

No. 726,255.

PATENTED APR. 28, 1903.

W. H. CLARK & F. J. CURRIER.

DRILL BIT.

APPLICATION FILED AUG. 25, 1902.

NO MODEL.

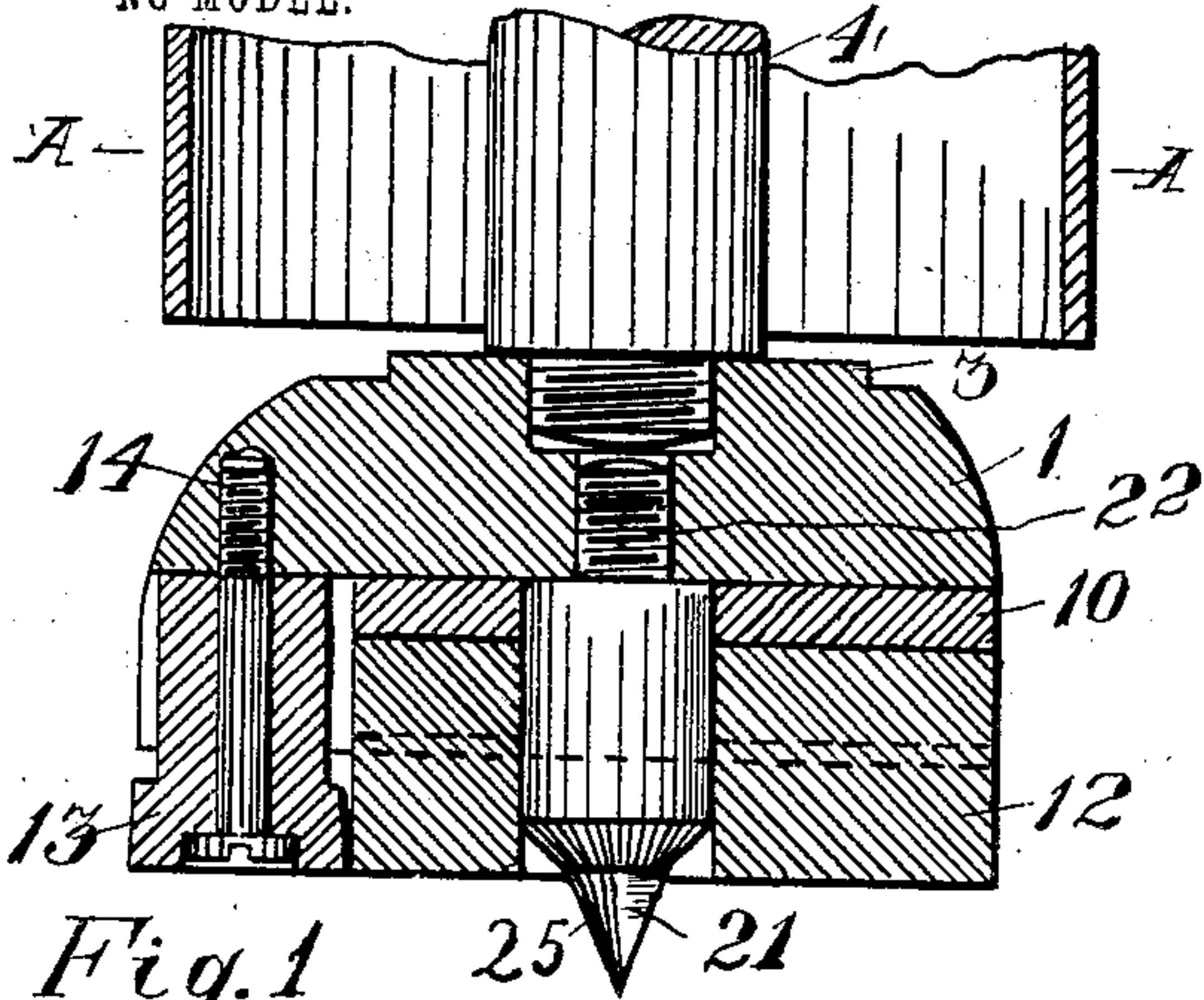


Fig. 1

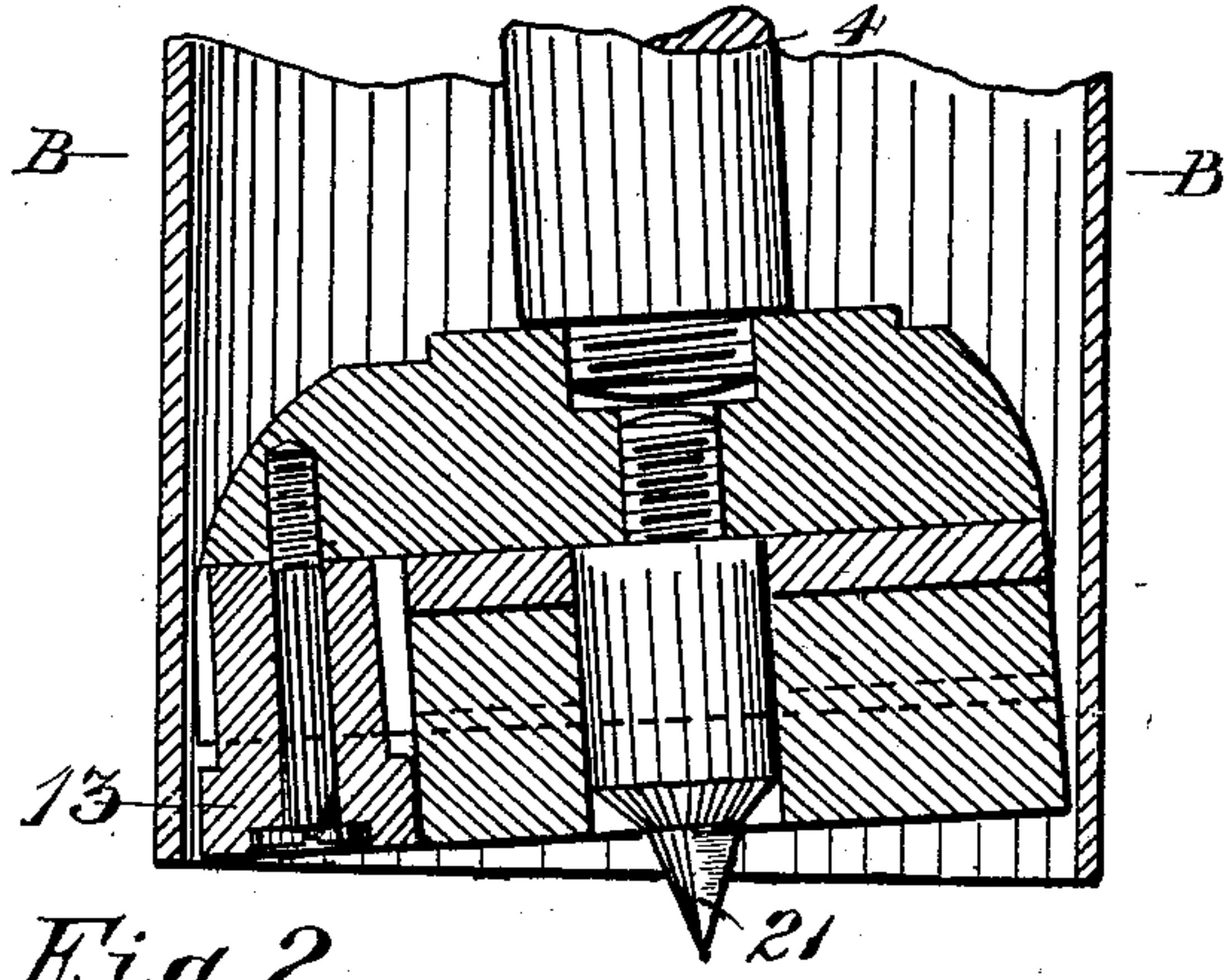


Fig. 2.

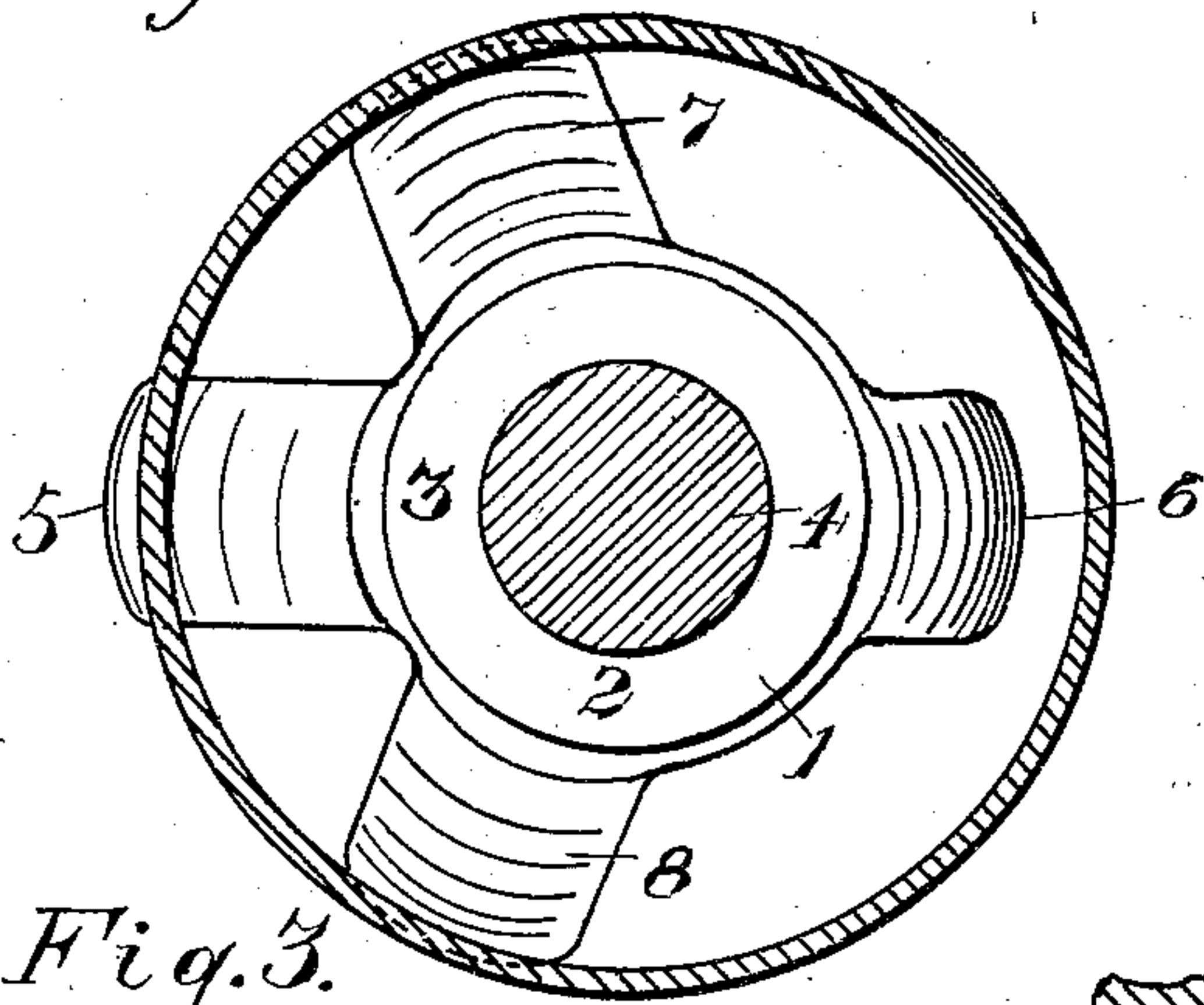


Fig. 3.

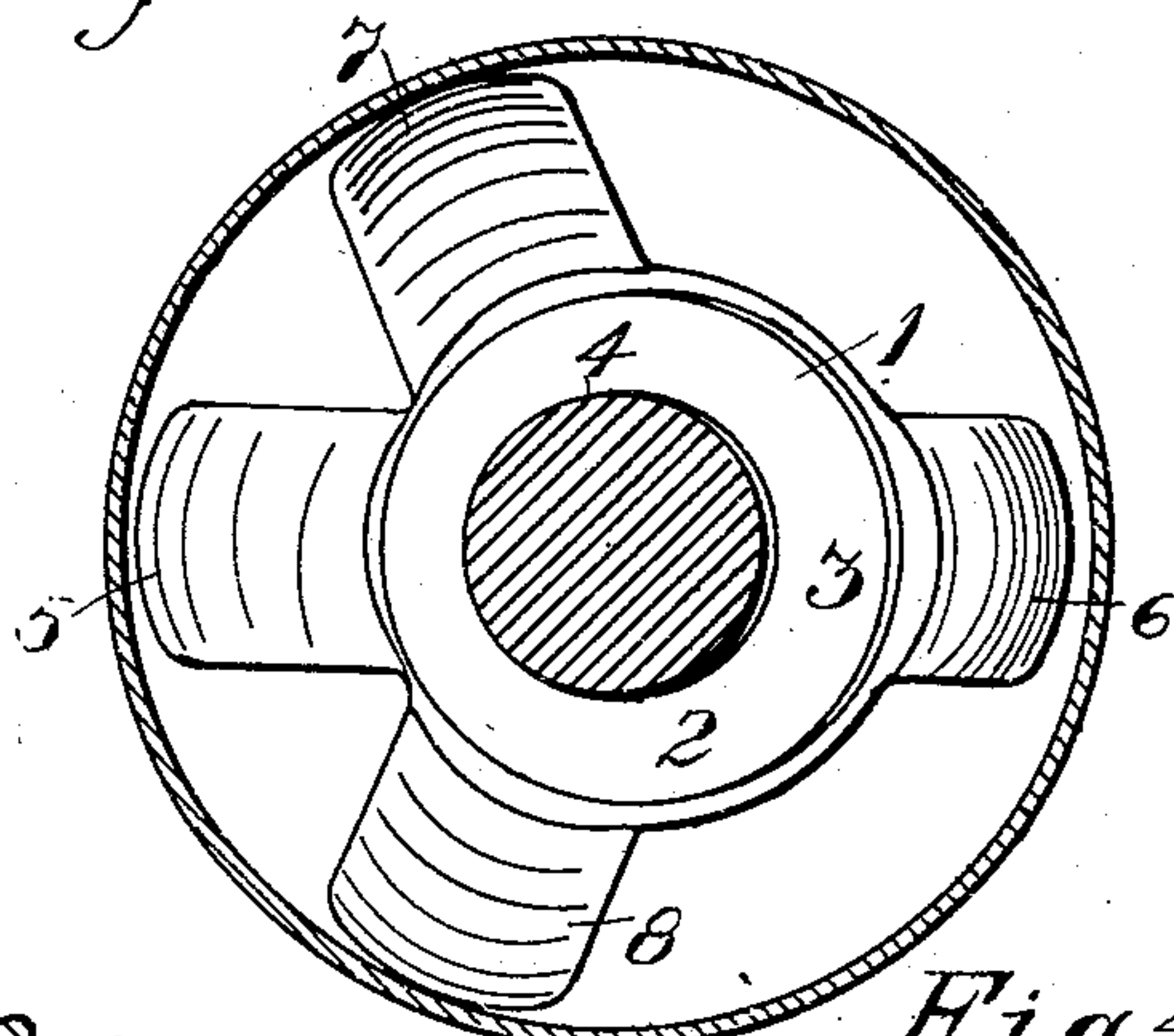


Fig. 4.

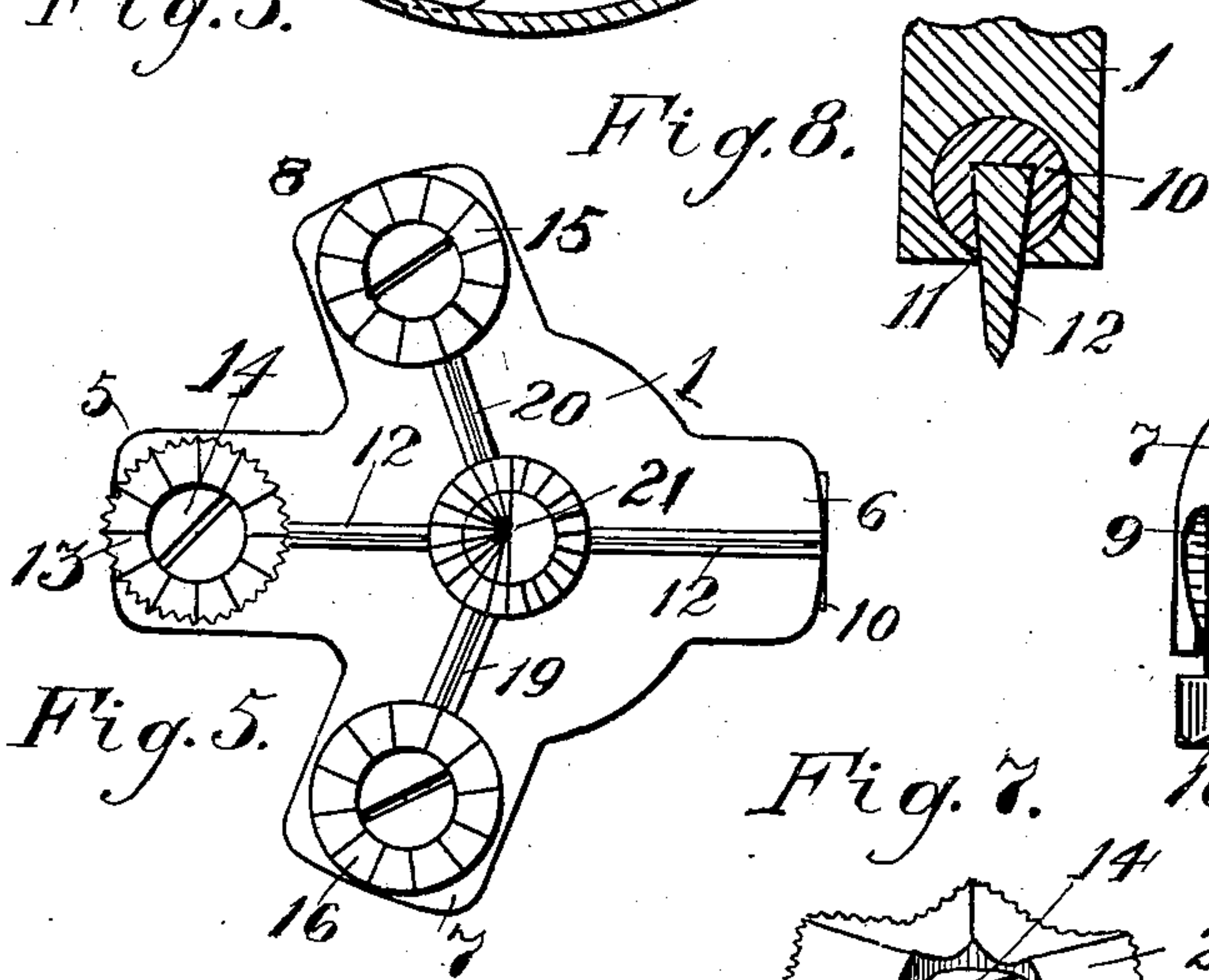


Fig. 5.

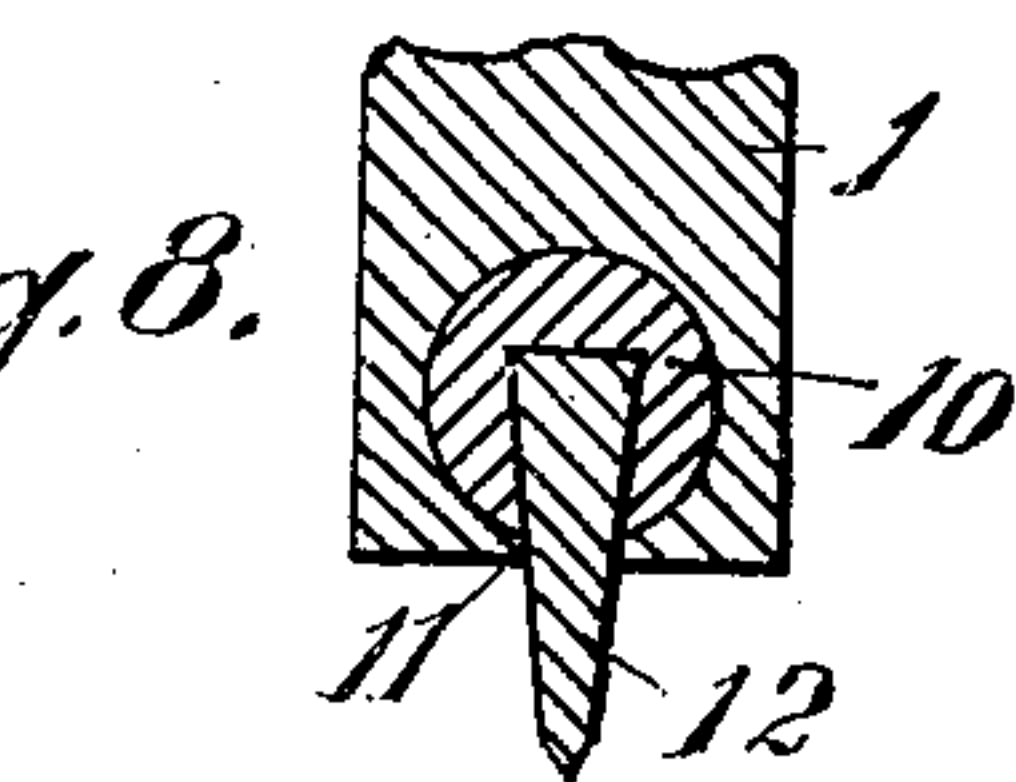


Fig. 6.

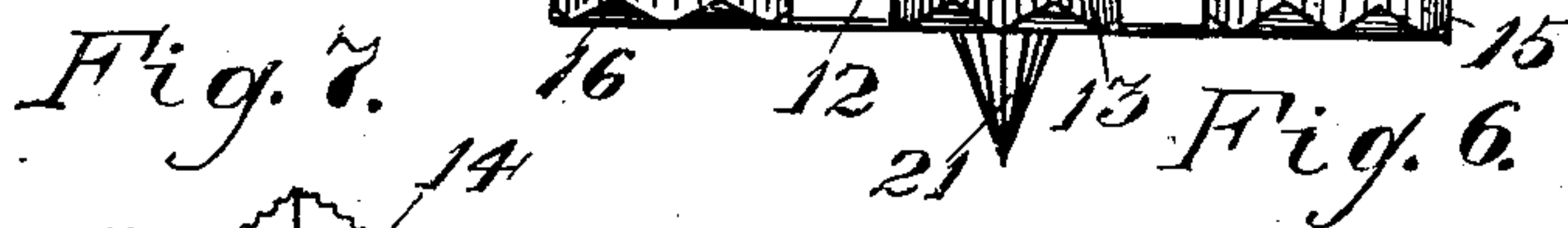
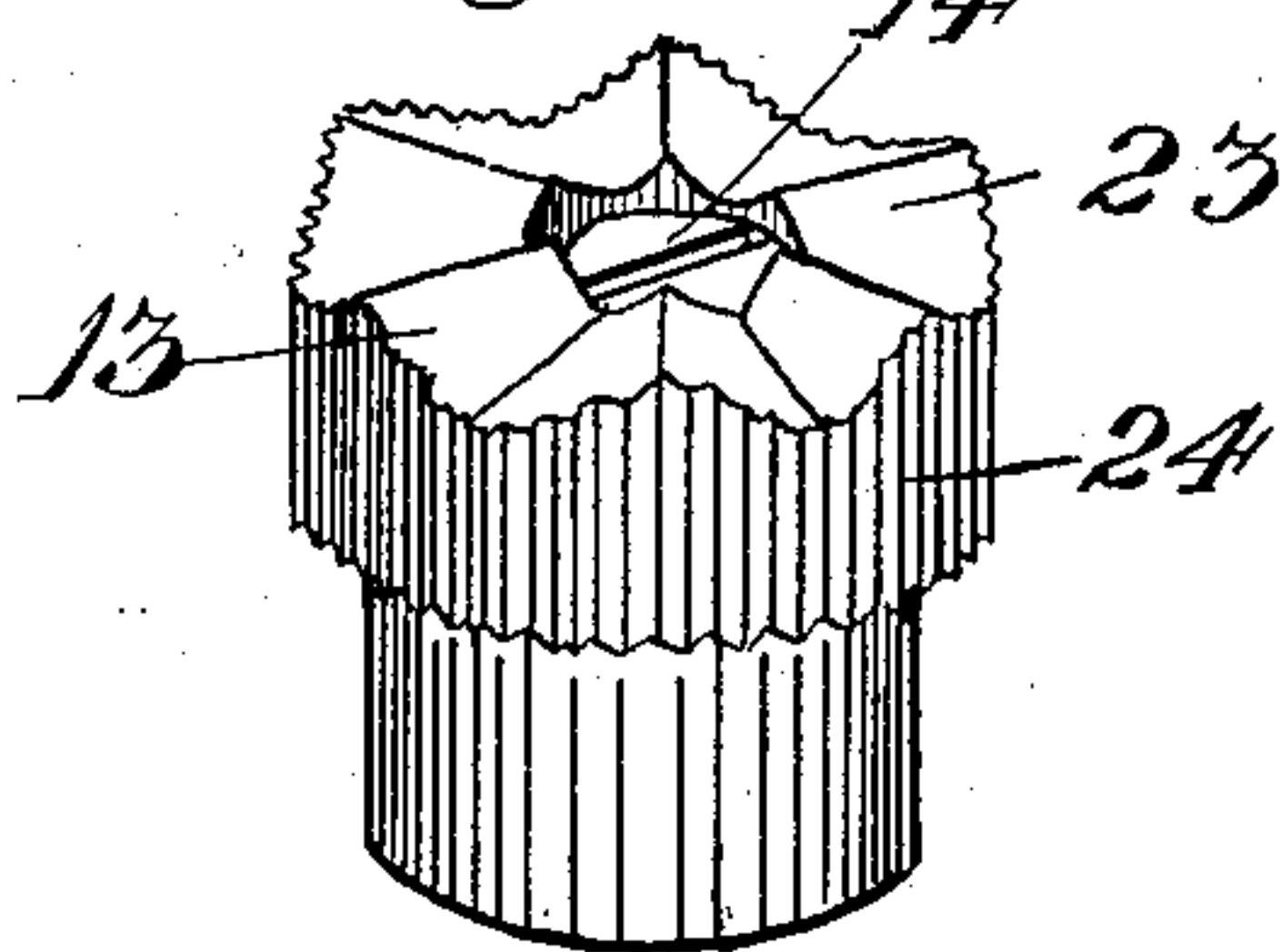


Fig. 7.



WITNESSES:
Robert Hunt-Lawson
Bessie Gorfinkel

INVENTORS
Wm. H. Clark
Frank J. Currier
 BY *Francis M. Wright*
 ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM H. CLARK AND FRANK J. CURRIER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNORS TO C. AND C. DRILL COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

DRILL-BIT.

SPECIFICATION forming part of Letters Patent No. 726,255, dated April 28, 1903.

Application filed August 25, 1902. Serial No. 120,911. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. CLARK and FRANK J. CURRIER, citizens of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Drill-Bits, of which the following is a specification.

This invention relates to improvements in drill-bits such as are used in connection with drilling-machines for boring wells for oil or water or other purposes, the object of our invention being to provide a bit which will permit of the cutting edge being removed and replaced by a sharp edge when worn blunt with use and which will advantageously permit of the bit cutting a hole sufficiently great in diameter to permit the casing of the well to drop readily thereinto, while at the same time permitting the bit to be drawn upward within the casing when not in use.

A further object of the invention is to provide a bit which shall be especially adapted for hard formations, but also very effective for all formations.

The invention therefore resides in the novel construction, combination, and arrangement of parts for the above ends hereinafter fully specified, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a vertical section showing the bit in the position of operation. Fig. 2 is a similar view showing the bit withdrawn within the casing. Fig. 3 is a horizontal section on the line A A of Fig. 1. Fig. 4 is a similar section on the line B B of Fig. 2. Fig. 5 is an enlarged bottom plan view of the bit. Fig. 6 is a front view of the bit. Fig. 7 is an enlarged perspective view of one of the cutters, and Fig. 8 is a broken cross-section through one of the knife-blocks and its bed.

Referring to the drawings, 1 represents the body of the bit, which is made, preferably, of cast-iron or of any suitable metal. Said bit is formed with a central portion 2, having a socket 3, into which the stem 4 of the bit is screwed, and is also formed with

extensions or wings 5 6 7 8. The extensions 5 and 6 are diametrically opposite to each other and form beds for rounded grooves 9 for the knife-blocks 10. Said knife-blocks have undercut seats 11 for the knives 12, in line with each other. Upon the end of the extension 5 is mounted a cutter 13, secured to said extension by means of a screw 14. At the ends of the extensions 7 and 8 are mounted similar cutters 15 and 16, similarly secured. In said extensions 7 and 8 are secured in like manner as in the extensions 5 and 6 knife-blocks having the knives 19 and 20. In the center of the bit between the four extensions is secured a spike 21. Said spike has a stem 22, screwed into the body 1 of the bit.

Each of the cutters 13 15 16 is formed on its under surface with a circular series of cutting edges 23, as shown, and the cylindrical surface of the cutter 13 is ribbed or corrugated lengthwise, as shown, forming vertical teeth or saw edges 24. These teeth 24, when the bit is revolved in the usual manner of drilling, assist in breaking down the wall of the hole.

The central spike 21 projects considerably below the knives and cutters and is of value in holding the cutter 13 in the extension 5 to its work. The special function of this cutter 13 in the central extension is to bore out a hole of a diameter not less than the external diameter of the casing, while the side cutters 15 16 perform the preliminary work of cutting a hole of smaller diameter. It is for this purpose also of holding the central cutter to its work that the lower portion of the spike is corrugated or ribbed, as shown at 25, on one side—namely, on the side next to or facing the central cutter—while the opposite or rear side is left smooth.

The central cutter 13 is located at a somewhat greater distance from the center of the bit than are the side cutters 15 16. The purpose of this is, as before stated, to enable the central cutter to cut out a hole of greater diameter than the side cutters; but when the bit is raised within the casing the upper curved faces 25 of the extensions 7 8 abut

against the edge of the casing and draw the extension 5 inward, also tilting the bit-stem and bit, as shown in Fig. 2.

The rounded or cylindrical form of the 5 grooves for the knife-blocks is of importance, since it enables the body of the bit to be made of cast-iron, there being now no corner which will start a crack in the bit-body due to the jar of the drilling.

10 The bit-body, being made of cast-iron, will not enlarge from the blows, as it would if made of steel or other metal.

We do not limit ourselves to circular cutters at the ends of the extensions, as the same 15 may be of any other desired form, nor do we limit ourselves to knives separable from the knife-blocks, nor to a single knife for each knife-block.

When withdrawing the drill through the 20 casing, if the friction on the lateral extensions is too great rollers can be inserted in the upper curved faces at the point of contact with the casing.

We claim—

25 1. A drill-bit having a drill-body, longitudinally-removable knives in said drill-body, and removable circular cutters at the outer ends of said knives, substantially as described.

2. A drill-bit having a drill-body, removable knives arranged at acute angles with 30 each other and removable cutters at the ends of said knives, having downwardly-directed circular cutting edges, substantially as described.

35 3. A drill-bit having a drill-body having rounded grooves, knife-blocks in said grooves, and knives in said knife-blocks, substantially as described.

4. A drill-bit having a drill-body having 40 rounded grooves, cylindrical knife-blocks in said grooves, said blocks having undercut seats, and knives in said seats, substantially as described.

5. A drill-bit having arms or wings, and at 45 the end of each wing, a cylindrical cutter, having a vertical axis, the lower edge of the cylinder having a circular cutting edge, substantially as described.

6. A drill-bit having a removable cutter 50 cylindrical in form having a circular series of radially-extending knives on its under surface, the cylindrical surface of the cutter having corrugations or ribs parallel with the axis of the cutter, substantially as described.

55 7. A drill-bit having a central extension and two lateral extensions at an acute angle therewith, and cutters removably mounted in the ends of the extensions, the cutter in

the central extension being farther from the center of the bit than those in the lateral ex- 60 tensions, substantially as described.

8. A cutter having a central extension or wing, and lateral extensions, the former being longer than the latter, and removable cutters carried by said extensions, substantially 65 as described.

9. A drill-bit having a central extension or wing and lateral extensions at an angle therewith, said extensions having rounded grooves, cylindrical knife-blocks in said grooves, and 70 knives in said knife-blocks, substantially as described.

10. A drill-bit having a central extension, lateral extensions at an acute angle thereto having upper curved faces, and knives re- 75 movably carried by said extensions, substantially as described.

11. A drill-bit having a central extension, a knife removably carried by said extension, and lateral extensions at an acute angle there- 80 to having upper curved faces, substantially as described.

12. A drill-bit having the body thereof made of cast-iron and having a rounded groove and a knife removably mounted in 85 said groove and having a cutting edge parallel with the axis or longitudinal direction of said groove, substantially as described.

13. A drill-bit having the body thereof made of cast-iron and having rounded grooves 90 and knives removably mounted in said grooves and having cutting edges parallel with the axes or longitudinal directions of said grooves, substantially as described.

14. A drill-bit having a drill-body with 95 rounded grooves and knives removably mounted in said grooves and having cutting edges parallel with the axes or longitudinal directions of said grooves, substantially as described. 100

15. A drill-bit having a drill-body with a rounded groove, a knife removably mounted in said groove, and having a cutting edge parallel with the axis or longitudinal direc- 105 tion of said groove and extensions or wings at an acute angle with said knife, substantially as described.

In witness whereof we have hereunto set our hands in the presence of two subscribing witnesses.

WM. H. CLARK.
F. J. CURRIER.

Witnesses:

FRANCIS M. WRIGHT,
BESSIE GORFINKEL.