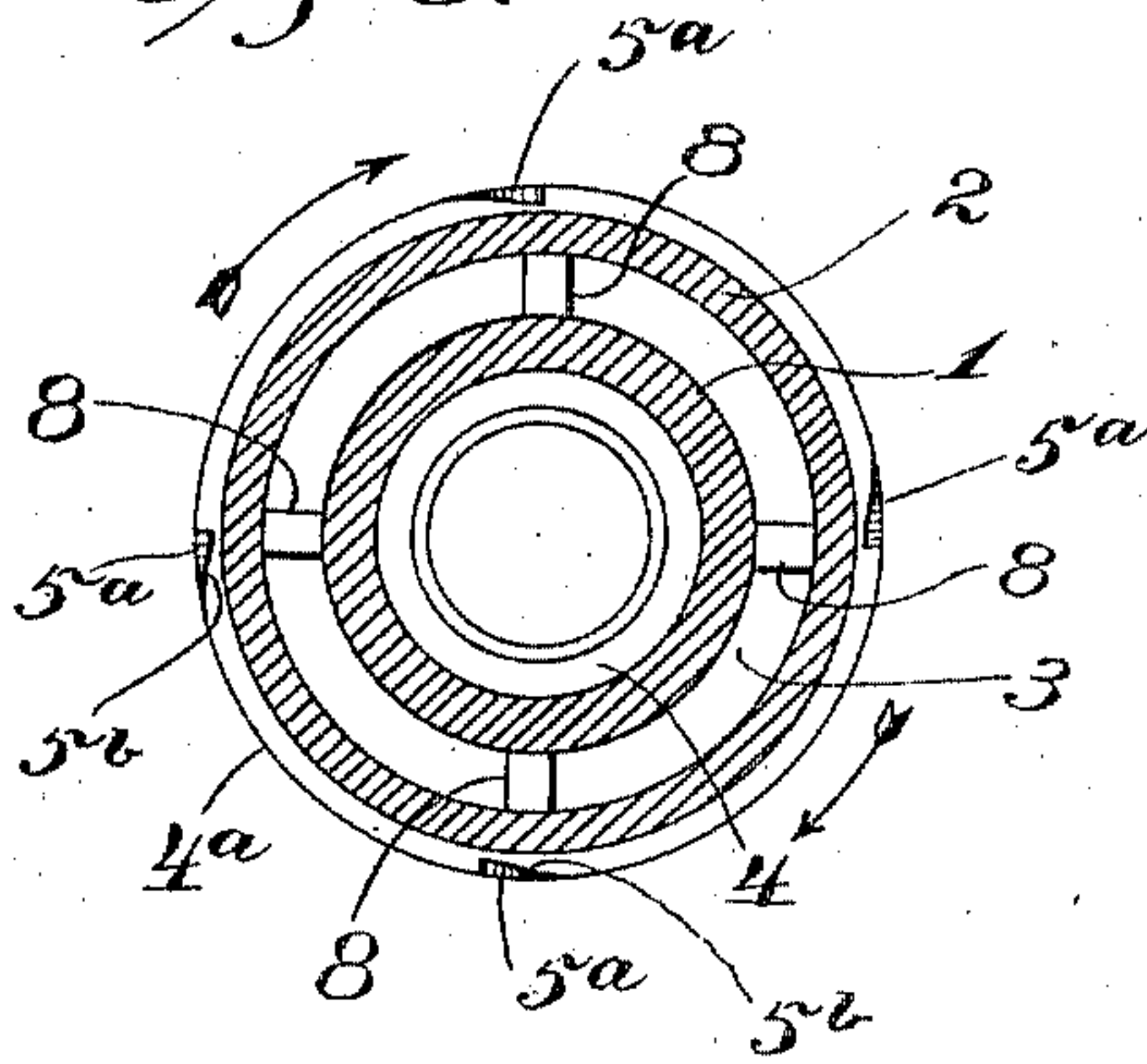
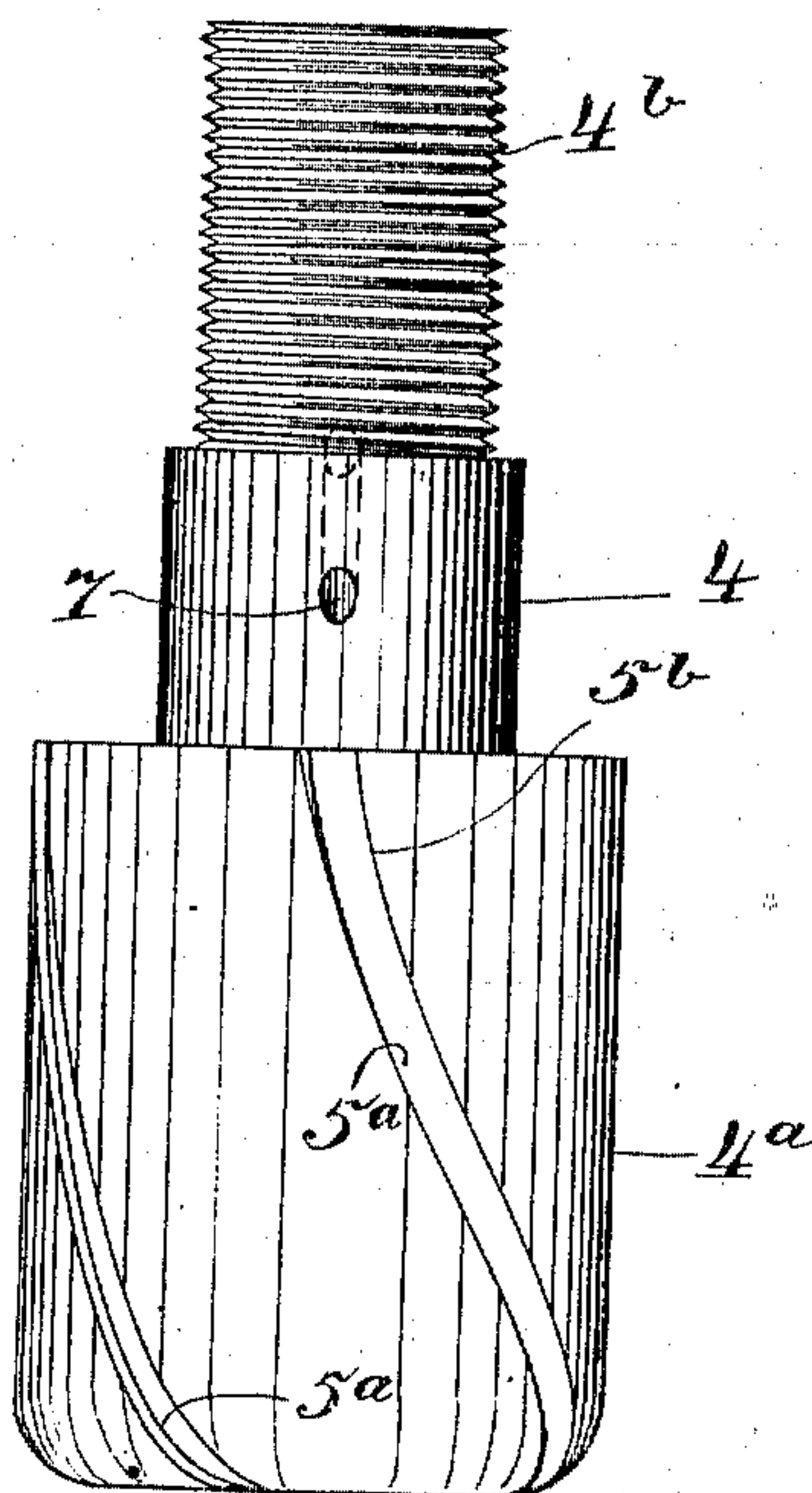


Fig. 2.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## TUBULAR ROCK-BORING DRILL.

No. 817,296.

Specification of Letters Patent

Patented April 10, 1906.

Application filed March 31, 1905. Serial No. 253,037.

*To all whom it may concern:*

Be it known that I, WILLIAM BESSON, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Tubular Rock-Boring Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to tubular rock-boring drills, and particularly to rotating drills adapted to cut a core from the rock.

It has for its object the provision of a bit adapted to communicate with a reservoir located near the bottom of said drill and adapted to contain loose or flowing abrasives.

With this and other herein-disclosed objects in view it consists of the constructions, combinations, and arrangements of parts hereinafter described and claimed.

In the herewith accompanying drawings, Figure 1 is a central vertical section of that portion of said drill which discloses my invention. Fig. 2 is a side elevation of the drill-point forming part of said invention, and Fig. 3 is a section through said drill and drill-point on the line A B of Fig. 1.

In the drawings, 1 is a tubular drill-rod of any desired length, upon the lower end of which is secured a sleeve or housing 2 of considerably greater diameter than said drill-rod, which thus leaves a reservoir-space 3 between said rod and said sleeve. The sleeve preferably depends below the plane of the lower end of said rod and may be secured at its upper end to the rod in any suitable manner; but I preferably secure it by contracting the upper end of the sleeve and shrinking it on. The lower end of the rod is threaded to engage the threaded reduced upper end of the drill-point 4, which point is tubular and is enlarged in diameter at its lower end, as at 4<sup>a</sup>, and is preferably reduced in diameter at its upper end, as at 4<sup>b</sup>. Said point has formed therein a series of interior grooves or channels 5, extending from its lower end a short distance upward. These grooves preferably connect at the lower end of the drill-point with exterior grooves or channels 5<sup>a</sup>, formed in said drill-point and extending upward, preferably in a course approximately like the grooves of a screw. Connecting with said interior grooves and extending upward through said enlarged portion of the drill-

point and connecting with said reservoir are passages 6, through which loose abrasives, as sand or emery or the like, stored in said reservoir may descend to the lower end of said drill-point and find their way to the face of the rock beneath the point of the drill. Passages 7 are also formed in said drill at any suitable place therein, but preferably in the central portion of the point, and are adapted to conduct water from the central passage of the drill rod or point to said reservoir for the purpose of washing said abrasives down into said passages 6. If desired, a suitable number of vertical spacing-webs 8 may be formed on said drill-rod to space the outer side walls of said reservoir apart therefrom, so that said wall will not be apt to collapse in the event that a pipe-wrench were applied to it when it is desired to disconnect said drill-point. If desired, small ports may be formed in the upper end of said reservoir, as at 9, to prevent the formation of a vacuum therein.

In operation said reservoir is first approximately filled with loose abrasives of any suitable nature—such as sand, emery, corundum, shot, carborundum, or otherwise—a section of the drill-rod being inverted for such purpose, and the drill-point is then secured in place and the implement is then lowered into the bore in the rock. Any suitable rotating means (not shown) is connected to said drill-rod, and said drill is rotated thereby. At the same time water is fed into said drill-rod at its upper end from any suitable source and in any suitable manner, (not shown,) preferably under pressure, and descends to and escapes from the bottom of the drill, passing on its way down through said passages 7 and 6 and said grooves 5 and washing down a supply of said abrasives from said reservoir. Said water then flows upward on the outside of the enlarged portion of the drill through said grooves 5<sup>a</sup>, carrying with it the millings or grindings from the rock and the spent and lighter particles of said abrasives. Out of the upper ends of said grooves 5<sup>a</sup> said water and millings flow upward between the outer wall of the reservoir or rod and the wall of the rock till they reach the surface and are conducted away from the hole by any suitable means or in any suitable manner. It will be observed that the central vertical passage of said drill is adapted to receive a core cut from the rock by the lower end and the inclosing wall of said passage in connection or cooperation with said abrasives and that said passage is



of greater diameter in its upper end than in its lower end. Thus the wall of said drill only contacts with said core for a short part of its length and excessive friction therewith is obviated. It will be observed, also, that the part 4<sup>a</sup> of said point is of slightly-greater diameter than said reservoir. Thus said reservoir and drill-rod are given clearance from the wall of rock, thereby avoiding friction and affording an outside passage for the upward flow of the water. The following edges or walls of the grooves 5<sup>a</sup> are beveled, as at 5<sup>b</sup>, Fig. 3, to permit abrasives to become wedged between the side of said point and the surrounding rock to smooth or abraid the wall of the rock and slightly enlarge the bore. The grooves 5 are formed in similar manner. It is obvious that my invention may, however, be modified in minor particulars within the spirit and scope of my said invention. I do not, therefore, desire to be limited to the exact arrangement of all parts as shown and described.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a drill, the combination of a tubular drill-rod, a reservoir formed on and around said rod at its lower end, a tubular drill-point secured to the lower end of said rod, and having passages formed therein connecting the central passage of said drill-point with said reservoir.

2. In a drill, the combination of a tubular drill-rod, a reservoir mounted on said rod at its lower end, a tubular drill-point secured to the lower end of said drill-rod and forming an approximate closure for said reservoir and having passages formed in its wall connecting

its central passage with said reservoir and having other passages formed in its wall connecting said reservoir with said central passage at a plane below the first said wall-passages, said drill-point being enlarged in external diameter and reduced in internal diameter at its lower end, said drill-point having a series of interior and exterior grooves formed in said lower end, substantially as described.

3. The combination of a tubular drill-rod, a bit carried thereby, a reservoir for loose abrasive carried by said rod and communicating with the central passage of said rod and bit, the construction being such that a supply of loose abrasives may flow from said reservoir to the central passage of said bit.

4. A drill-rod provided with an abrasive-storing reservoir, and a drill-point removably secured to said rod and forming part of the inclosing wall of said reservoir and provided with passages adapted to conduct water from said drill-rod to said reservoir and with other passages adapted to conduct water and loose abrasives from said reservoir to the lower end of said point.

5. A tubular drill-rod, a tubular drill point or bit engaging said drill-rod, a housing carried by said drill-rod and surrounding the lower end of said drill-rod and the upper end of said bit and in connection therewith forming a reservoir for the storage of loose abrasives.

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

WILLIAM BESSON

Witnesses:

JAMES T. WATSON,  
W. H. SMALLWOOD.