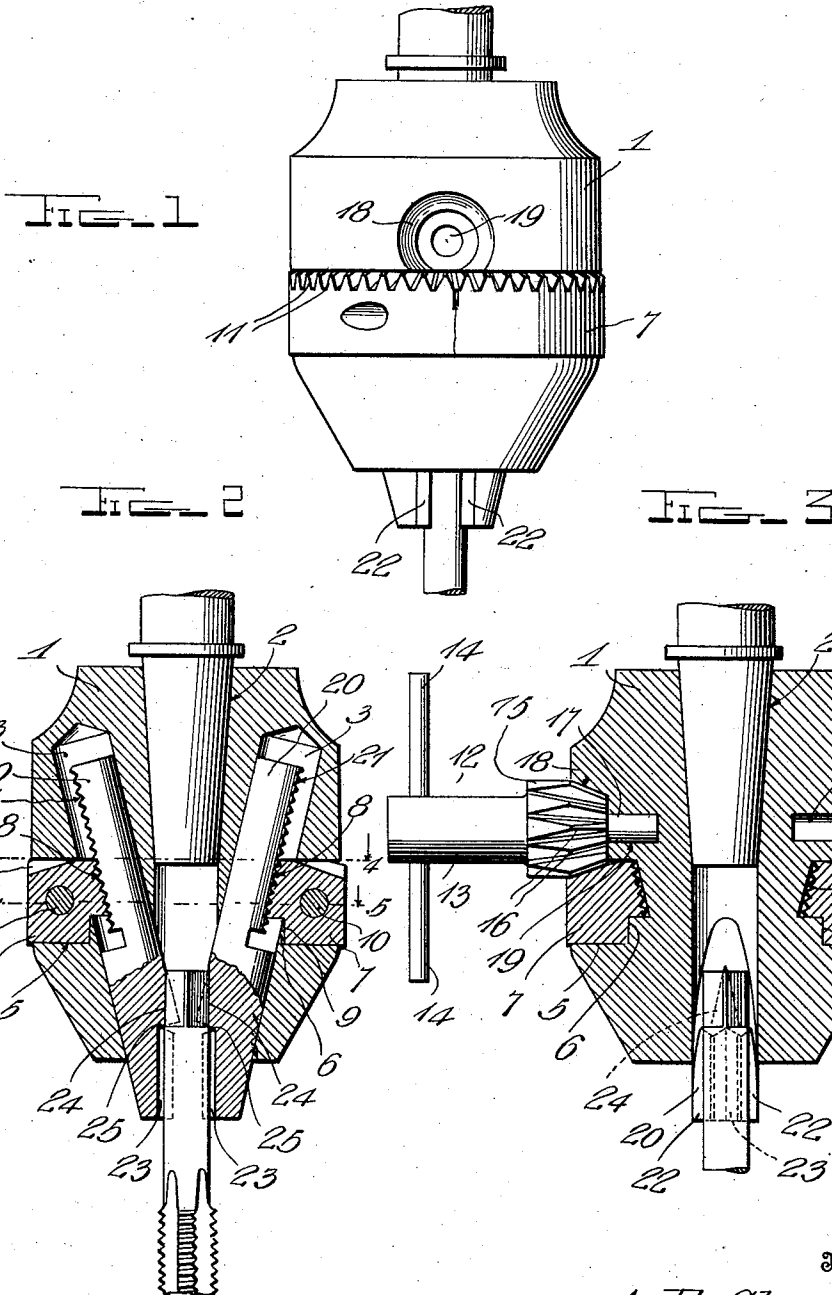


A. E. CHURCH.
 DRILL CHUCK.
 APPLICATION FILED JULY 22, 1912.

1,061,934.

Patented May 13, 1913.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

FIG. 4

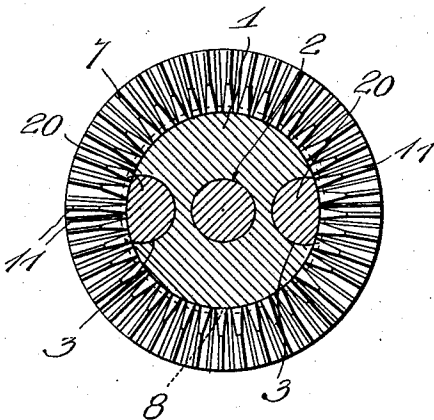


FIG. 5

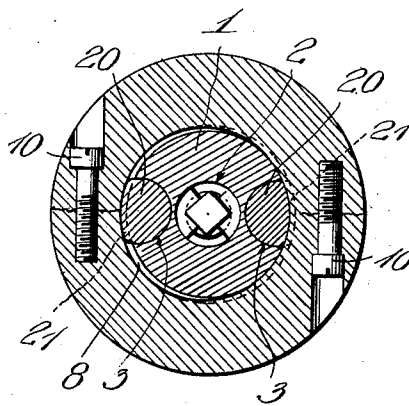


FIG. 6

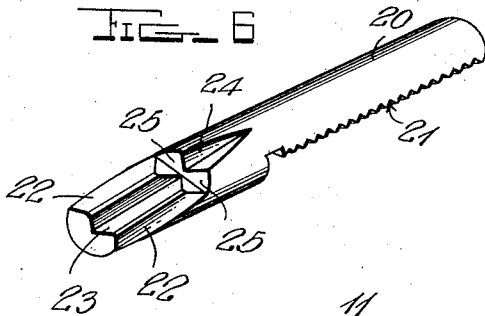


FIG. 7

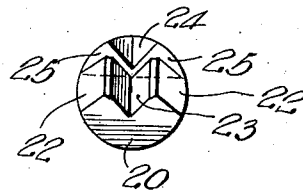
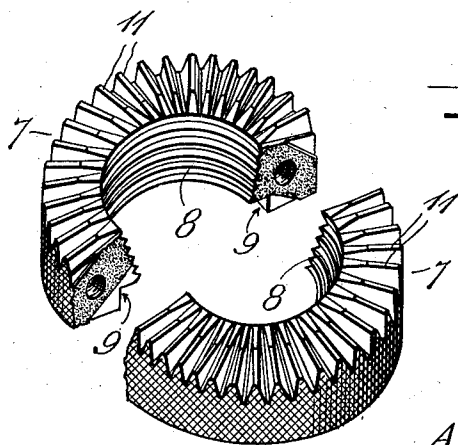


FIG. 8



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UNITED STATES PATENT OFFICE.

ALBERT E. CHURCH, OF NEW BRITAIN, CONNECTICUT.

DRILL-CHUCK.

1,061,934.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed July 22, 1912. Serial No. 710,936.

To all whom it may concern:

Be it known that I, ALBERT E. CHURCH, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Drill-Chucks; and I do 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.

This invention relates to improvements in chucks for drills, taps and similar tools.

One object of the invention is to provide a chuck of this character having an improved construction and arrangement of bit gripping jaws whereby the bit or tool may be gripped on its squared inner end and along substantially the entire length of the shank of the bit thereby throwing all of the strain on the solid metal parts of the chuck body instead of on the working parts as in the usual construction of chucks.

Another object is to provide an improved construction and arrangement of jaw operating nut adapted to be operatively secured to the body of the chuck without employing the usual retaining sleeve.

With these and other objects in view, the invention consists of certain novel features of construction, and the combination and arrangement of parts as will be more fully described and claimed.

In the accompanying drawings; Figure 1 is a side view of my improved chuck; Fig. 2 is a central longitudinal section showing a tap bit gripped by the jaws of the chuck; Fig. 3 is a similar view taken at right angles to Fig. 2 and showing the hand operating key in operative position; Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2; Fig. 5 is a similar view taken on the line 5—5 of Fig. 2; Fig. 6 is a detail perspective view of one of the jaws; Fig. 7 is an end view thereof; Fig. 8 is a detail perspective view of the jaw adjusting nut showing the broken sections of the same separated.

Referring more particularly to the drawings, 1 denotes the body of my improved chuck, said body being of substantially cylindrical form and having its outer end tapered and its inner end reduced as shown. The body 1 is provided with a centrally disposed bore or passage 2 adapted to receive the customary shank by means of which the chuck is attached to a drill press or other

machine. In the body 1 are also formed diagonally disposed converging jaw receiving sockets 3 which extend into the body for a suitable distance and which communicate at their outer ends with the bore or passage 2 as shown. In the body 1 is formed an annular groove or recess 5 which intersects the jaw receiving sockets 3 and on the outer wall of which is an annular offset or shoulder 6.

Revolubly mounted in the annular groove or recess 5 is a jaw operating nut 7 in the form of a ring having its knurled outer surface disposed substantially flush with the outer surface of the body and having its inner side threaded as at 8 to engage the threaded portions of the jaws whereby the latter are projected and retracted as will be hereinafter more fully described. The threaded surface of the nut 7 is slightly tapered to correspond with the angle or inclination of the jaws which work in the sockets 3. The inner wall of the nut 7 below the threaded portion 8 thereof is offset to form an annular recess 9 which engages the annular shoulder 6 on the inner wall of the groove 5 whereby said nut or ring is centered in the body of the chuck.

In order to permit the nut to be engaged with the groove or recess 5 said nut is divided into two semi-circular sections secured together at their ends by retaining screws 10 which are engaged with passages formed in one end of the semi-circular sections of the nut and have a threaded engagement with threaded sockets in the opposing ends of the nut sections. In dividing the nut or ring 7 the same is preferably sawed for a slight distance at diametrically opposite points and is then broken at the place where the same were sawed as clearly shown in Fig. 8 of the drawings. In the inner or upper side of the nut are formed an annular series of crown gear teeth 11 with which are adapted to be engaged a suitable key or wrench 12 whereby the nut is revolved in one direction or the other for projecting or retracting the gripping jaws of the chuck.

The wrench 12 comprises a shank having in its outer end right angularly projecting handles 14 and on its inner end a cylindrical head 15 provided with an annular series of crown gear teeth 16. On the head 15 is a reduced bearing stud 17. In the body 1 of the chuck at diametrically opposite points are radially disposed re-

cesses 18 the walls of which preferably taper inwardly and communicating with the inner ends of which are radial sockets 19 which extend back into the body for a suitable distance as shown. The inner sides of the recesses 18 are intersected and cut off by the annular groove 5, so that the crown gear teeth 11 of the nut are exposed in the cut-away portions of the recesses 18. By thus forming the groove 5 and the recesses 18 it will be seen that when the key or wrench is engaged with either of said recesses the bearing stud 17 on said head will enter the bearing sockets 19 and will form a bearing for the wrench or key whereby the latter may be readily revolved, thus engaging the toothed head thereof with the crown gear teeth of the nut, and revolving the latter in one direction or the other to project or retract the gripping jaws.

The chuck may be provided with two or more tool or bit gripping jaws, the same being shown in the present instance as provided with two oppositely disposed co-acting jaws 20. The jaws 20 are of cylindrical form and have the upper portions of their outer sides recessed and threaded as at 21, said threaded surface being formed in the arc of a circle corresponding substantially to the circular threaded inner surface of the nut 7 with which said threaded portions of the jaws are engaged. The outer ends of the jaws 20 on the inner or opposite sides thereof from the threaded portion are offset and formed on a long bevel or incline toward the ends of the jaws and said offset or inclined surfaces are beveled longitudinally on their edges as at 22 and between said surfaces 22 are formed longitudinal V-shaped grooves 23 which communicate at their inner ends with similar V-shaped grooves 24, said grooves 24 forming practically a continuation of the grooves 23, the latter however, being of less depth than the grooves 24 owing to the bevel or inclination of the inner side of the outer ends of the jaws. At the inner ends of the beveled portions 22 are formed square stop shoulders 25. By thus constructing the outer ends of the jaws it will be seen that when a drill bit or threading tap is engaged with the chuck the V-shaped grooves in the parallel beveled surfaces of the jaws will grip the cylindrical portion of the body shank, while the shorter deeper grooves 24 will firmly grip the square inner end of the shank, said jaws thus obtaining a double grip on the shank of the tool or bit. The engagement of the long grooves 23 with the shank of the bit serves to center and firmly grip the bit while the engagement of the grooves 24 with the squared inner end of the bit shank forms the driving connection between the chuck

and the bit. By means of this double grip the working parts of the chuck are relieved from strain which is now applied to the solid body portion of the chuck.

While the above described arrangement is the preferred manner in which the shank is gripped by the jaws of the chuck, it is obvious that if desired the square inner end of the body shank may be gripped by the outer ends of the V-shaped grooves of the jaws in the usual manner.

From the foregoing description taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction within the scope of the appended claims may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as claimed.

Having thus described my invention, what I claim is;

1. In a chuck, a body having converging jaw receiving sockets and an annular groove intersecting said sockets, bit gripping jaws slidably mounted in said sockets and having threaded outer surfaces, a nut revolvably mounted in said groove and having its inner surface threaded to fit the threads on said jaws, said nut being formed in sections, said sections having in one end a screw hole and in their other end a threaded socket, screws engaged with said holes and sockets whereby said sections of the nut are fastened together in said groove, an annular series of gear teeth on said nut and a key having a toothed head to engage the teeth on said nut whereby the latter is revolved to project and retract said jaws.

2. In a chuck of the character described, a body having converging jaw receiving sockets, and an annular groove intersecting said sockets, bit gripping jaws slidably mounted in said sockets and having recessed rounded outer surfaces on their inner ends, said surfaces being threaded, long offset beveled gripping surfaces on the inner sides of the outer ends of the jaws, said surfaces having therein longitudinal grooves to grip the shank of a bit, said grooves being extended at their inner ends to grip and form a driving connection with the square inner end of the bit and stop shoulders at the inner ends of said beveled surfaces of the jaws.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALBERT E. CHURCH.

Witnesses:

I. R. DUTTING,
M. A. TAYLOR.