

(No Model.)

J. E. REDIN & C. A. WESSMAN.
DRILL CHUCK.

No. 597,328.

Patented Jan. 11, 1898.

Fig. 1.

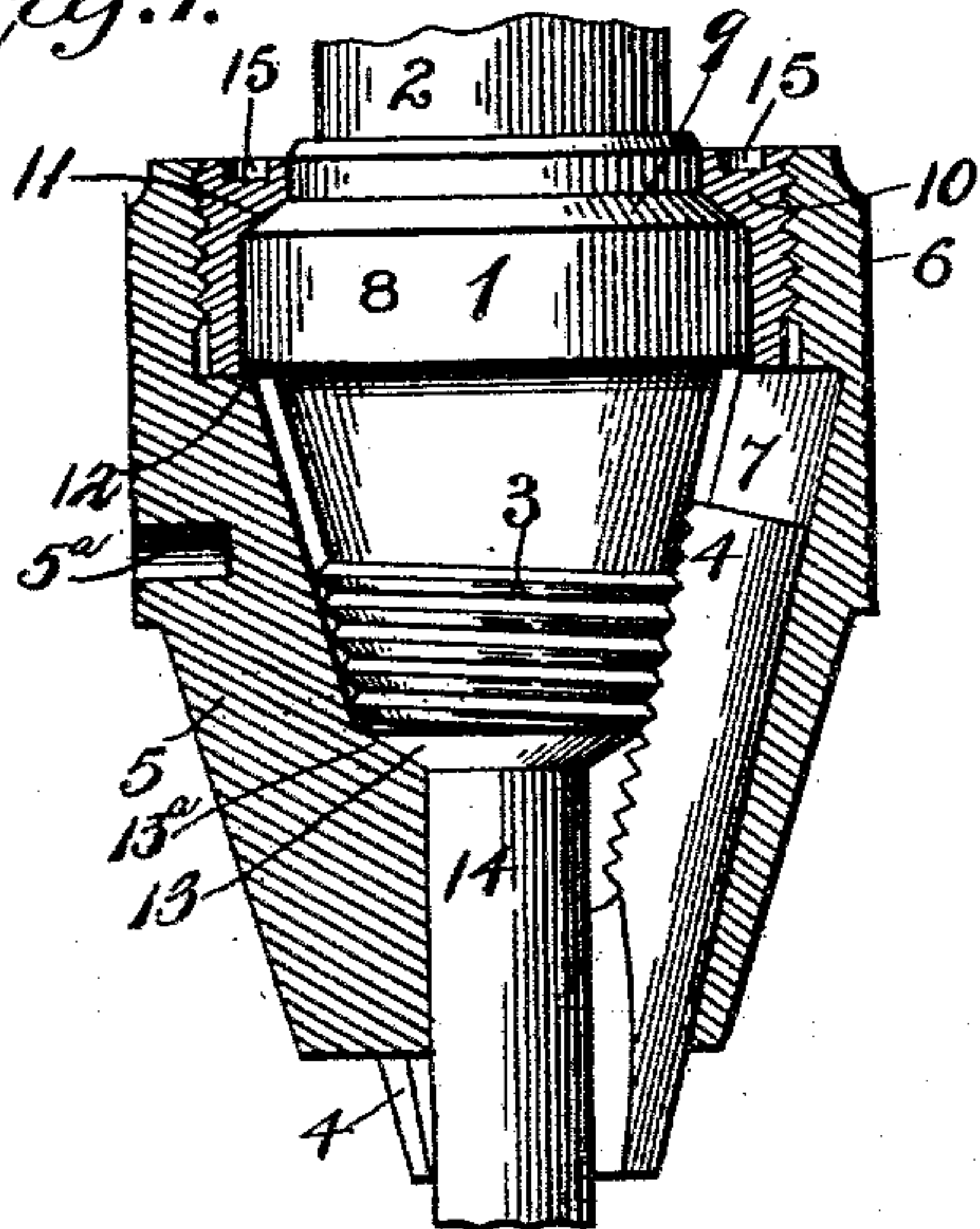


Fig. 2.

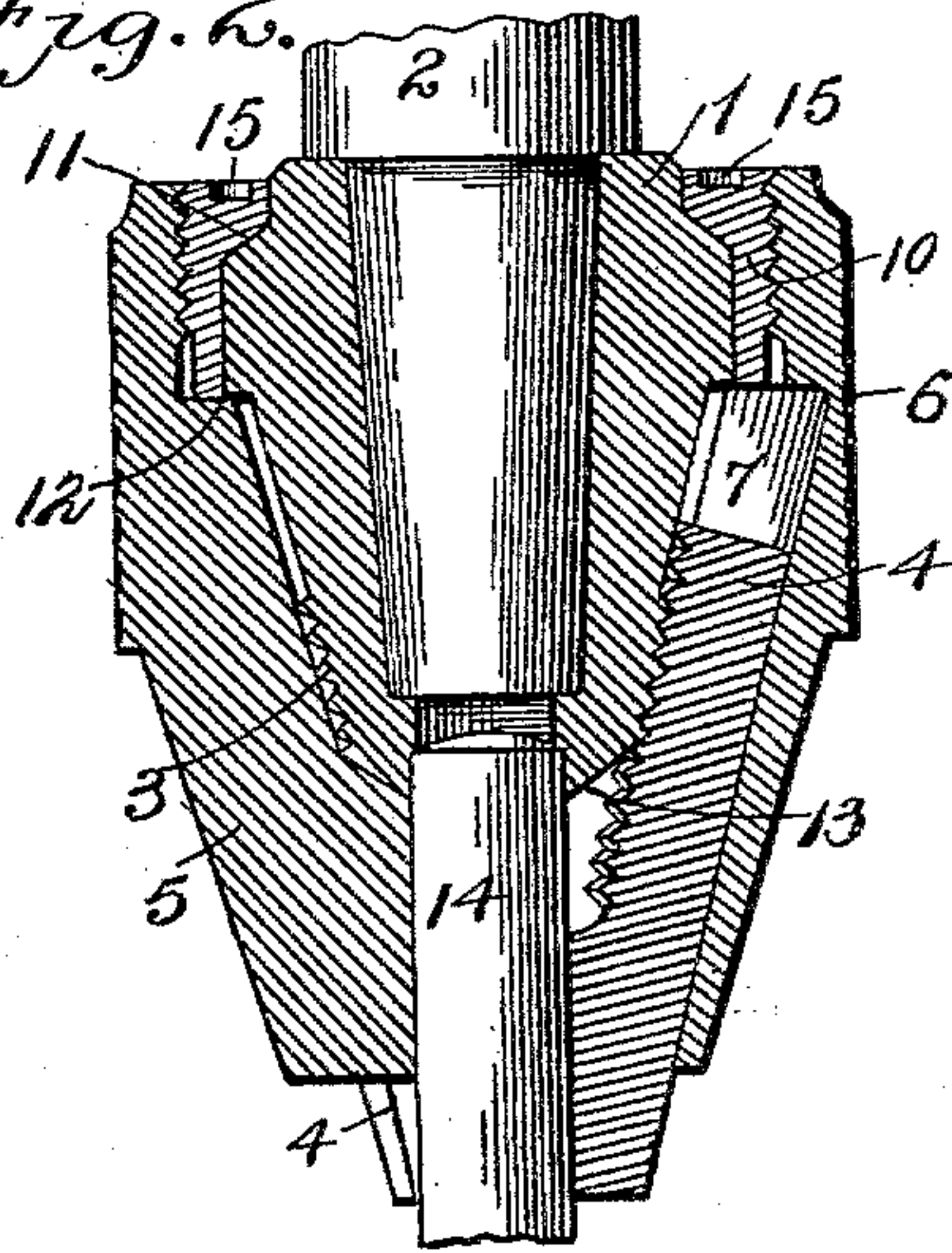


Fig. 3.

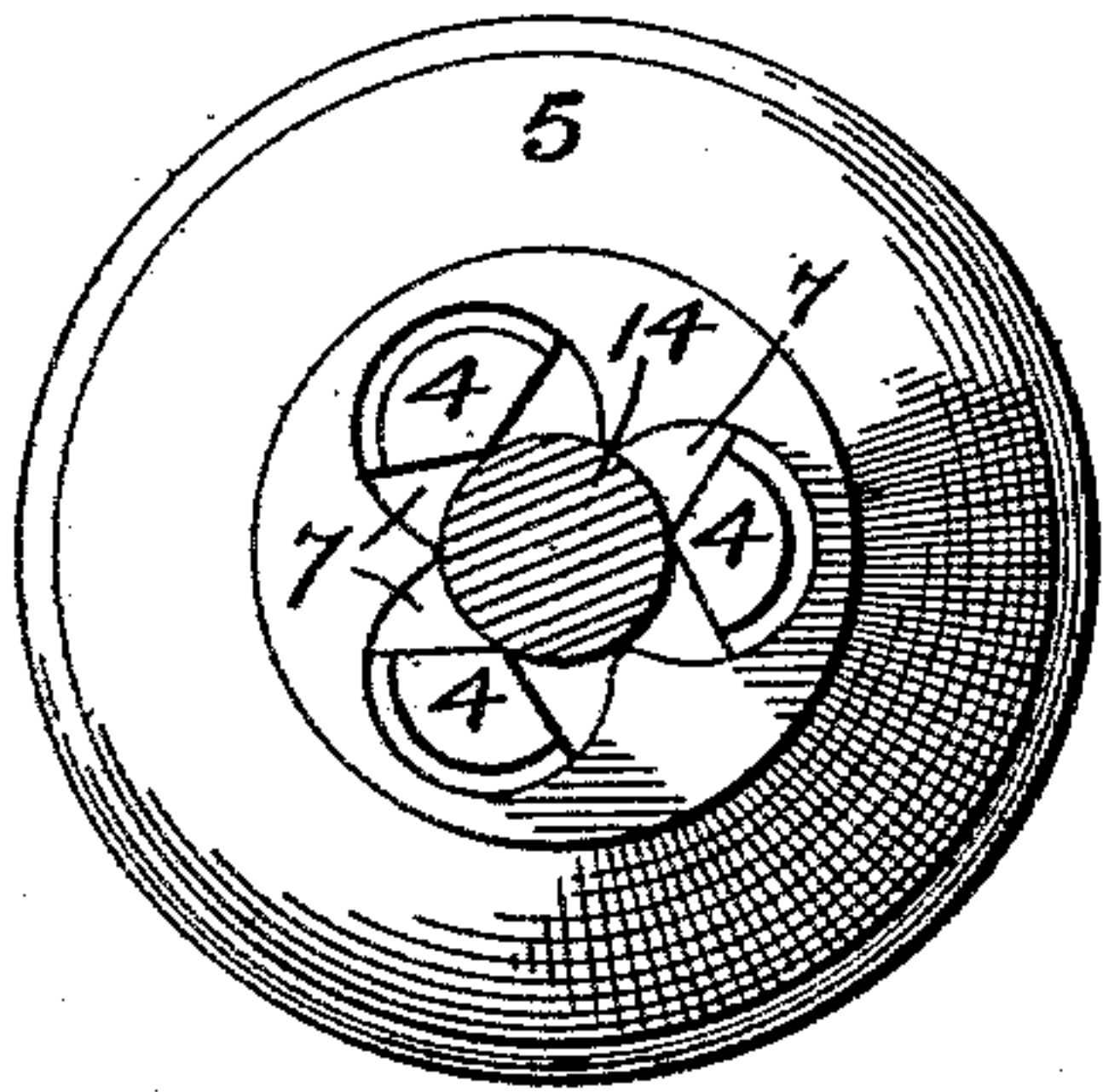


Fig. 4.

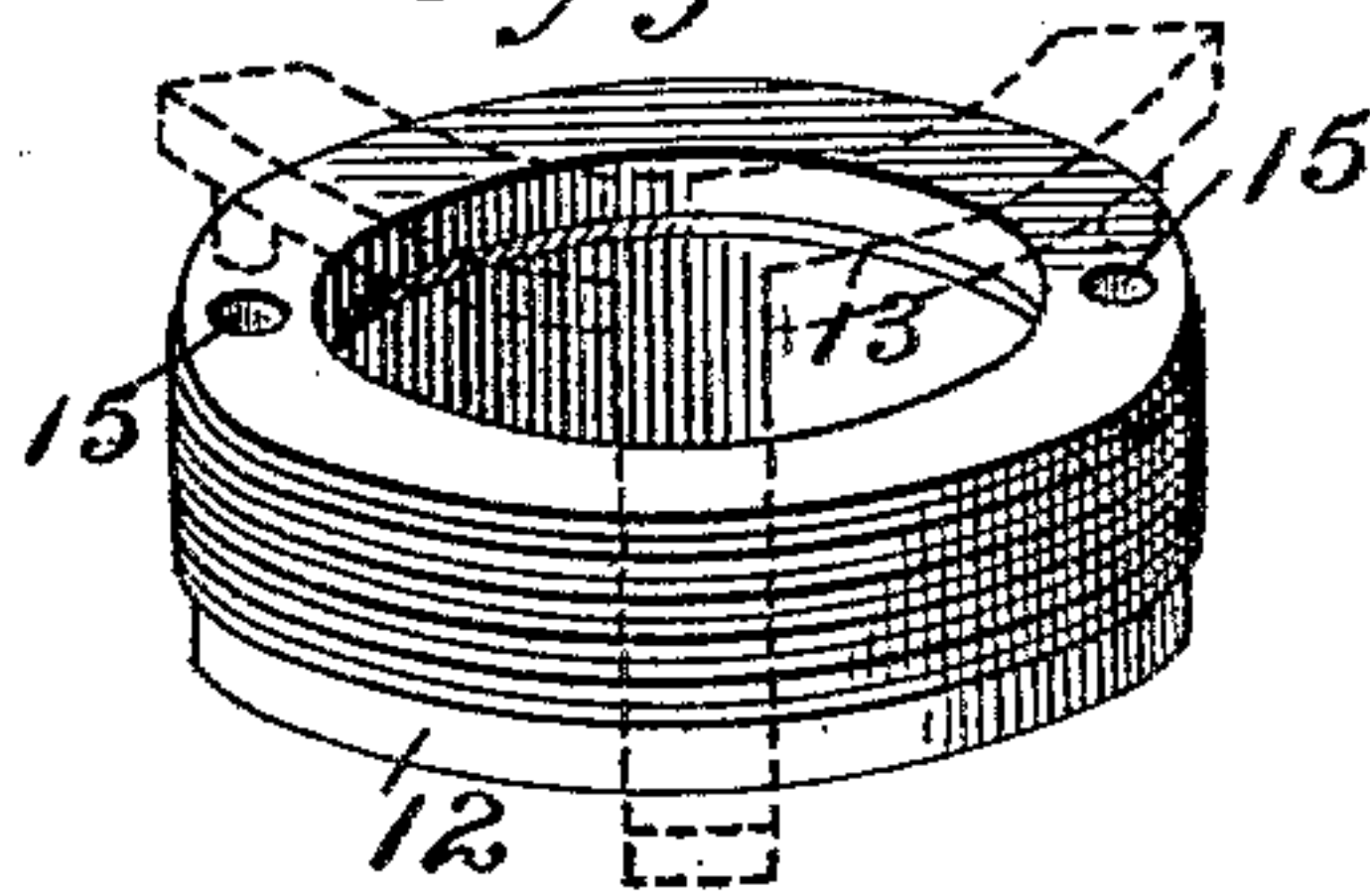


Fig. 5.

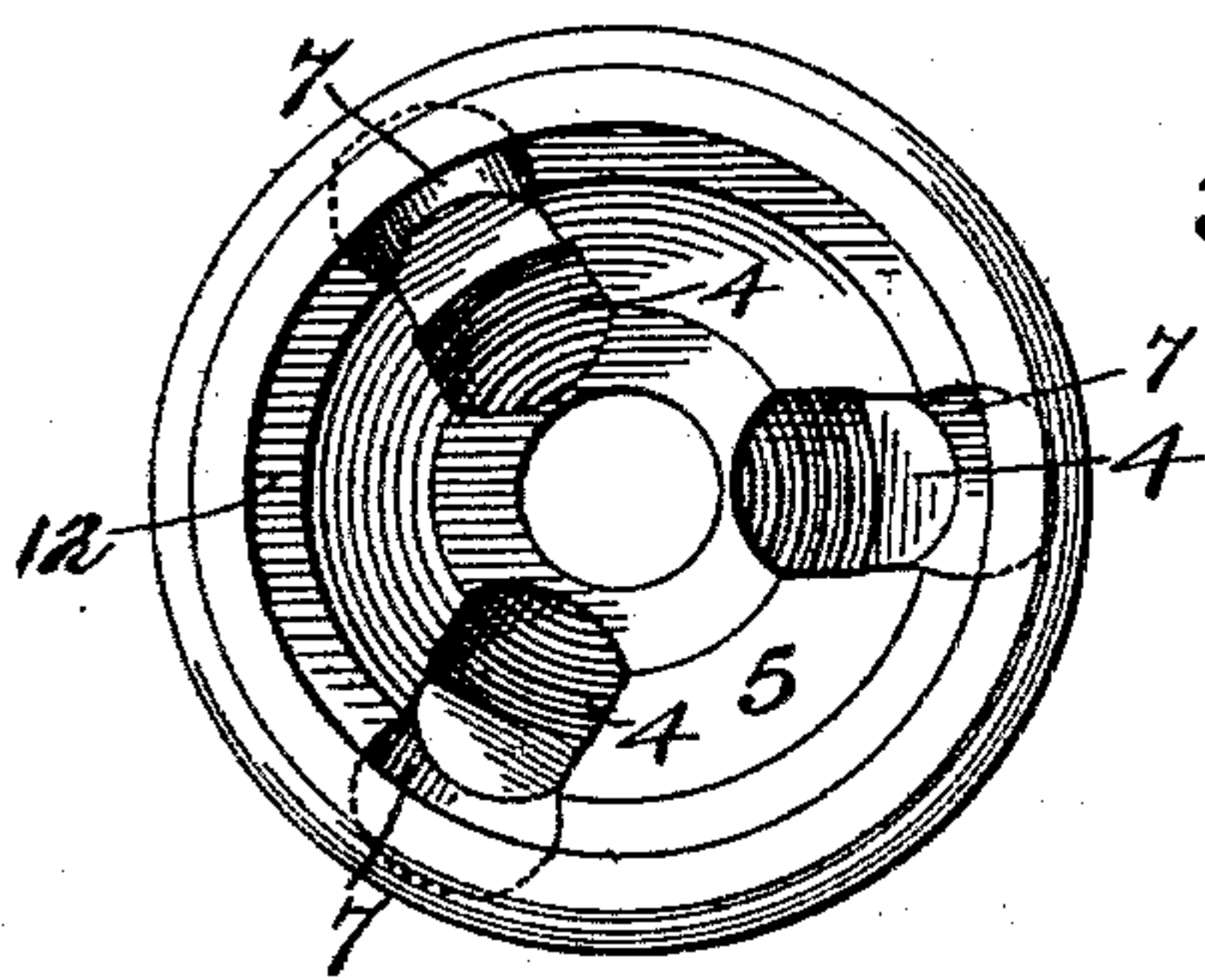


Fig. 7.

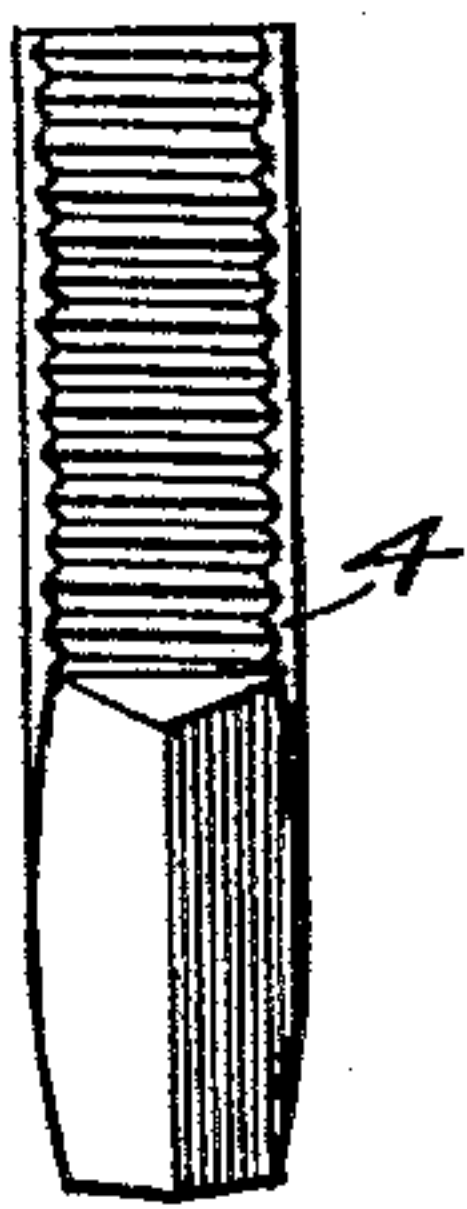
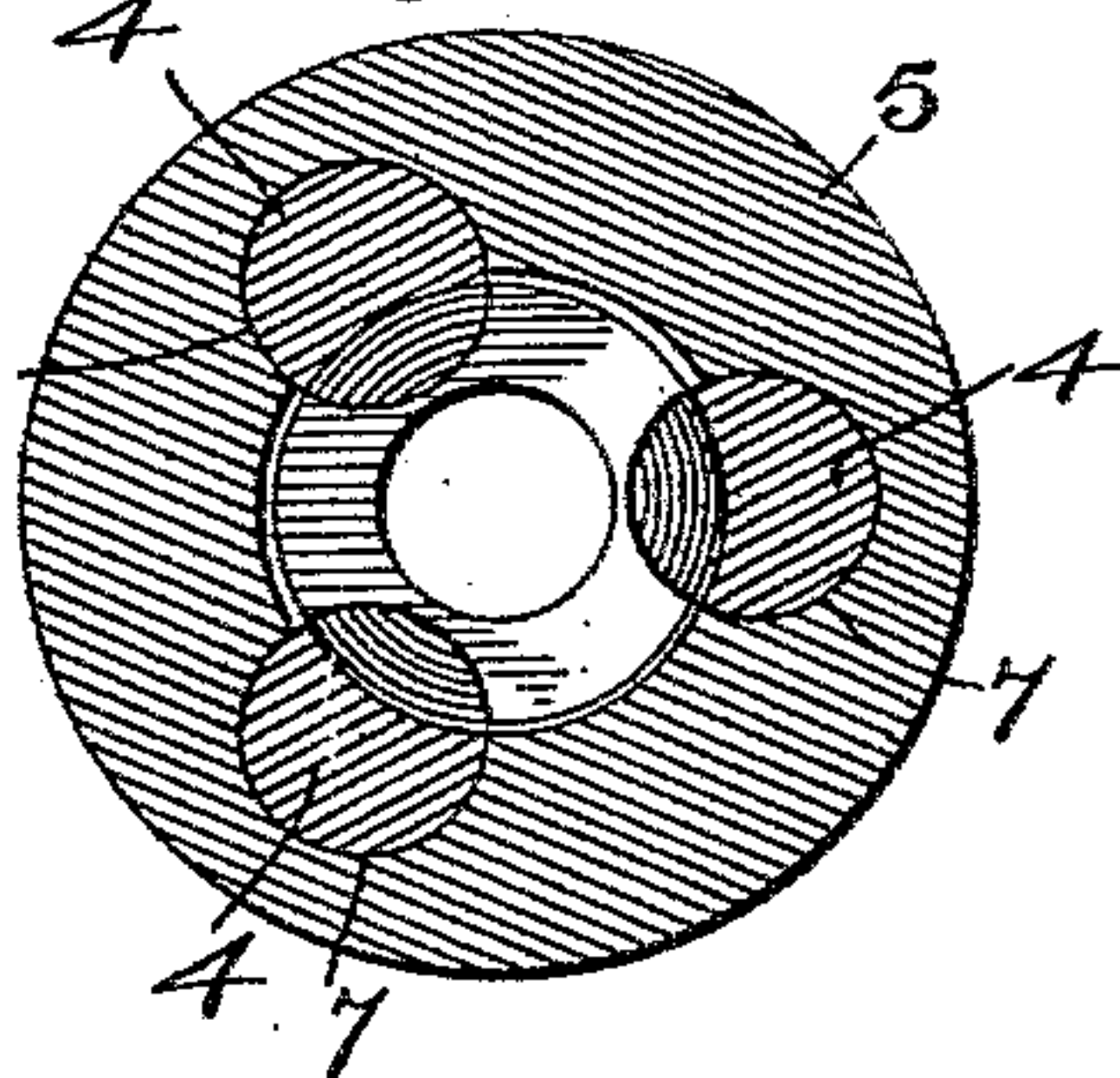


Fig. 6.



Witnesses
Edwin G. McKee
[Signature]

By their Attorneys,

Inventors
John E. Redin and
Carl A. Wessman.

[Signature]

UNITED STATES PATENT OFFICE.

JOHN E. REDIN AND CARL A. WESSMAN, OF ROCKFORD, ILLINOIS.

DRILL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 597,328, dated January 11, 1898.

Application filed May 26, 1897. Serial No. 638,268. (No model.)

To all whom it may concern:

Be it known that we, JOHN E. REDIN and CARL A. WESSMAN, citizens of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented a new and useful Drill-Chuck, of which the following is a specification.

Our invention relates to drill-chucks, and has for its object to provide a simple and efficient construction and arrangement of parts whereby the desired adjustment of the jaws may be secured with the minimum effort and loss of time by experiment and whereby the jaws may be locked effectually in their adjusted positions.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a longitudinal section of a drill-chuck constructed in accordance with our invention, the plug being shown in side view. Fig. 2 is a similar view showing the plug in section. Fig. 3 is an end view. Fig. 4 is a detail view in perspective of the bushing-ring. Fig. 5 is a plan view of the screw-sleeve, viewing the same from the inner or larger end. Fig. 6 is a transverse section of the same. Fig. 7 is a detail view of one of the chuck-jaws detached.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates a head or plug having a tapered bore for the reception of the extremity of a drill-chuck spindle 2, said plug being exteriorly of frusto-conical construction, with a threaded portion 3 at its reduced extremity to engage the threaded surfaces of the outwardly-convergent chuck-jaws 4.

Inclosing the plug is a screw-sleeve 5 of exterior and interior frusto-conical construction, with a milled cylindrical surface forming a grip 6, and the wall of this sleeve is interiorly grooved to form a plurality of guides 7 for the said jaws 4. In the construction illustrated three jaws are employed, the same being over half-round in cross-section to fit the said guides, which also exceed a semi-cylinder in cross-section, whereby displacement of the body portions of the jaws is prevented.

The body portions of the jaws are threaded to correspond with the feed-screw formed by the outer end of the plug, whereby when the screw-sleeve is rotated the feed-screw operates upon the jaws to either extend or retract them gradually and thereby either contract or expand the same, the inclined positions of the guides causing the longitudinal extension of the jaws to produce transverse contraction.

The plug is enlarged to form a collar 8, of which the inner edge is beveled to form a shoulder 9, constituting a cone-bearing, and threaded into the enlarged or inner end of the screw-sleeve is a bushing-ring 10, having a beveled shoulder or flange 11 to engage the beveled shoulder of the plug, the lower edge of said bushing-ring bearing firmly upon an annular shoulder 12, formed in the inner wall of the screw-sleeve. The plug is also provided, in addition to the inwardly-contracted cone-bearing 9, with an outwardly-contracted cone-bearing 13, engaging a seat 13^a in the screw-sleeve, which corresponds with the seat formed by the flange 13. These cone-bearing surfaces hold the screw-sleeve against longitudinal or axial movement with relation to the plug during the rotation of the screw-sleeve to adjust the jaws. It is obvious that when the shank 14 of a bit is arranged between the jaws and the screw-sleeve has been turned to contract the jaws into contact with said shank the tightening of the screw-sleeve will firmly lock it against accidental displacement. In order, however, to insure the positive engagement of the jaws with a bit-shank, we preferably provide the milled body portion of the screw-sleeve with a socket 5^a, adapted to receive a key or wrench to assist in turning the sleeve in the direction necessary to contract the jaws and also to facilitate the expansion of the jaws when it is desired to remove the bit-shank.

The bushing-ring is adapted to be screwed tightly to place with its outer edge bearing upon the shoulder 12 while leaving the screw-sleeve free to rotate around the screw-plug and carrying with it said bushing-ring, and in order to facilitate the firm seating of the bushing-ring in the inner end of the screw-sleeve we preferably provide it with sockets 15 for engagement by the pins or studs of a wrench,

such as that which is illustrated in dotted lines in Fig. 4, or the equivalent thereof. It is obvious that the bushing-ring turns with the screw-sleeve and that the principal function of the bushing-ring is to form an outer bearing for the screw-sleeve upon the plug while facilitating the mounting of the screw-sleeve upon the plug.

A further important function of the plug, however, is that when the cone-bearings 9 and 13 or the corresponding seats in the screw-sleeve (of which the bushing-ring may be considered a detachable part) become worn and thereby allow axial movement of the screw-sleeve the bushing may be removed and the outer edge thereof turned off to reduce the interval between the seat 11 and the seat 13^a, thereby taking up lost motion.

In the drawings the feed-screw or threaded portion 3 of the plug is shown of the left-hand type for the reason that it provides for the longitudinal extension and transverse contraction of the jaws by the right-hand turning of the screw-sleeve, and hence under ordinary circumstances is preferable; but it will be understood that this may be varied to suit the demands of the users, and that various other changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is—

1. A drill-chuck having a taper-plug provided with inner and outer oppositely-positioned bearing-shoulders, a screw-sleeve fitted for rotation upon the plug and provided with corresponding inner and outer oppositely-positioned seats to receive the shoulders of the plug, one of said seats being formed in a removable bushing-ring, and jaws fitted to slide in outwardly-convergent guides in one of said parts and having a threaded engagement with the other part, substantially as specified.

2. A drill-chuck having a taper-plug and an inclosing sleeve provided with opposing inner and outer bearing-shoulders, one of which is carried by an axially-movable section of said sleeve, and jaws mounted to slide in outwardly-convergent guides on one of said parts

and having a threaded engagement with the other part, substantially as specified.

3. A drill-chuck having a taper-plug adapted to be carried by a spindle and provided at its inner end with an inwardly-contracted beveled bearing-shoulder, and near its outer end with an outwardly-contracted beveled bearing-shoulder, a screw-sleeve fitted for rotation upon the plug and having bearing-seats adapted, respectively, to receive the bearing-shoulders of the plug, one of said seats being carried by an axially-movable section of the sleeve, and jaws fitted to slide in outwardly-convergent guides in one of said parts and having a threaded engagement with the other part, substantially as specified.

4. A drill-chuck having a taper-plug provided with inner and outer oppositely-beveled bearing-shoulders, a screw-sleeve fitted for rotation upon the plug and provided with corresponding inner and outer oppositely-beveled seats to receive the shoulders of the plug, one of said seats being formed in a removable bushing-ring, and jaws fitted to slide in outwardly-convergent guides in one of said parts and having a threaded engagement with the other part, substantially as specified.

5. A drill-chuck having a taper-plug adapted to be carried by a spindle and provided with inner and outer oppositely-beveled bearing-shoulders, a screw-sleeve fitted for rotation upon the plug and having inner and outer oppositely-beveled seats to receive the bearing-shoulders of the plug, one of said seats being formed in the body portion of the screw-sleeve, which is recessed at its inner end, and the other seat being formed in a removable bushing-ring, adjustably fitted in said recess in the inner end of the body portion of the screw-sleeve, and jaws fitted to slide in outwardly-convergent guides in the screw-sleeve and having a threaded engagement with the taper-plug, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

JOHN E. REDIN.

CARL A. WESSMAN.

Witnesses:

CARL A. NEWBURG,

FRANK P. NEWBURG.