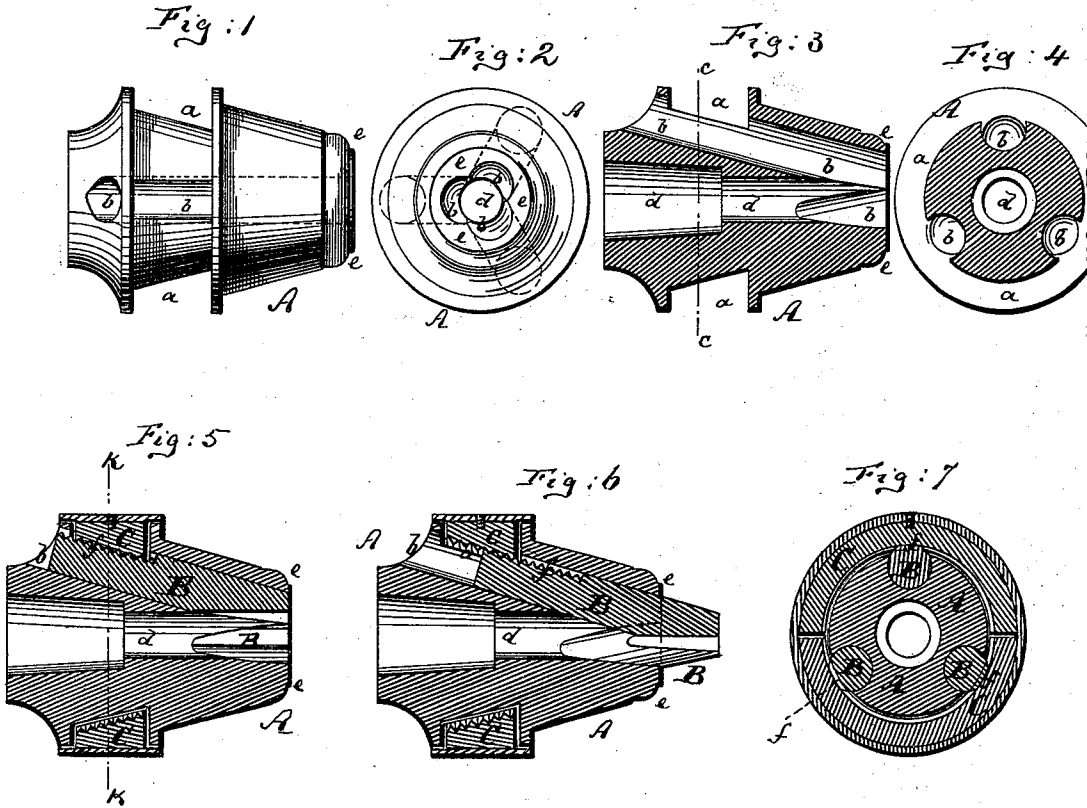


T. R. ALMOND.
DRILL-CHUCK.

No. 173,152.

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Witnesses:

A. Moraga.
O. A. Widner.

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by his attorney
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UNITED STATES PATENT OFFICE.

THOMAS R. ALMOND, OF FITCHBURG, MASSACHUSETTS.

IMPROVEMENT IN DRILL-CHUCKS.

Specification forming part of Letters Patent No. 173,152, dated February 8, 1876; application filed August 18, 1875.

To all whom it may concern:

Be it known that I, THOMAS R. ALMOND, of Fitchburg, county of Worcester and State of Massachusetts, have invented a new and Improved Drill-Chuck, of which the following is a specification:

Figure 1 of the accompanying drawing represents a detail side view of the shell or body of my improved chuck without the jaws and nut. Fig. 2 is an outer end or face view of said shell or body. Fig. 3 is a longitudinal central section of said shell or body; and Fig. 4 is a transverse section thereof on the line *e e*, Fig. 3. Fig. 5 is a longitudinal central section of my improved drill-chuck complete, showing the jaws expanded to their greatest extent. Fig. 6 is a similar section of the same, but with the jaws pushed out and contracted to their fullest extent. Fig. 7 is a transverse section of the same on the line *k k*, Fig. 5.

Similar letters of reference indicate corresponding parts in all the figures.

The object of this invention is to reduce the expense, increase the strength, and simplify the construction of chucks commonly termed "drill-chucks."

The principal feature of the improvement has reference to the construction of the shell or body of the chuck, which constitutes the guide and receptacle for the jaws, and, in combination therewith, to an improved form of jaws.

Heretofore the shells or bodies of chucks which were adapted to receive converging jaws were invariably grooved on their conical faces for the reception of the jaws. The jaws were usually T-shaped in cross-section, and it was a matter of great expense and labor to form the corresponding T-shaped grooves in the shell. The outer small end of the shell was, by the external grooving, cut clear through from the outer to the inner circumference, and greatly weakened thereby.

I have discovered that by drilling or perforating (instead of grooving) the shell I produce perfect guides, which embrace the jaws on all sides and leave the shell much stronger, as its outer end remains solid around the jaws.

The letter *A* in the drawing represents the shell or body of my improved chuck. It is made of truncated conical form, with a recess

or depression, *a*, around its larger part, as shown in Figs. 1 and 3. This shell is bored centrally, and adapted to be placed on a spindle in the usual manner. The guideways *b b*, for the converging jaws of the chuck, I produce in the shell by drilling—that is to say, I bore from the base through the shell toward the smaller outer end, or vice versa, in such manner that each channel or guideway thus produced will be oblique to the axis of the shell, as in Fig. 3, and strike the central bore *d* thereof at the outer end, as shown; whereas at the larger end of the shell each guideway will reach through the circumference of the shell, as also shown in Fig. 3. That portion of the shell which has the recess *a* is merely grooved by the boring of the guideways, as indicated in Fig. 4.

The channels *b* may be drilled before or after the recess *a* is formed on the shell.

Now, it will be perceived that by thus drilling or perforating the shell to form cylindrical, oval, or prismatic guideways through the shell, instead of grooving the same externally, I leave the small outer end of the shell solid around the guideways, as indicated by the ring *e* in Fig. 2, which is a most important improvement; and at the same time, by the process of boring, I am enabled to produce a less expensive shell than by grooving the ordinary T-shaped guideways, and my guideways will embrace the jaws completely, and hold them firmly in position. I prefer, of course, cylindrical guideways, as they are cheaper to produce than others, and as they admit cylindrical jaws *B B*, which may be cut from wire of the proper thickness. These jaws *B B* are inserted in the bored guideways *b b*, to extend from the base of the shell outward as far as the central bore *d* of the shell, as in Fig. 5. The outer part of each jaw is, where it faces the central bore *d*, cut away to be parallel with the axis of the bore *d*, and to be V-shaped in cross-section, as usually. The external part of each jaw is threaded or toothed, as shown at *f f* in the drawing, to fit the thread of a conical nut, *C*, which is placed around the recessed part *a* of the shell, and confined in place by suitable means.

By turning the nut *C* the jaws will be drawn inward and expanded, as in Fig. 5, or pushed

outward and contracted, as in Fig. 6, in the manner desired.

When cylindrical jaws are used, as in the drawing, they are prevented from turning in their cylindrical guideways by their thread or teeth, which mesh into the thread of the nut C—that is to say, I cut the thread or teeth *f* on each jaw on the arc of a circle of about the diameter of the smaller thread of the nut C, as indicated in Fig. 7, and give thereby to the nut a firm hold on each thread of each jaw, and, at the same time, I flatten the jaw to an extent that it will be prevented from turning on its own axis.

It will be observed that on a shell which has the guideways *b b* drilled through, as shown, the recess *a* is a necessary feature to enable the conical nut to reach the threaded parts of the jaws, and to properly locate the nut on the shell.

I claim as my invention—

1. The shell or body of a drill-chuck, pro-

vided with three or more oblique perforations, *b b*, which constitute guideways for the jaws, and which converge and extend to the central bore at the solid annular front end *e* of the shell or body, substantially as described.

2. The chuck-jaw B, made cylindrical, and provided with a series of teeth or threads, *f f*, which are cut on a larger circle than the diameter of the jaw to prevent the latter from turning, substantially as specified.

3. The improved chuck herein described, consisting of the drilled and recessed shell or body A, the jaws B B, and the conical nut C, all combined and arranged substantially as shown.

The above description of my invention signed by me this 16th day of August, 1875.

THOMAS R. ALMOND.

Witnesses:

T. K. WARE,

GEO. W. CANN.