(No Model.)

J. S. CHURCH.

DRILL CHUCK.

No. 310,987. Patented Jan. 20, 1885.

Fig. 1.

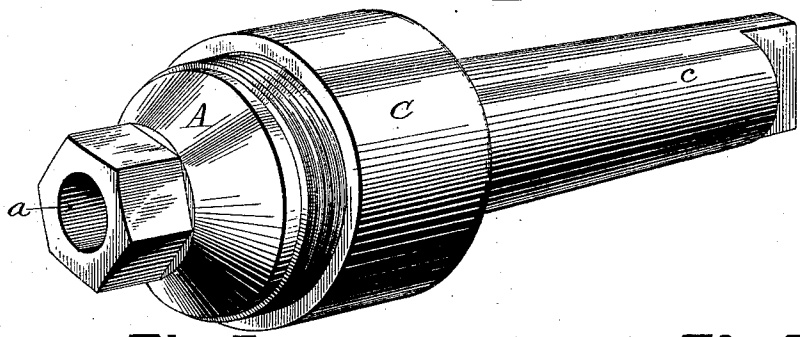


Fig. 2.
on line x-x

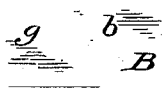


Fig. 3.
on line y-y

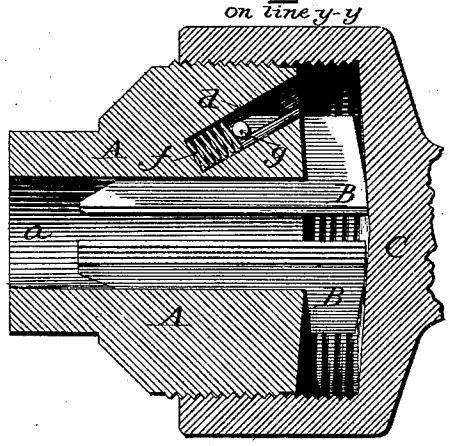


Fig. 4.
on line z-z

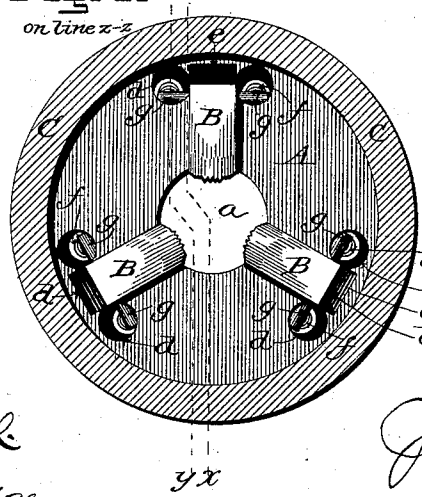


Fig. 5.

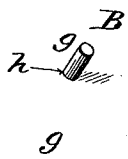
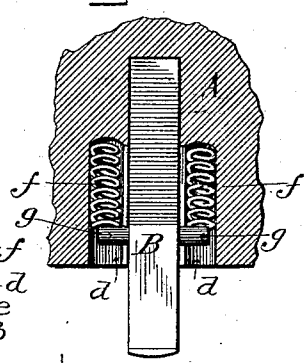


Fig. 6.



WITNESSES.

Jas. F. DeKamel.

Walter S. Dodge.

INVENTOR.

James S. Church,
by Dodgeson
Atty

UNITED STATES PATENT OFFICE.

JAMES S. CHURCH, OF MILWAUKEE, WISCONSIN, ASSIGNOR OF ONE-HALF TO GEORGE M. HINKLEY, OF SAME PLACE.

DRILL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 310,987, dated January 20, 1885.

Application filed April 4, 1884. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. CHURCH, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain Improvements in Drill-Chucks, of which the following is a specification.

My invention relates to lathe-chucks and tool-holders; and it consists in various features and details of construction hereinafter fully pointed out.

Figure 1 is a perspective view of my improved chuck; Fig. 2, a longitudinal section on the line *x x* of Fig. 4; Fig. 3, a similar section on line *y y* of said figure; Fig. 4, a transverse section on the line *z z* of Fig. 2; Fig. 5, a perspective view of one of the jaws of the chuck, removed from the shell or body; Fig. 6, a sectional view showing the manner of applying the springs which press back the jaws.

The purpose of my invention is to produce a self-centering chuck of cheap and durable construction, and with this object in view I make it as follows:

A indicates a head or body, having a central hole or opening, *a*, to receive a drill or other tool, and provided with radial slots *b* to receive jaws B, which have both longitudinal and transverse or radial movements in said body. The forward or outer end of body A is made polygonal in form to receive a wrench or other implement by which it may be held or turned as required. The body or head A is threaded on its exterior to screw into a correspondingly-threaded shell, C, which may be provided with an internally-threaded neck to screw upon a lathe-mandrel, but is preferably formed with a tapering stem or shank, *c*, as shown in Fig. 1, to fit within the hollow mandrel of a lathe. The radial slots or recesses *b*, of which there are preferably three, are arranged at equal distances apart, and their forward ends are inclined or beveled toward the center as they approach the front or outer end of the body, to form bearing-faces for the correspondingly-beveled ends of the jaws B, as plainly shown in Fig. 2. At each side of the slots *b*, and opening through the walls or sides thereof, are holes or cavities *d*, inclined in the same direction as the beveled or inclined faces *e* of the slots *b*, and serving to contain spiral springs *f*, as shown in Figs. 3, 4, and 6. Each jaw is provided with lugs or projections *g*, which may be conveniently formed by the projecting ends of a pin, *h*, passing transversely through the jaws, as shown in Figs. 4, 5, and 6. The inner or rear end of the jaws project some distance beyond the inner end of head or body A, and are rounded somewhat to rest upon and to be readily moved by the shell or cap C, the inner face or end of which bears directly against said inner end of the jaws, and causes them to move forward in their slots or seats when the shell is screwed upon the body. As the jaws are thus moved forward their beveled front ends ride upon the similarly-inclined faces *e* of the slots, causing the jaws to move inward in radial lines simultaneously and equally, and thus to the center, and firmly clamp the tool or article placed within the opening *a*. The small end of stem or shank *c* is flattened for convenience in holding it with a tool of any suitable kind, and hence the shell may be held and the body turned, or the body held and the shell turned, to operate the chuck. When the jaws move forward, the lugs or pins *g* bear upon and compress the springs *f*, which expand when the cap or shell is unscrewed and press the jaws backward, the lugs or pins traveling in the spring-cavities and thus causing the jaws to move outward as well as backward.

It is to be particularly noted that the jaws, and the head or body A in which they are mounted, have no connection with the shell or body other than the thread or screw by which one screws into the other; hence if a rod, drill, wire, or other article be clamped in the chuck and the chuck be applied to and caused to rotate with a lathe-mandrel in the direction for operating upon or with said article, there will be a constant tendency for the body to screw into the shell, and hence for the jaws to grasp the tool or article more firmly, instead of gradually working loose, as often happens with many forms of chucks.

I am aware that chucks have been made in which tapered or beveled jaws were seated in

slots in a stock adapted to be applied to a lathe-mandrel, and provided with a conical cap to draw the jaws together and springs to throw them apart, and I make no claim to such construction.

The shell may be made with a central opening if arranged to screw upon a lathe-mandrel, in which case the bearings of the inner ends of the jaws must be outside of the limits of said opening.

Having thus described my invention, what I claim is—

1. In a chuck, the combination of an internally-threaded shell adapted to be applied to a lathe-mandrel, an externally-threaded block or head fitting within the shell, and provided with radial slots having faces inclined relatively to the longitudinal axis of the chuck, and jaws inserted within said slots and bearing against the shell at their inner ends, substantially as described and shown.

2. The combination, in a chuck, of an internally-threaded shell adapted to be applied to a lathe-mandrel, an externally-threaded head or block screwing into said shell, and provided with radial slots, and radially-moving jaws seated in said slots, all constructed and arranged substantially as described and shown, whereby the jaws are caused to tighten automatically upon an article placed within their grasp as the resistance to rotation is increased.

3. In combination with internally-threaded shell C, externally-threaded head or body A, having radial slots *b*, and a polygonal front end and jaws, B, seated in the slots *b*, all substantially as described and shown.

4. In combination with head or block A, having opening *a*, slots *b*, and cavities *d*, springs *f*, seated in said cavities, jaws B, seated in the slots *b*, and having lugs *g* extending into cavities *d* and resting upon the springs therein, and shell C, screwed upon the body A and bearing against the inner ends of the jaws B, substantially as and for the purpose set forth.

JAMES S. CHURCH.

Witnesses:
WM. W. ALLIS,
CHARLES ALLIS.