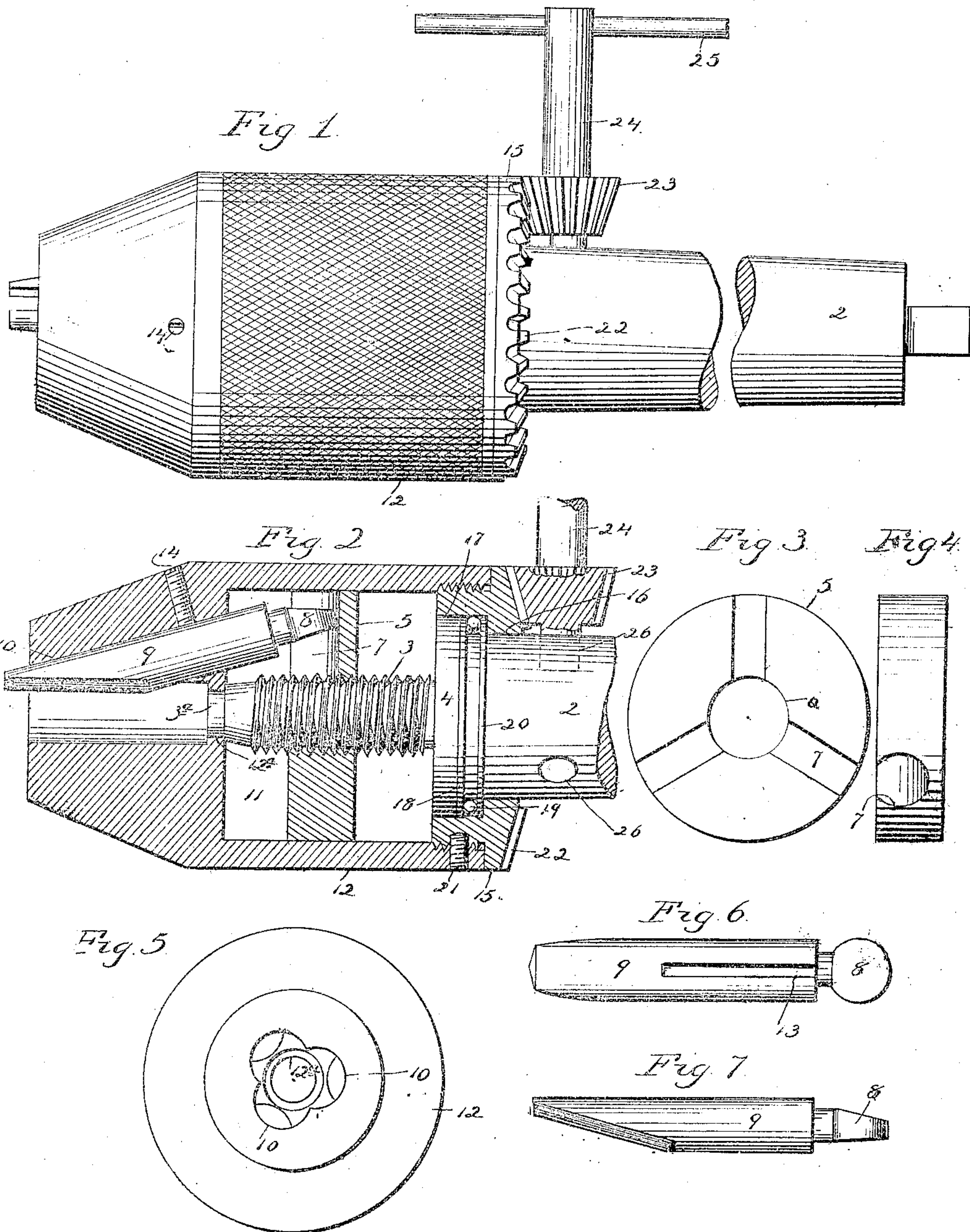


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PATENTED FEB. 18, 1908.

H. L. COIT.  
DRILL CHUCK.

APPLICATION FILED JULY 1, 1907.



Witnesses  
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# UNITED STATES PATENT OFFICE.

HARRY L. COIT, OF NEW LONDON, CONNECTICUT.

## DRILL-CHUCK.

No. 879,741.

Specification of Letters Patent.

Patented Feb. 18, 1908.

Application filed July 1, 1907. Serial No. 381,649.

*To all whom it may concern:*

Be it known that I, HARRY L. COIT, a citizen of the United States, residing at New London, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Drill-Chucks; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a view in elevation which one form of my improved drill chuck may assume. Fig. 2 a view thereof in central longitudinal section. Fig. 3 a reverse plan view of the jaw-carrying disk. Fig. 4 an edge view thereof. Fig. 5 a reverse plan view of the shell. Fig. 6 a view in outside elevation of one of the jaws. Fig. 7 an edge view thereof.

My invention relates to an improvement in drill chucks, the object being to produce a simple, compact, durable, convenient and effective device constructed with particular reference to the tightening of the jaws upon the drill by the resistance of the drill to rotation.

With these ends in view my invention consists in a drill chuck having certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In carrying out my invention as herein shown, I employ a mandrel 2 provided at its lower end with a stem 3 having left hand threads and arranged centrally with respect to the axis of the mandrel from which it is separated by an annular shoulder 4 located at the lower end of the mandrel proper. Upon the said stem 3 is mounted a jaw-carrying disk 5 formed with a central circular opening 6 having left hand threads corresponding to those of the stem on which the disk 5 is raised and lowered by means of the said threads. The said disk is formed in its lower face with three equidistant radial passages or guide-ways 7 substantially circular in cross-sectional form and leading inward from the smooth outer periphery of the disk into the threaded central opening 6 thereof. These radial passages 7 also intersect the lower face of the disk in which, however, they are contracted for their retention of the rounded heads 8 at the upper ends of the jaws 9 which are vir-

tually suspended thereby from the disk in which their upper ends are free to move radially within the limits imposed by the length of the passages 7. The lower ends of these jaws extend downwardly through three equidistant holes 10 leading out of the bottom of the chamber 11 of the chuck shell 12. These holes are inclined toward each other and merge into each other at the bottom of the shell through which the lower ends of the jaws project as shown. To prevent the rotation of the jaws without interfering with their radial movement, each jaw is formed in its outer face with a groove 13 for the reception of a screw 14 in the beveled lower end of the shell. When the shell is rotated from right to left the disk 5 will, so to speak, climb the stem 3 and lift the jaws 9 whereby they will tend at their lower ends to separate from each other and thus open the chuck. On the other hand, when the disk is rotated from left to right, the disk 5 will descend upon the stem 3 and cause the jaws to approach each other and grip the drill. At its extreme lower end the stem 3 is formed with a bearing 3<sup>a</sup> which enters a corresponding step or socket 12<sup>a</sup> in the center of the floor of the chamber 11 in the said shell 12.

At its upper end the shell 12 is formed with internal screw threads for the reception of a threaded annular cap 15 formed with a central opening 16 adapting it to fit over the lower end of the mandrel 2. A concentric recess 17 in the lower face of the cap receives the shoulder 4, a ball-bearing washer 18, a series of balls 19 and a ball-bearing washer 20, the said washers 18 and 20 being located between the bottom of the recess 17 and the upper face of the shoulder 4, and the balls being located between the two washers. A screw 21 in the upper end of the shell enters the cap 16 for holding the same against rotation therein.

In order to start the shell with reference to the mandrel so as to turn it from right to left, and thus cause the disk 5 to climb the stem 3 and open the jaws 9 and release the drill, I by preference provide the upper face of the cap with a concentric series of beveled teeth forming a rack 22 with which I use a beveled pinion 23 mounted upon a stem 24 carrying a handle 25, the inner end of the stem 24 being temporarily inserted into a radial hole or step 26 in the lower end of the mandrel. After a drill has been placed between the jaws 9 the shell is turned by hand from left to



right. This movement will be transmitted by the jaws 9 to the disk 5 which will descend upon the stem 3 and so grip the drill. Now as the chuck is rotated by the mandrel from right to left the resistance offered to turning by the drill will tend to turn the shell from left to right which will cause the disk 5 to descend and all the more firmly grip the drill. To remove the drill the shell must be turned from right to left with respect to the mandrel so as to cause the disk to climb the stem 3. If the shell cannot be started by hand, it may be started by the temporary use of the pinion 23 which will be applied to the mandrel 2 so as to coact with the rack 22 or some other means may be resorted to for forcibly starting the shell to remove the drill.

I do not broadly claim the use of ball-bearings in a drill-chuck, their use having been shown and described in my prior patent granted February 27, 1906, No. 813,864,

but only the particular ball-bearing construction shown and described herein.

I claim:—

In a drill chuck, the combination with a mandrel provided at its lower end with a stem having a left hand thread, of a jaw-carrying disk having a concentric threaded opening adapting it to be mounted upon the said stem, jaws suspended from the said disk, a shell chambered to receive the said disk and jaws, and a cap by means of which the shell is suspended from the mandrel, whereby by turning the shell the said disk is movable back and forth upon the said stem.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

HARRY L. COIT.

Witnesses:

MAX JAGGER,  
CHAS. C. PERKINS.