

J. L. COOK.  
MINER'S DRILL.  
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945,446.

Patented Jan. 4, 1910.

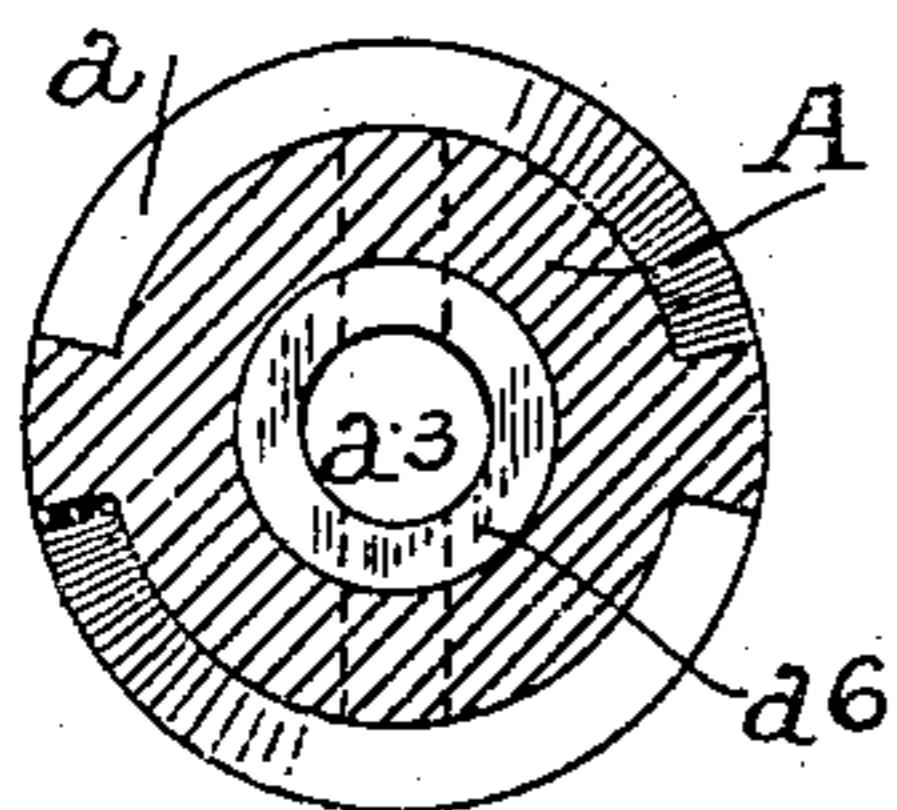


Fig. 7.

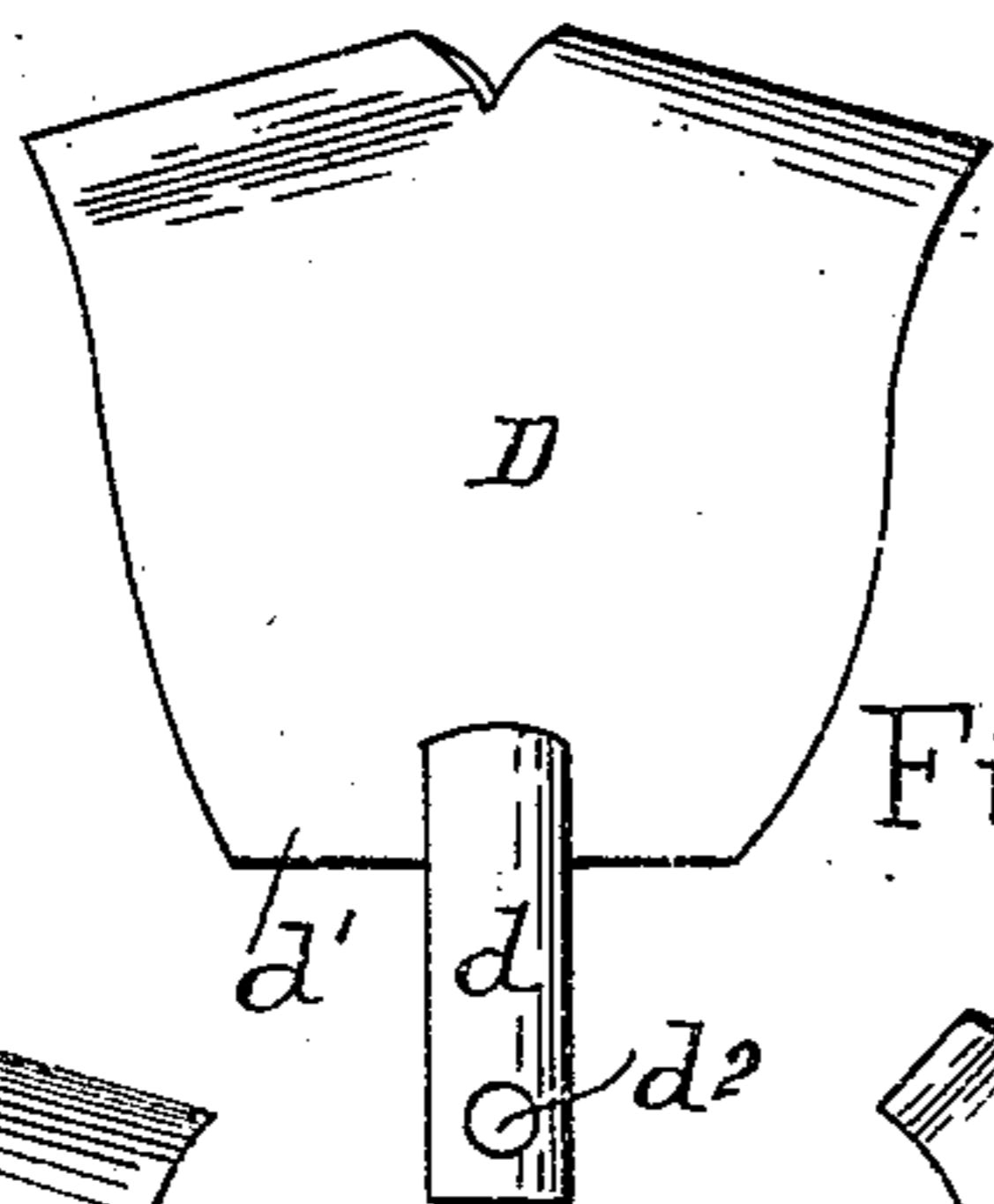


Fig. 9.

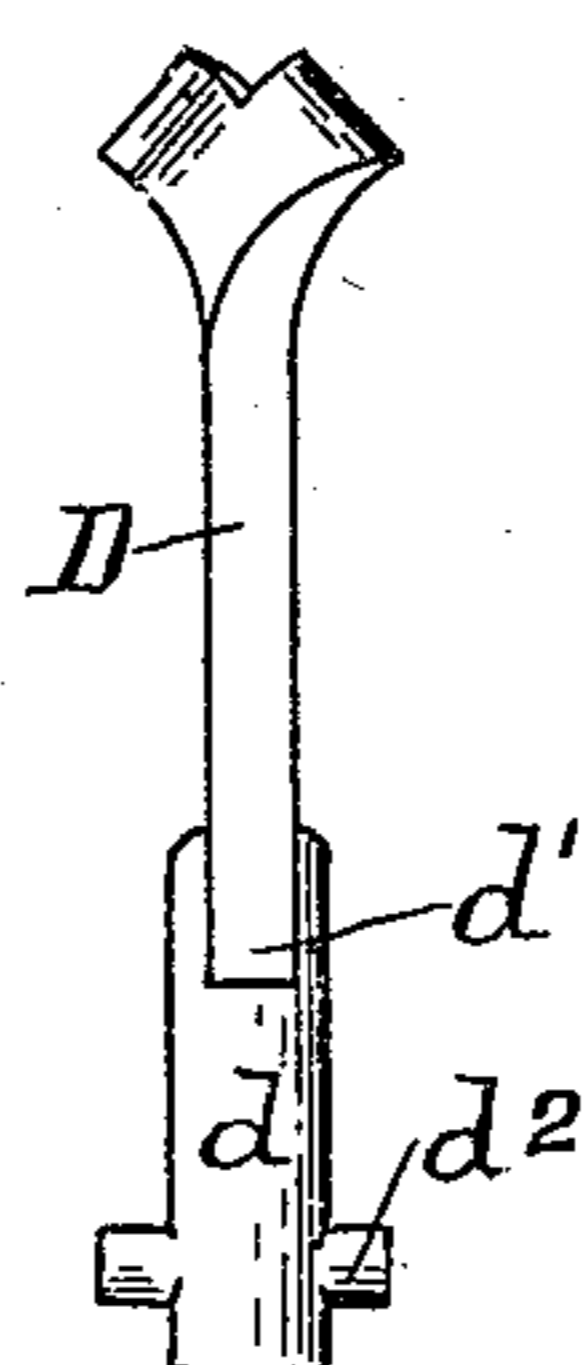


Fig. 10.

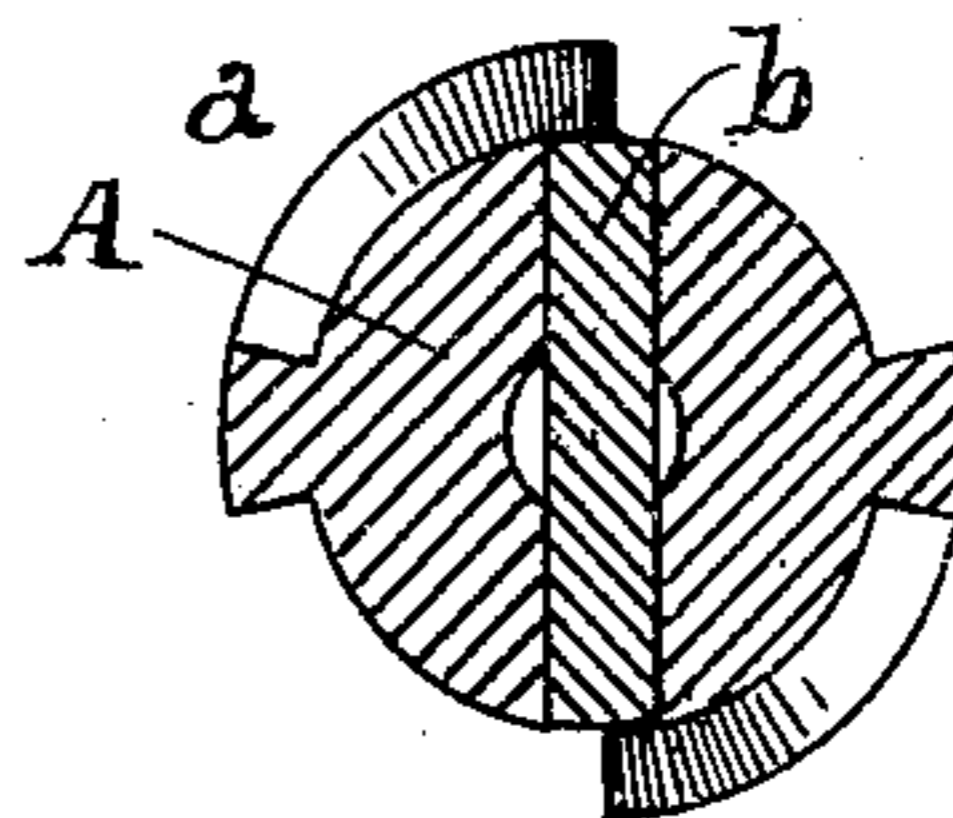


Fig. 8.

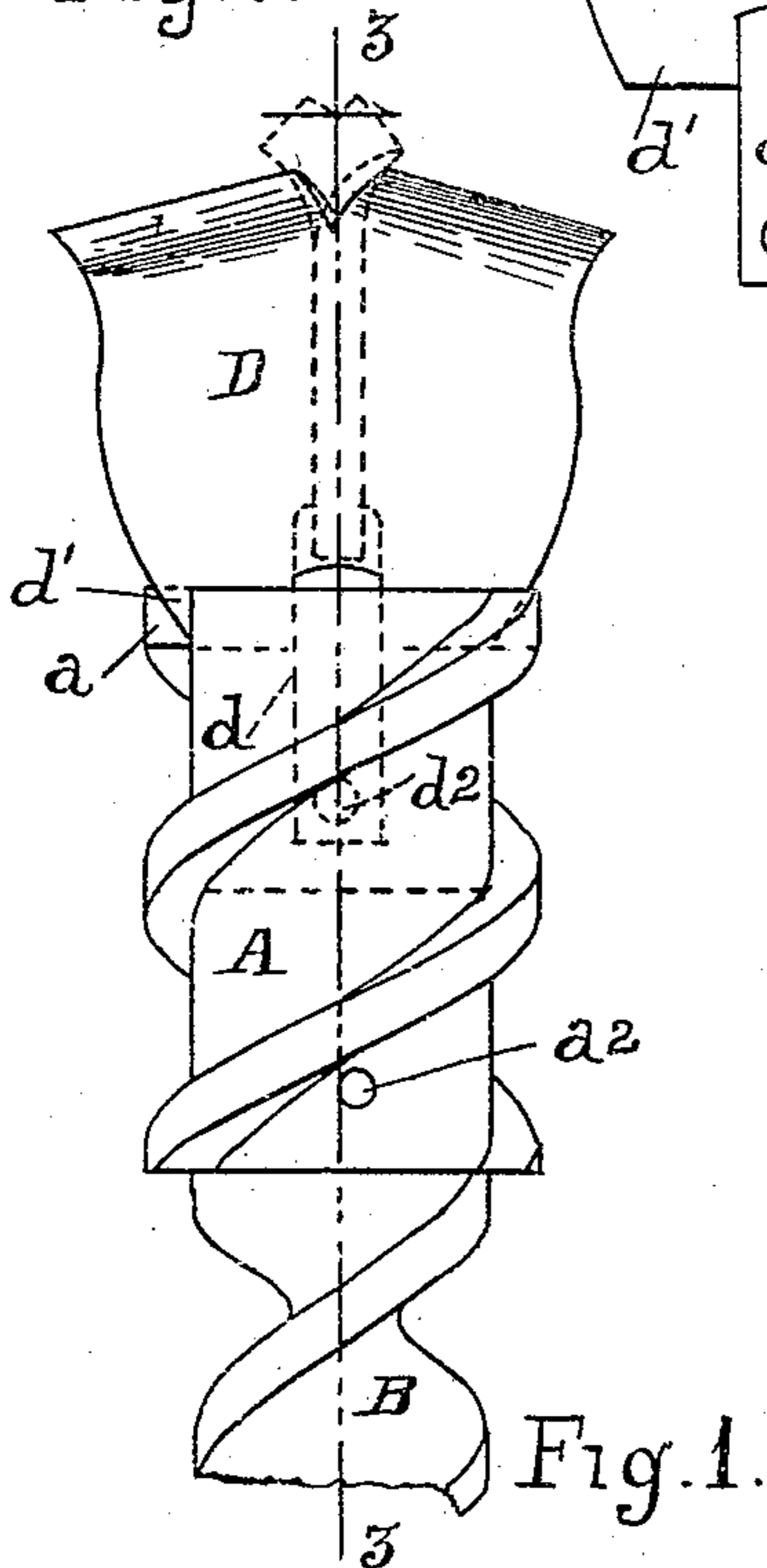


Fig. 1.

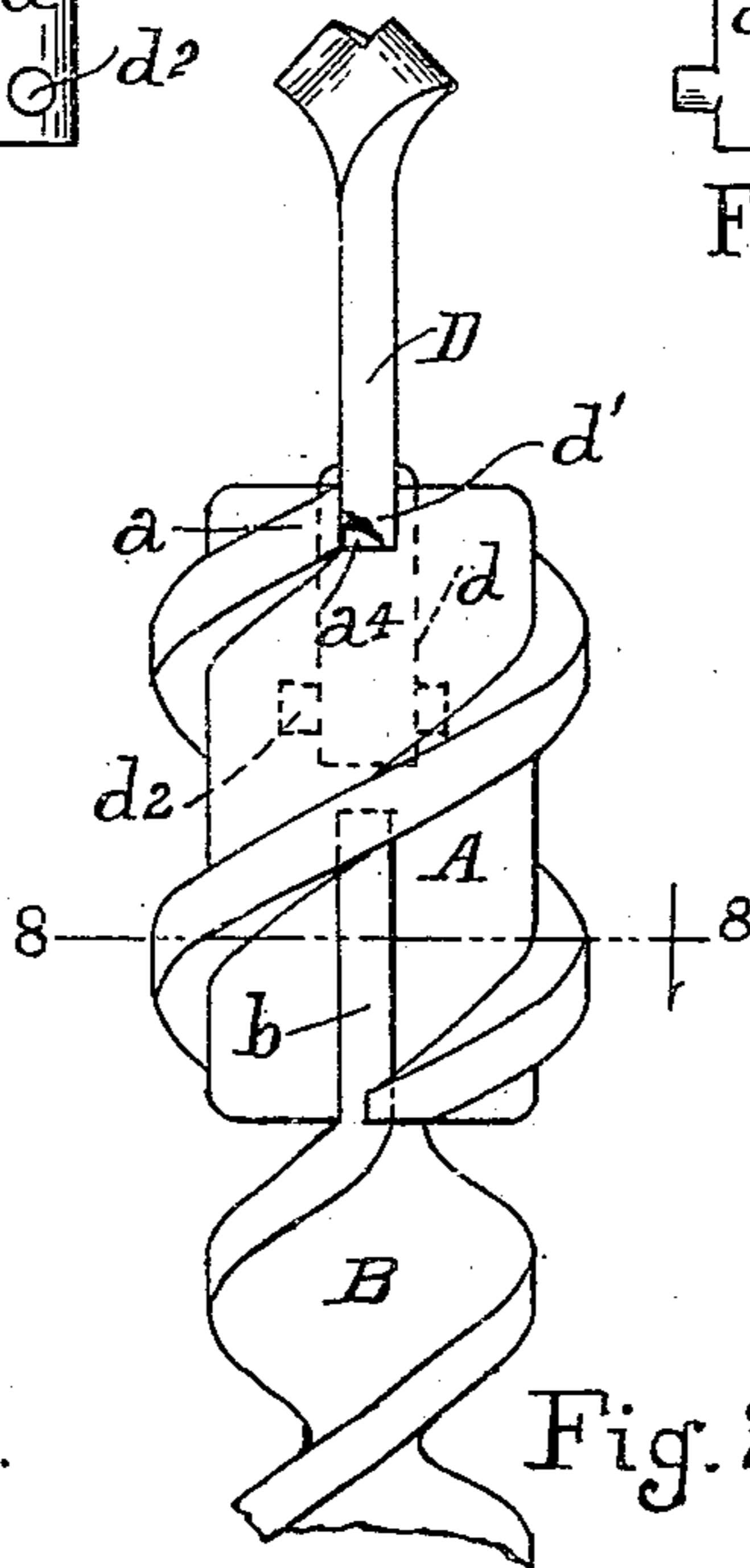


Fig. 2.

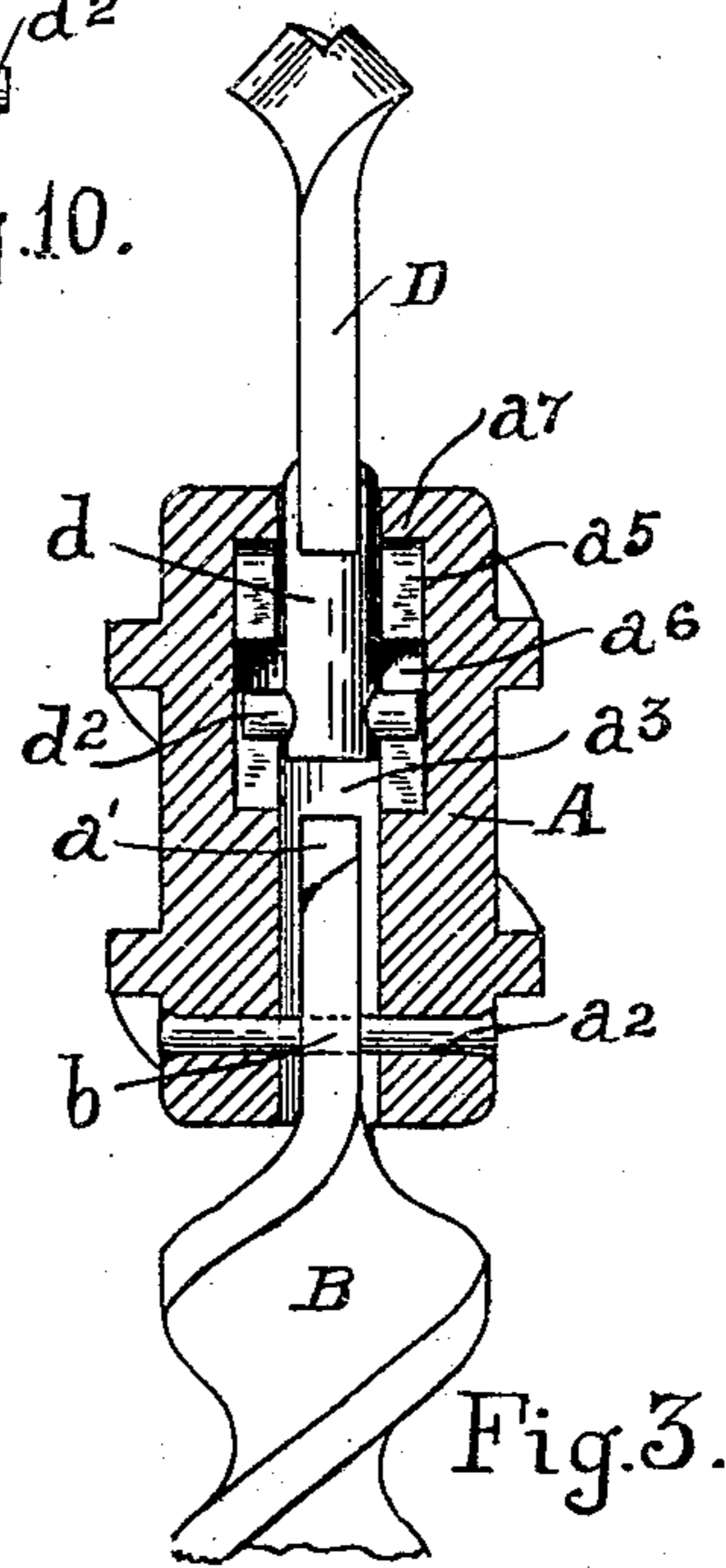


Fig. 3.

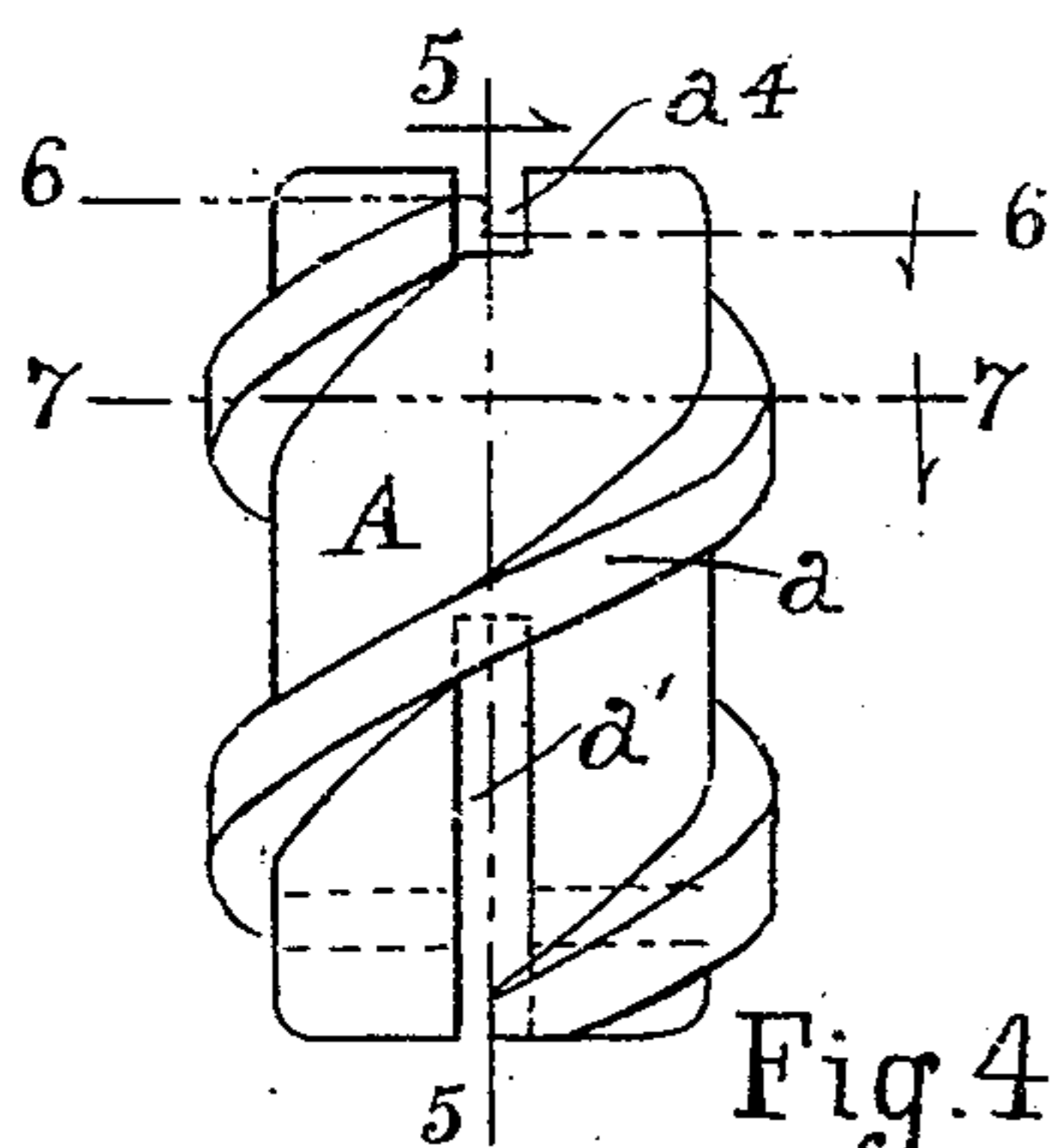


Fig. 4.

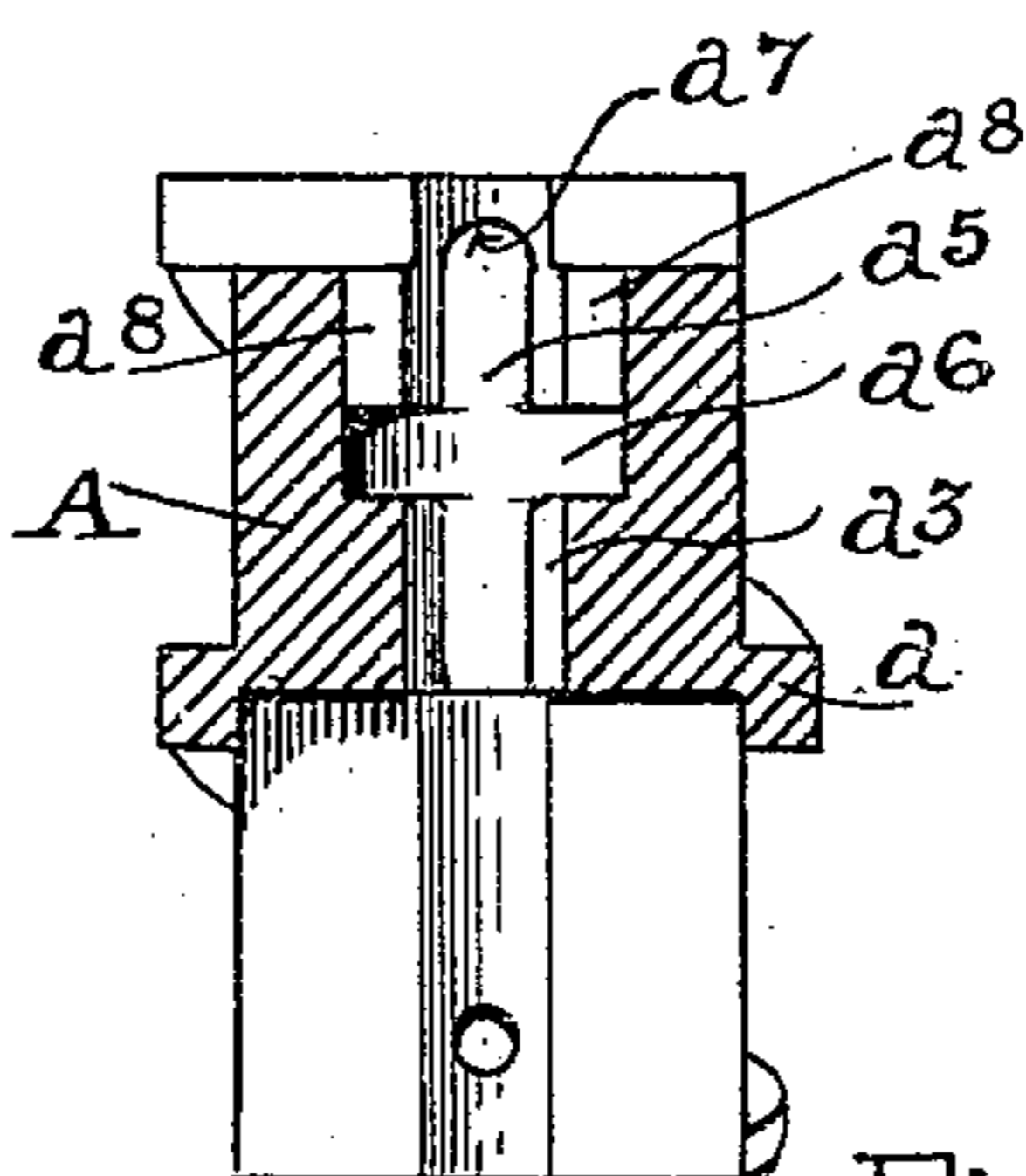


Fig. 5.

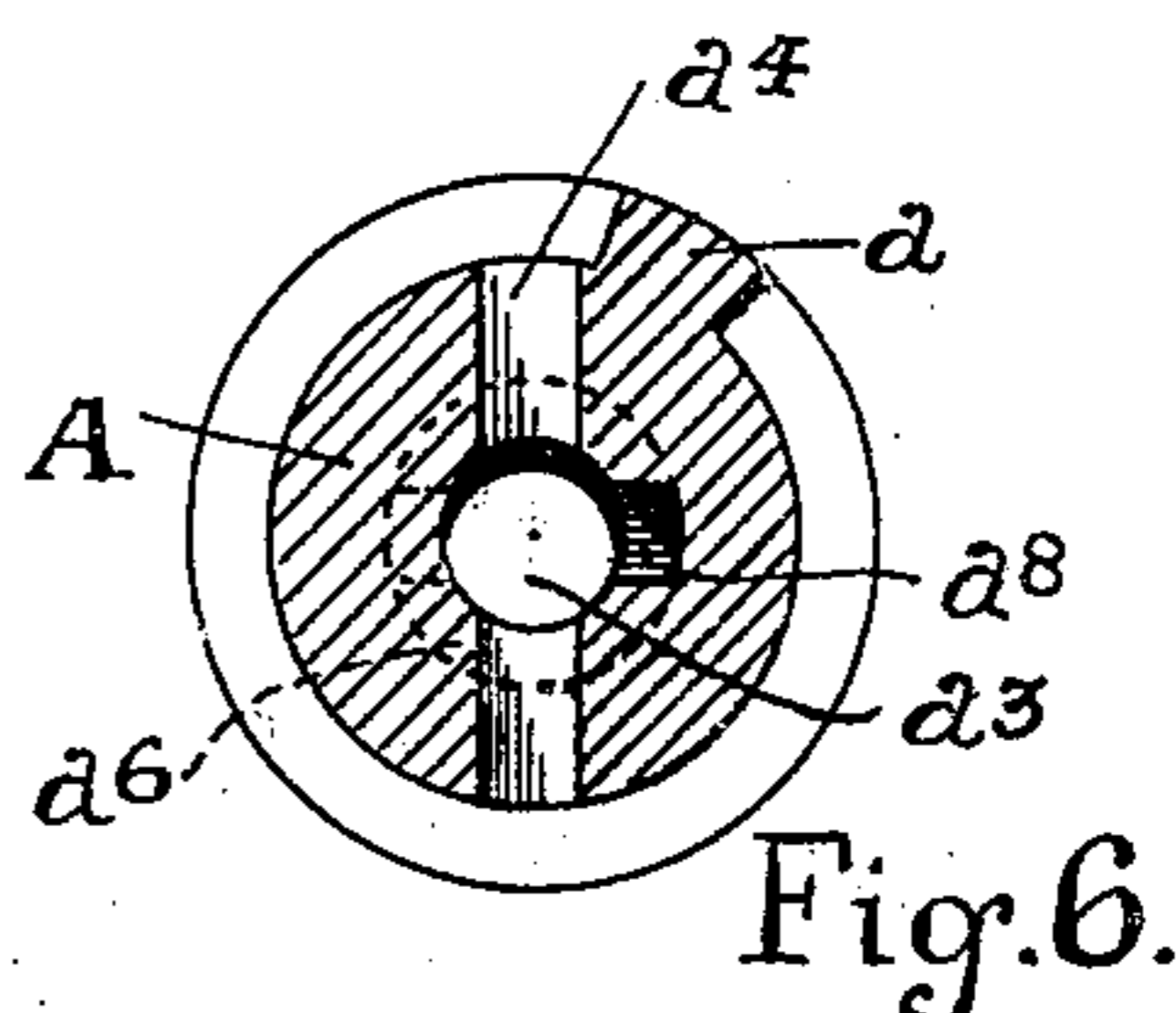


Fig. 6.

Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## MINER'S DRILL.

945,446.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed September 10, 1908. Serial No. 452,371.

*To all whom it may concern:*

Be it known that I, JAMES L. COOK, a citizen of the United States, residing at Springfield, in the county of Sangamon and State of Illinois, have invented a certain new and useful Miner's Drill, of which the following is such a full, clear, and exact description as will enable others skilled in the art to which it appertains to make and use my said invention.

This invention relates to drills such as are used in mining coal or other minerals.

The purposes of the invention are to provide in connection with the worm-bar or shaft of a drill, a head having a worm of the same pitch as the worm of the worm-bar, and forming a continuation thereof, so that the worm on the head and the worm-bar practically form a single worm for removing the cuttings made by the bit; to provide a bit of improved construction usable with the head, the head and the bit being so constructed and arranged as to necessitate making a quarter turn of the bit during the operation of connecting the bit with the head, and a reverse quarter turn of the bit during the operation of disconnecting the bit from the head; to provide a head having a central bore and a transverse way, and a bit usable with said head and having a shank fitting within the bore thereof to center the bit and a laterally broadened blade fitting in the transverse way of the head so that the walls of the transverse way of the head will act on the sides of the bit to turn the bit, thereby preventing strain on the shank of the bit and permitting the use of a short bit having a relatively light shank, and to provide other new and useful features of construction hereinafter set forth.

My invention is illustrated in the annexed drawings, to which reference is made, and is hereinafter particularly described and finally recited in the claims.

Figure 1 of the drawings is a front elevation of the complete drill and shows the head connected with the worm-bar of an ordinary miner's drill, and the bit in place on the head in readiness for use, and shows in dotted lines the position of the bit after it has been given a quarter turn preparatory to the longitudinal withdrawal of the bit from the head. Fig. 2 is a left-hand side elevation of the drill. Fig. 3 is a longitudinal axial section through the head on the line 3. 3. of Fig. 1. Fig. 4 is a left-hand

side elevation of the head, detached. Fig. 5 is a vertical longitudinal section on the line 5. 5. of Fig. 4. Fig. 6 is a horizontal transverse section on the zig-zag line 6. 6. of Fig. 4, looking downward. Fig. 7 is a horizontal transverse section on the line 7. 7. of Fig. 4, looking downward. Fig. 8 is a horizontal transverse section on the line 8. 8. of Fig. 2. Fig. 9 is a front elevation of the bit detached; and Fig. 10 is a left-hand side elevation of the bit.

Similar reference letters and characters designate like parts in the several views.

The head A is a cylindrical casting having an external worm  $a$ , and also having in its lower part a longitudinal slot  $a'$ . A worm-bar B of the usual construction has a shank-member  $b$  fitting in the slot  $a'$  of the head A, and the head is connected with the worm by a rivet  $a^2$  or equivalent connecting device. The width of the member  $b$  of the worm-bar B is equal to the diameter of the head A.

The worm  $a$  of the head A extends across the slot  $a'$  and when the member  $b$  of the worm-bar B is in place in the slot, the edges of the member  $b$  contact with the inner surface of the worm, and the worm serves to prevent lateral displacement of the upper end of the member  $b$ ; and when the parts are assembled a single rivet  $a^2$  serves to firmly connect the head A with the worm-bar B. The worm  $a$  has the same pitch and operates as a continuation of the worm of the worm-bar B and serves to remove from the drilled hole the cuttings made by the bit.

The head A has a longitudinal bore  $a^3$ , an upper transverse way  $a^4$ , two diametrically opposite vertical channels  $a^5$ , and an internal circular chamber  $a^6$  at right angles to the longitudinal channels  $a^5$ . At the upper ends of the channels  $a^5$  are ledges  $a^7$  forming the end walls of the channels. Diametrically opposite vertical ways  $a^8$  extend from the transverse ways  $a^4$  downward into the circular chamber  $a^6$ .

The bit D is a plate of steel of suitable quality and has a shank  $d$  fitting loosely in the central bore  $a^3$  in the head A. The blade of the bit is broadened as shown, in order that the bit may cut a hole of a diameter greater than the diameter of the worm  $a$  so as to leave clearance for the worm to draw the cuttings out of the hole. The bit has laterally extending members  $d'$  fitting in the transverse way  $a^4$  of the head A, so that when the bit is in place on the head the walls

of the way  $a^4$  will bear against the sides of the bit to turn the bit when the head is turned. The shank  $d$  is provided with pins  $d^2$  which fit loosely in the vertical channels  $a^5$  and the circular chamber  $a^6$ , so that when the bit is moved vertically the pins will travel in the channels  $a^5$  and when the bit is turned horizontally, while the head is at rest, the pins will travel in the circular chamber  $a^6$ .

The shank  $d$  may be of any suitable form and is preferably integral with the blade of the bit, but the shank and blade of the bit may be separate pieces secured together in any suitable manner. I prefer to equip the shank  $d$  with two radially projecting pins  $d^2$ , but a single pin obviously may be used without departure from my invention.

The shank  $d$  fitting in the bore  $a^3$  centers the bit and the broadened parts  $d'$  of the bit fitting in the transverse channel  $a^4$  hold the bit so that when the head is turned the strain will be on the blade of the bit instead of on the shank.

The bit herein shown and described is adapted for use with any other heads so formed that the shank of the bit fitting in a suitable socket will determine the centering of the bit, and the broadened part of the bit contacting with any suitable fixed part of the head will take the strain off of the shank, and the strain in operating will be applied on the sides of the bit.

A great practical advantage of the construction disclosed is that relatively short bits may be used with the head and when a bit is worn out it may be replaced by another at small cost.

In order to place the bit in position on the head, the bit will be turned as shown in Fig. 1, so that the blade will be at right angles to the transverse channel  $a^4$ , and the pins  $d^2$  will be in line with the vertical ways  $a^8$ , and if the bit be then pushed downward, the pins will travel downward through the ways  $a^8$  into the circular chamber  $a^6$ , and if the bit be then given a quarter turn the parts  $d'$  of the bit will come into position to enter the transverse way  $a^4$ , and if the bit be then pushed farther downward the parts  $d'$  of the bit will enter the transverse way  $a^4$ , and the sides of the bit bearing against the walls

of the way will prevent the bit from turning independently of the head. In detaching the bit from the head this procedure will be reversed. If the bit be slid longitudinally outward, without turning the bit, the pins  $d^2$ , (which are in line with the channels  $a^5$ , when the parts  $d'$  of the bit occupy the transverse way  $a^4$ ), will enter the vertical channels  $a^5$  and will strike against the end walls  $a^7$  to prevent complete withdrawal of the bit.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent is:

1. A head having a central bore adapted to accommodate the shank of a bit, a transverse way adapted to seat the blade of a bit, a circular chamber of greater diameter than the bore of said head, ways leading from said transverse way to said circular chamber, and longitudinal channels having end walls adapted to serve as stops.

2. A head having a circular bore adapted to accommodate the shank of a bit, a transverse way adapted to seat the broadened blade of a bit, a circular chamber of greater diameter than the bore of said head, and longitudinal ways communicating with said transverse way and said circular chamber; in combination with a bit having a broadened part adapted to fit in the transverse way of said head, a shank adapted to extend into the bore of said head and provided with a lateral pin adapted to travel in the circular chamber of said head; to permit rotation of the shank of the bit in the bore of the head and adapted to engage with a wall of said chamber to prevent longitudinal withdrawal of the shank of the bit and also adapted to travel in the longitudinal ways between the transverse way of the head and the circular chamber of the head, to permit the insertion and withdrawal of the shank of the bit.

In witness whereof I have hereunto signed my name at Springfield, Illinois, this 10th day of August, 1908.

JAMES L. COOK.

Witnesses:

A. R. LIVINGSTON,  
W. J. AURELIUS.