

No. 646,489.

Patented Apr. 3, 1900.

J. L. COOK.
TOOL CHUCK.

(Application filed June 28, 1899.)

(No Model.)

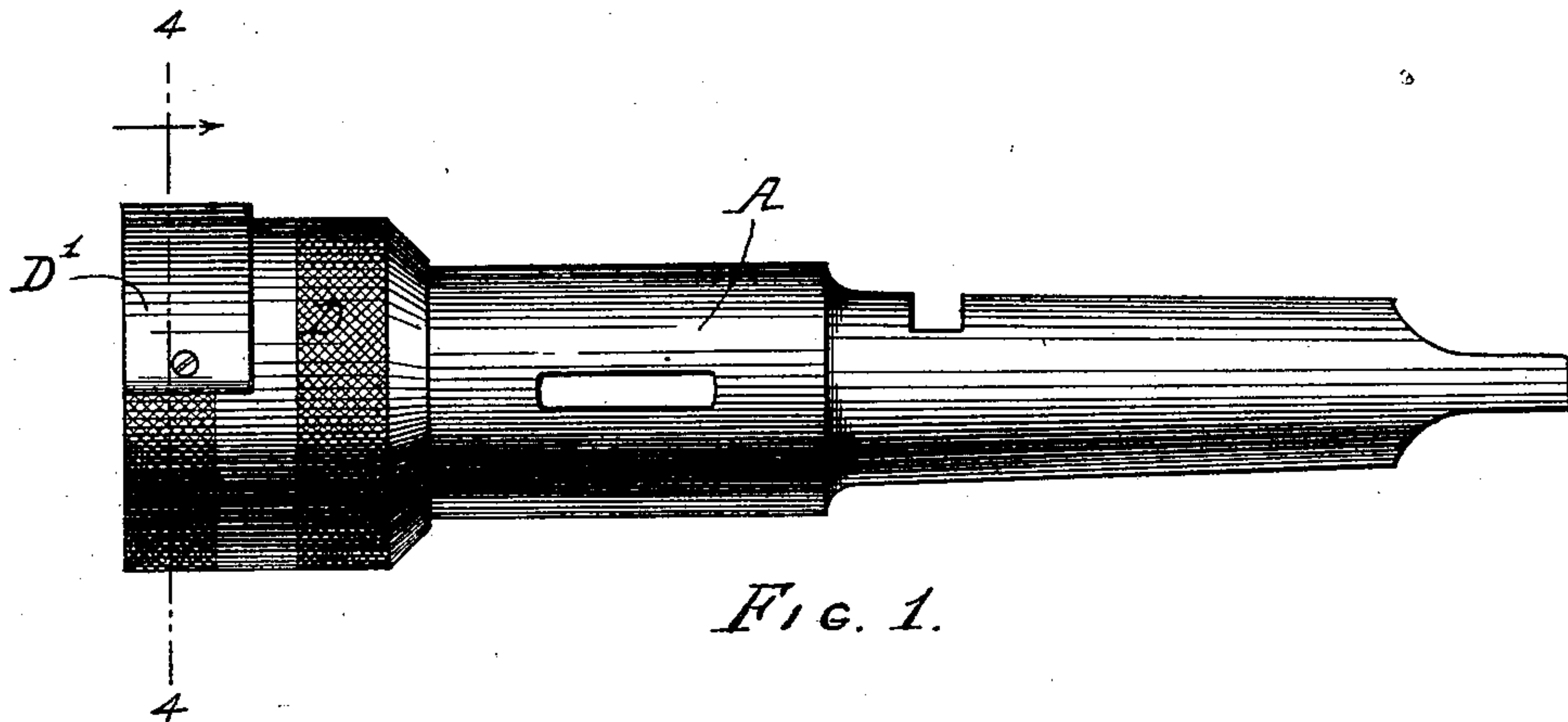


FIG. 1.

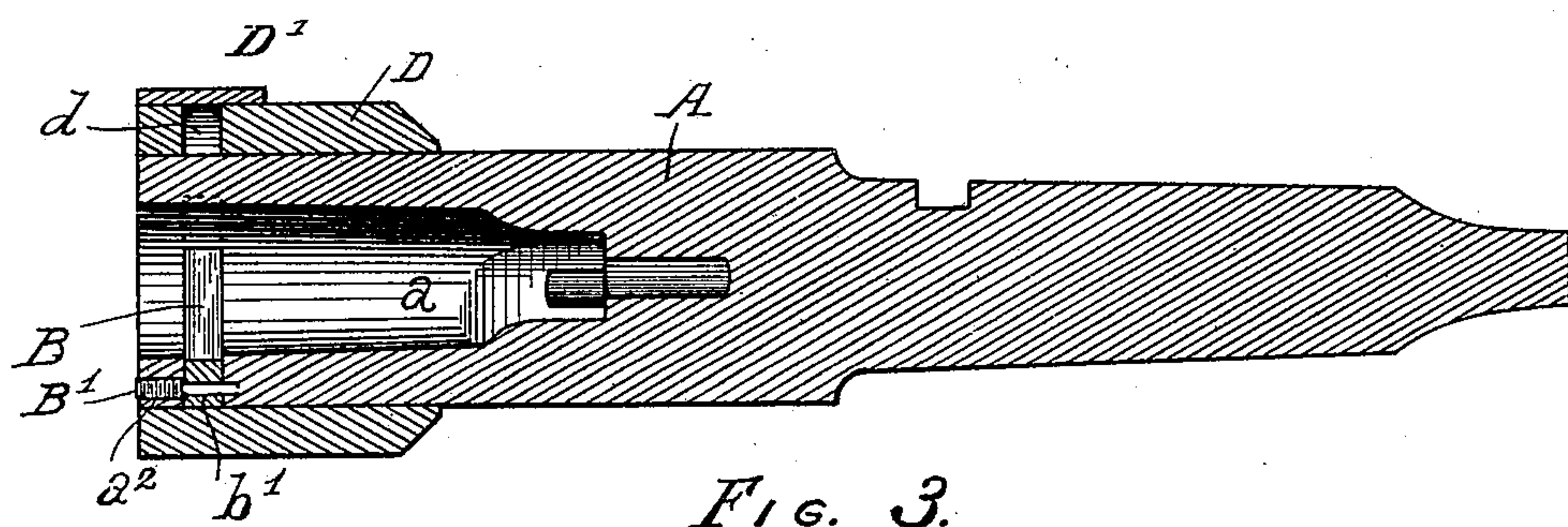


FIG. 3.

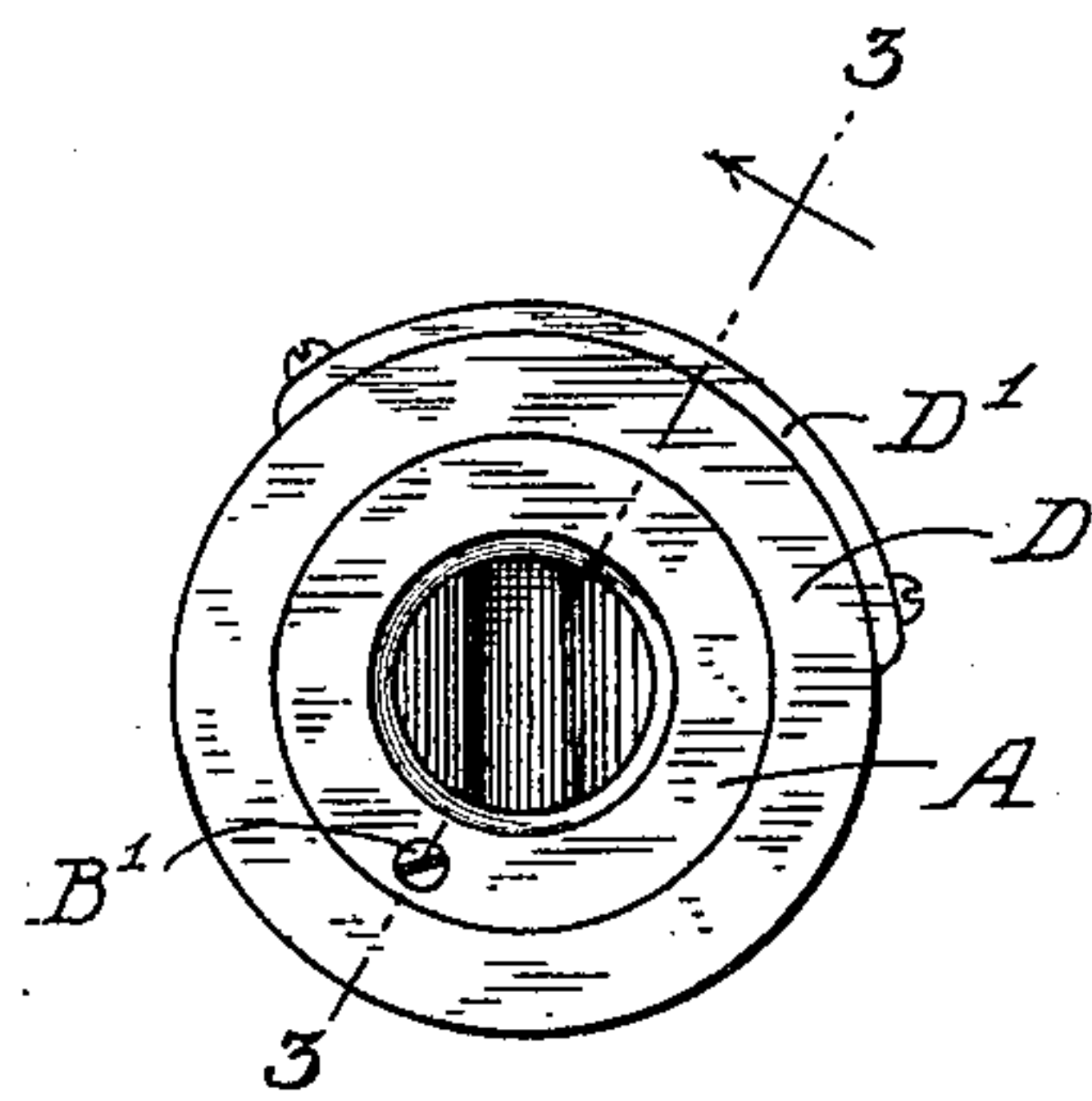


FIG. 2.

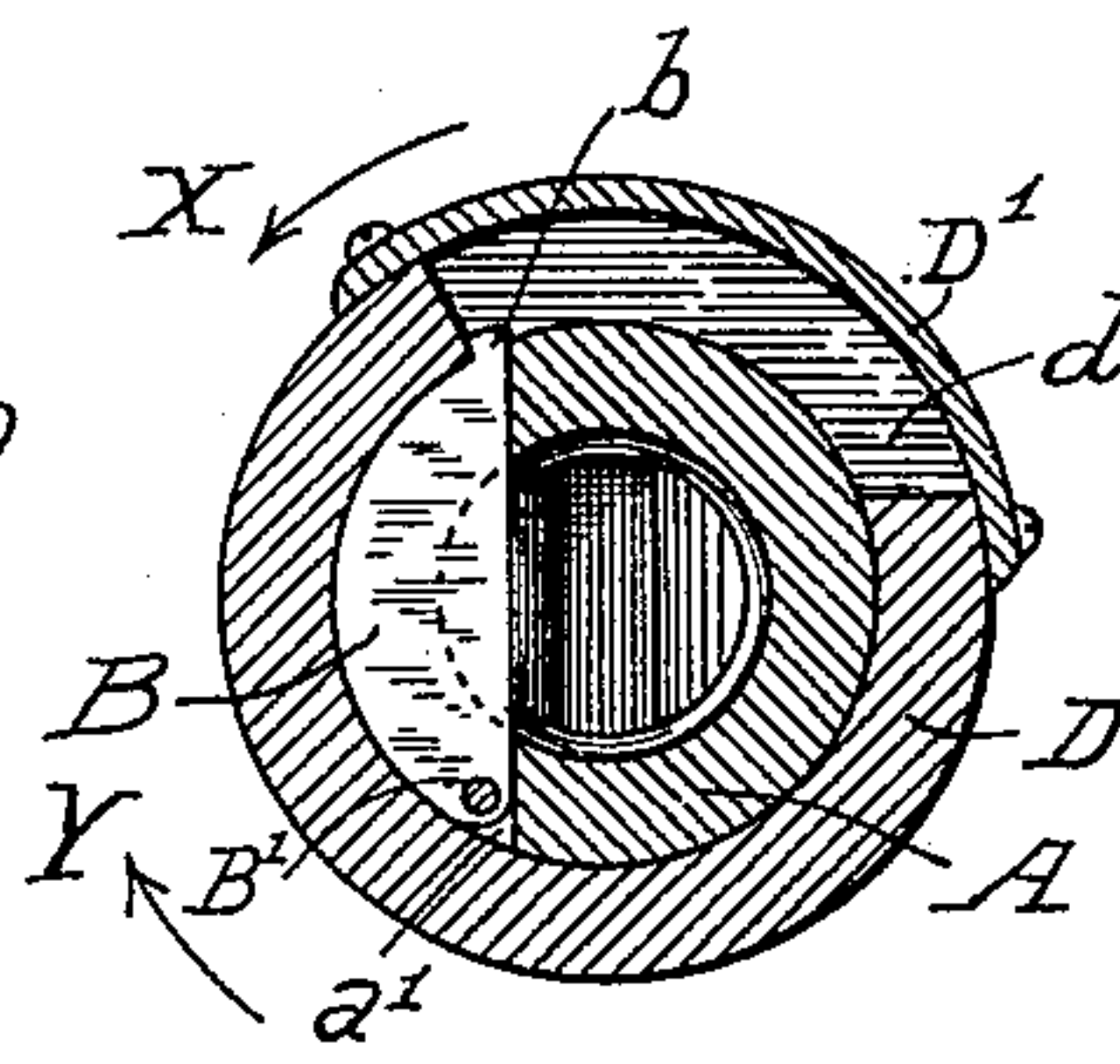


FIG. 4.

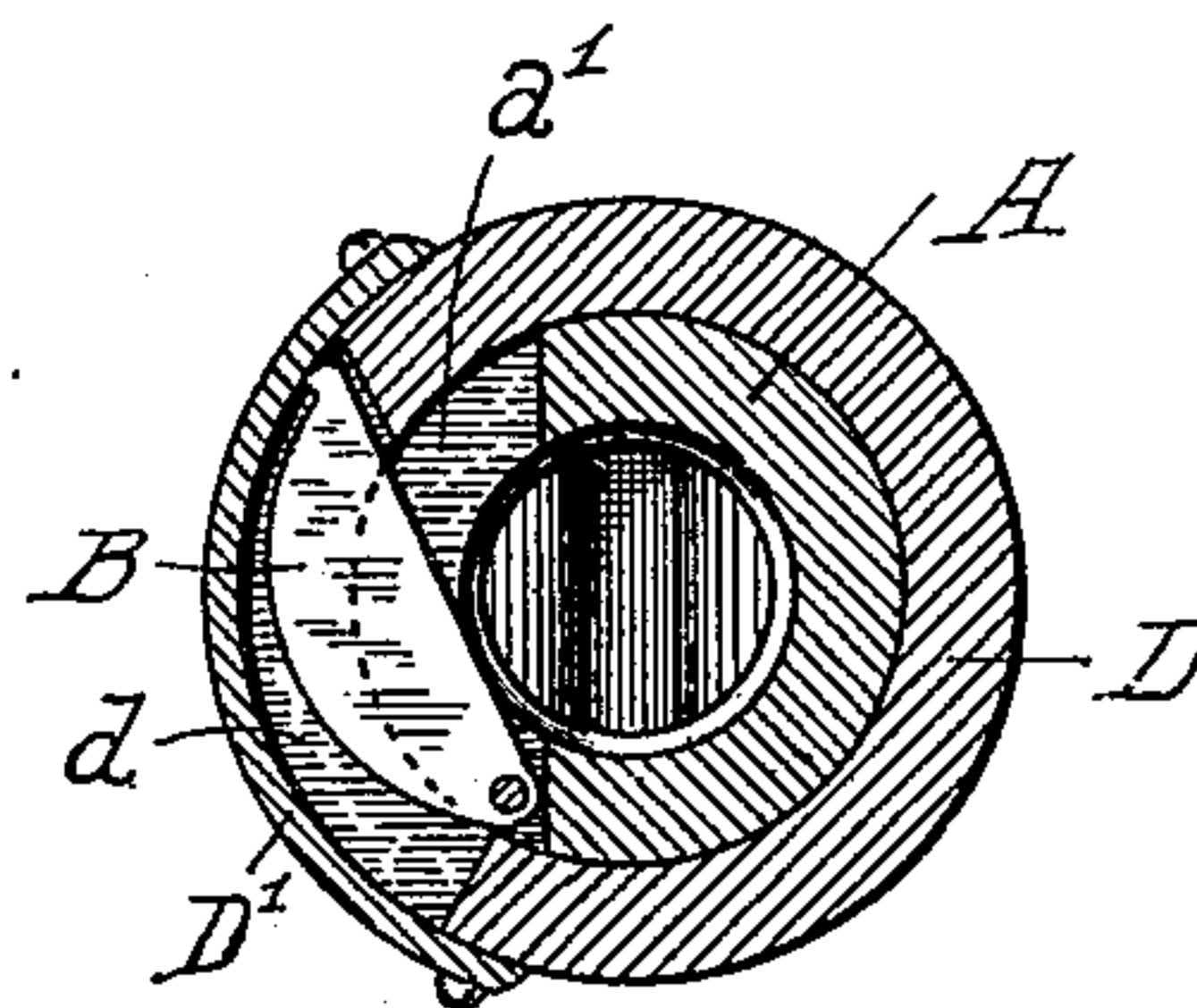


FIG. 4A.

WITNESSES,
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UNITED STATES PATENT OFFICE.

JAMES L. COOK, OF SPRINGFIELD, ILLINOIS.

TOOL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 646,489, dated April 3, 1900.

Application filed June 26, 1899. Serial No. 721,871. (No model.)

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 certain new and useful Improvements in Tool-Chucks, of which the following is such a full, clear, and exact description as will enable others skilled in the art to make and use my said invention.

My invention relates to tool-chucks of that class which employ a latch engaging in a notch in the tool for the purpose of retaining the tool in place in the chuck.

The purposes of my invention are to provide effective means for retaining the shank of the tool in the socket of the chuck in such manner as to prevent the tool from turning in the socket, also to prevent longitudinal displacement of the tool in the socket; to provide simple, effective, and positively-acting means for engaging the latch in the notch in the tool and disengaging it therefrom without the use of springs, which are subject to breakage and which soon become impaired by use; to provide means for excluding dirt and grit from the operative parts, which means also serves to limit outward movement of the latch; to provide a stock, a sleeve, and a latch so constructed and arranged relative to each other that the latch may serve to limit the rotation of the sleeve and may also serve to prevent longitudinal movement of the sleeve on the stock, and to provide a stock, a sleeve, and a latch of such form and arranged in such relation to each other that when the lower edge of the latch is engaged in the slot in the tool usable with the chuck the latch will occupy substantially the entire length of the slot in the stock, with its lower edge chordal to the socket of the stock, and the perimeter of the latch will be in contact with the inner surface of the sleeve along substantially the whole length of the latch.

With these ends in view my invention consists in the novel features of construction and combinations of parts shown in the annexed drawings, to which reference is hereby made, and hereinafter particularly described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a side elevation of the complete tool-chuck. Fig. 2 is an end elevation of the tool-chuck. Fig.

3 is an oblique longitudinal section on the line 3 3 of Fig. 2. Fig. 4 is a vertical transverse section on the line 4 4 of Fig. 1, the latch being shown in position to engage in the notch in the shank of the tool. Fig. 4^A is a vertical transverse section on the line 4 4 of Fig. 1, the latch being shown as withdrawn from the notch in the shank of the tool.

Similar letters of reference designate like parts in all of the views.

The preferable form of the stock A of the tool-chuck is as shown in Fig. 1 of the drawings; but the configuration of the stock of the chuck may be varied without departing from my invention. Within the stock A is a central bore or socket *a*, adapted to accommodate the shank of a drill or other tool. In the drawings I have shown a round tapering socket; but other forms of socket—as, for example, a round straight socket or a socket of angular or oblong cross-section—may be used without departing from my invention.

A transverse slot *a'* of such width and depth as is necessary to accommodate the latch B extends across the stock A. An annular sleeve D fits snugly around the stock A in such manner as to prevent accidental turning of the sleeve, but the user may turn the sleeve by grasping it firmly with the hand. The outer surface of the sleeve is milled, so as to afford a good handhold. The peripheral surface of the latch B conforms to the inner surface of the sleeve D, and the friction made by the latch bearing against the sleeve during the process of drilling prevents its being turned while in use.

The sleeve D is traversed by a segmental slot *d*, of the same width as the slot *a'* and of a length somewhat shorter than the length of the latch B. One end wall of the slot *d* is radial to the sleeve and the other end wall of the slot is inclined to said first-named end wall at an angle of about one hundred and twenty degrees. The free end of the latch B slides on the inclined end walls of the slot and is thereby raised, so as to lift the latch out of the transverse notch in the shank of the tool, as hereinafter explained.

The latch B is of substantially the form shown in Figs. 3 and 4. The pivotal pin of the latch is in a line which is chordal to the socket of the stock, and the perimeter of the

latch conforms to the inner surface of the sleeve along substantially the entire length of the latch. Hence the tool cannot act against the latch either to break the latch or produce strain on the pin, since the pressure of the tool will be applied through the latch against the inner surface of the sleeve.

At one end of the latch B is a lug *b*, against which the radial end wall of the slot *d* strikes when the sleeve D is turned in the direction indicated by the arrow Y, thus stopping the rotation of the sleeve as soon as the latch is seated in the transverse slot in the stock and apprising the user that the latch is in proper position to firmly hold the tool. The inner surface of the sleeve riding on the outer surface of the latch presses the latch down into the transverse notch in the tool-shank, and the lug serves to limit the rotation of the sleeve.

The lug *b* of the latch B projects beyond the periphery of the stock into the slot in the sleeve and serves to prevent longitudinal movement of the sleeve on the stock.

A screw B' screws into a hole *a*² in the end of the stock A, and a stud-pin *b'*, integral with the screw, extends through a hole in the latch B, and the latch turns on the pin. A segmental plate D' extends part way around the sleeve D, is suitably secured thereto, and serves to close the slot *d*, so as to exclude dirt and grit.

When the sleeve D is turned in the direction indicated by the arrow X, the free end of the latch B rides on the inclined end wall of the slot *d* until the latch is lifted out of the transverse slot in the tool-shank, and the lug *b*, abutting against the inner surface of the plate D, prevents further rotation of the sleeve.

When the parts are in the relative positions shown in Fig. 4, the sleeve D overlies the latch B and the inner surface of the sleeve contacts with the peripheral surface of the latch, and the sleeve prevents the raising of the latch by the turning of the tool in its socket. By reason of this feature of construction my tool-chuck is specially adapted to securely hold tools the tangs of which have been broken off, as it is obvious that when the latch B is in place in a transverse notch in the shank of a tool and the sleeve is turned to overlie the latch any torsional strain on the tool will cause the tool to press the latch against the inner surface of the sleeve and will thereby firmly bind the latch, so as to prevent the tool from turning. This feature is of great practical advantage, because it makes available for use tools of which the tangs have been broken off. Prior to my invention such tools have commonly been discarded, because tool-chucks as ordinarily constructed are not adapted to the use of such broken tools. It will be seen, then, that a material saving of tools results from the use of my improvements.

By reason of the construction and arrangement of parts which I have described lim-

ited rotation of the sleeve D in the direction indicated by the arrow Y serves to automatically engage the latch B in the transverse slot in the shank of the tool, and limited rotation of the sleeve in the direction X serves to automatically withdraw the latch from the transverse notch in the shank of the tool. The pivotal pin of the latch is in a line which is chordal to the socket of the stock, and the perimeter of the latch conforms to the inner surface of the sleeve along substantially the entire length of the latch. Hence the tool cannot act against the latch either to move the latch transversely or longitudinally or to break the latch or produce strain on the pin, since the pressure of the tool will be applied through the latch against the inner surface of the sleeve.

The pin B' is not essential to the operation of the latch and may be omitted without departing from my invention.

By reason of the perimetral surface of the latch conforming to the inner surface of the sleeve the latch may, if the pin is omitted, coincidentally with the turning of the sleeve turn in the angle between the inner surface of the sleeve and the bottom of the slot in the stock. Hence the turning of the sleeve will not displace the latch. When the latch is in its closed position, the inner surface of the sleeve contacts with the perimetral surface of the latch to prevent independently of the pin B' either longitudinal or transverse movement of the latch.

I am aware that an oscillative spring-actuated latch adapted to enter a longitudinal slot in the shank of the tool has heretofore been used in tool-chucks. I therefore do not claim, broadly, the use of an oscillative latch.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a chuck, the combination of a stock having a central socket and a segmentally-transverse slot cutting into said socket and adapted to accommodate the body of a latch, a sleeve turnable on said stock and having a segmentally-transverse slot adapted to accommodate the body of a latch and registrable with the slot in said stock, and a latch filling the slot in said stock and having a perimetral surface contacting with the inner surface of the sleeve contiguous to both extremities of the latch, substantially as set forth.

2. In a tool-chuck, a latch having a lug at its free extremity, in combination with a stock having a central bore and having a slot transverse to said stock in which said latch is mounted to oscillate, a sleeve turnable on said stock and having a peripheral slot, one end wall of which engages with the lug of said latch to turn the latch inward and on the other end wall of which the free end of the latch rides to raise the latch outward, and a plate secured to said sleeve and limiting the outward movement of said latch, as set forth.

3. In a tool-chuck, the combination of a stock having a transverse slot, a sleeve turn-

able on said stock and having a slot registrable with the slot in said stock, and a latch fitting in the slots in said stock and said sleeve and having a lug extending beyond the periphery of the stock into the slot in the sleeve and adapted to prevent longitudinal movement of the sleeve on the stock, substantially as set forth.

4. In a tool-chuck, the combination of a stock having a socket and a slot transverse to said socket, a sleeve turnable on the stock and having a slot registrable with the slot in said stock, and a latch having a lug and mounted to oscillate in the slots in said stock and said sleeve, the end walls of the slot in said sleeve being adapted to engage with the lug on said latch, substantially as set forth.

5. In a tool-chuck, the combination of a

stock having a socket, and having a transverse slot cutting into said socket, a sleeve turnable on said stock and having a slot registrable with the slot in said stock, and a latch having a lug and mounted to oscillate in the slots in said stock and said sleeve and adapted to limit the rotation of the sleeve by an end wall of the slot in the sleeve abutting against the lug on the latch when the latch is seated in the slot in the stock, substantially as set forth.

In witness that I claim the foregoing I have hereunto subscribed my name, at Springfield, Illinois, this 23d day of June, 1899.

JAMES L. COOK.

Witnesses:

HENRY BUNN,
HENRY B. NOUSE.