

1,012,731.

Patented Dec. 26, 1911.

2 SHEETS—SHEET 1.

Fig. 1

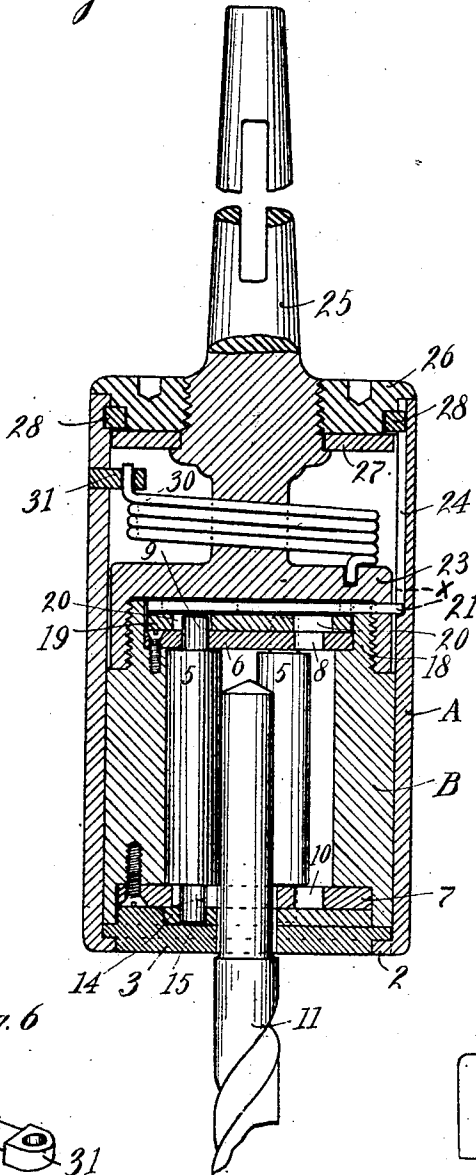


Fig. 2

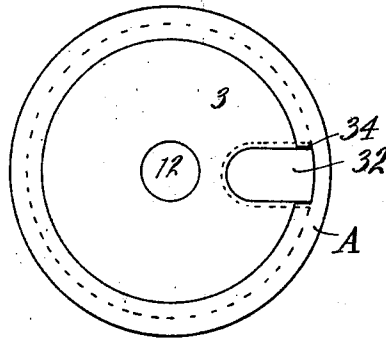


Fig. 3

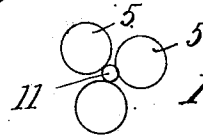


Fig. 4

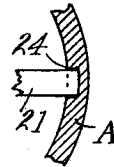


Fig. 5

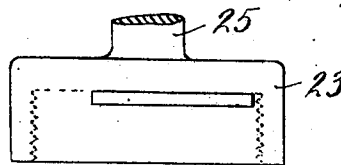


Fig. 6



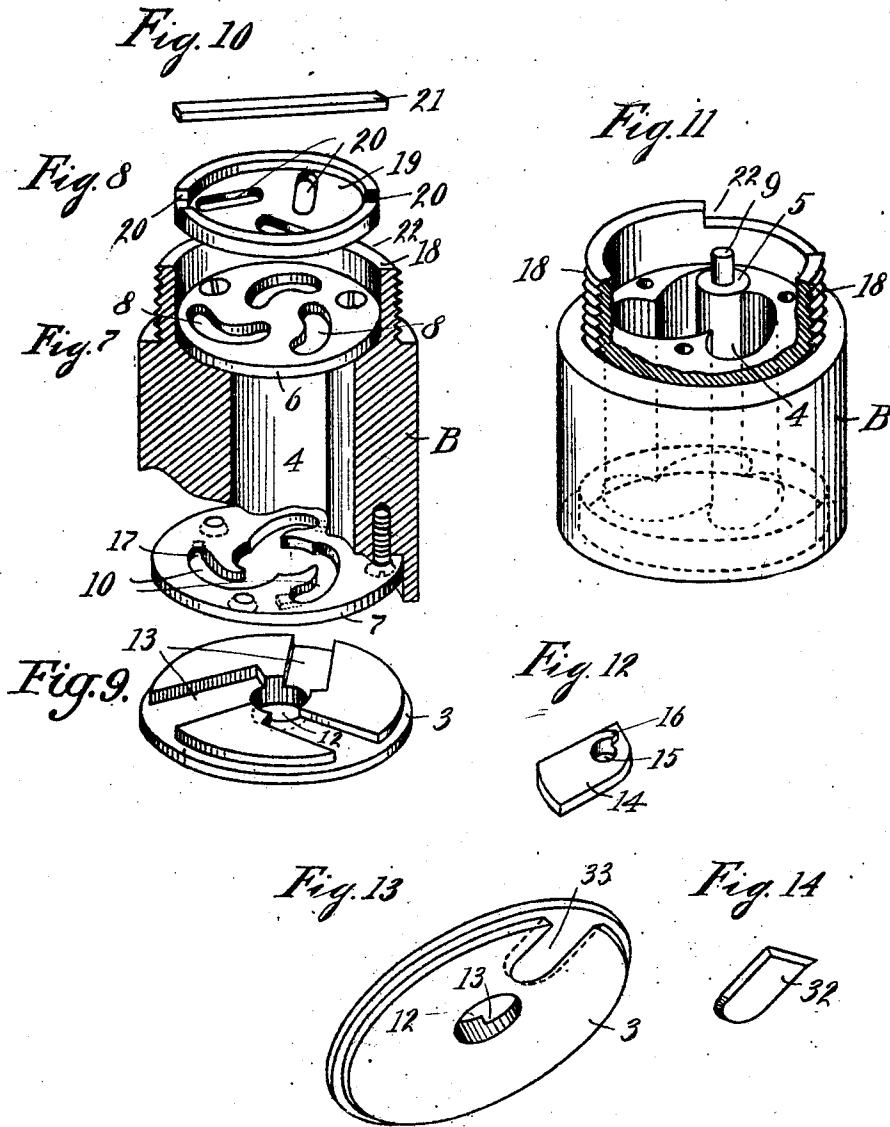
Witnesses,
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Inventor,
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2 SHEETS-SHEET 2.



Witnesses,
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UNITED STATES PATENT OFFICE.

CHARLES SJOSTRAND, OF ST. PAUL, MINNESOTA.

CHUCK.

1,012,731.

Specification of Letters Patent.

Patented Dec. 26, 1911.

Application filed June 30, 1911. Serial No. 636,217.

To all whom it may concern:

Be it known that I, CHARLES SJOSTRAND, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Chucks, of which the following is a specification.

My invention relates to improvements in drill chucks, its object being particularly to provide improved means for securing the drill in the chuck, and consists in the features of construction and combination hereinafter described and claimed.

In the accompanying drawings forming part of this specification Figure 1 is a vertical section through the middle of the chuck; Fig. 2 is a plan view of the plate forming part of the chuck; Fig. 3 is a conventional view illustrating the method of fastening the drill within the chuck; Fig. 4 is a sectional view broken away through the chuck on line *a* of Fig. 1; Fig. 5 is a side elevation, broken away, of the lower end of the shank portion of the chuck; Fig. 6 is a detail view of a spring support forming part of my invention; Fig. 7 is a view partly in perspective and partly in vertical section of a roller housing with the top and bottom removed forming part of my chuck; Figs. 8 and 9 are perspective views of the top and bottom of the housing; Fig. 10 is a perspective view of a locking key forming part of my invention; Fig. 11 is a perspective view of the roller housing partly broken away; Fig. 12 is a perspective view of a guide which works in connection with the bottom plate shown in Fig. 9; Fig. 13 is a perspective view showing the bottom side of the plate illustrated in Fig. 9; and Fig. 14 is a perspective view of a locking key which coöperates with the plate shown in Fig. 13.

As shown in the drawings the chuck comprises a shell A having at the bottom an inverted annular flange 2 upon which rests a plate 3. Upon this plate rests a roller housing B formed with a central trefoil like support 4, the lobes of which are involutely curved so as to permit and cause the rollers 5, one of which is arranged within each of the three lobes, to move inwardly toward the center. The rollers are held within the housing by means of top and bottom plates 6 and 7, respectively, which are screwed to the upper and lower ends of the housing, as shown in Fig. 3.

The top plate is formed with three involutely curved openings 8, through which the upper spindles 9 of the rollers pass, and in which they work. The bottom plate 7 is also formed with three similar and registering openings 10, but the inner ends of these openings merge into a central hole adapted to receive the shank of a drill 11. The lower spindles of the rollers pass through, and work within, these openings 10.

The plate 3 is formed with a central opening 12 to receive the shank of the drill, and with three straight grooves 13 set a little off the radial lines. Within each groove is a sliding guide plate 14, having a hole or socket 15 to receive the lower spindle of the roller. The sliding plates 14 work back and forth in the grooves 13, and have at their inner ends bosses 16 which enter notches 17 upon the underside of the plate 7, to limit their movement.

Within the reduced and exteriorly threaded upper end 18 of the housing B is fitted a plate 19 having three slotted openings 20 offset from the center and registering with the grooves 13 in the plate 3. The upper spindles 9 of the rollers project through these holes, and the plate 19 fits down against the top of the housing. In the rim of the plate 19 are two oppositely arranged notches 20 adapted to receive a key 21, which also extends through a long notch 22 in the reduced end 18 of the housing.

When the upper and lower plates 6 and 7 of the housing have been screwed into place over the rollers, the housing is placed upon the plate 3 within the shell A. Upon the threaded upper end of the housing is then screwed a cap 23, having a horizontal slot through which the key 21 projects and works. As will be seen from Fig. 1 the shell A is formed with a vertical key way 24, which permits the key to be inserted into the shell, but which will cause the key to be turned with the shell, when the latter is turned. The cap 23 is made integral with an upwardly extending shank 25 which is intended to be made fast in the drill machine. At the upper end of the shell is a head 26 which is screwed down fast upon a washer 27 in which the shank 25 turns, the shell and head being held in rotatable engagement by means of a split ring 28. The rollers are held in normal position within the housing by means of a spring 30 secured

at one end to the shell A by means of the spring supporting device 31 and at the other end to the cap 23 of the housing.

It will be seen that the shell A is normally held by the spring 30 in position where the rollers will stand clustered together at the center at the inner ends of the trefoil lobes. When the drill is to be inserted into the chuck the shell A is turned by hand against the tension of the spring 30. As the shell turns it will carry with it the key 21, which will turn the plate 19 through which the upper spindles 9 of the rollers pass. When this plate is turned it will force the rollers away from each other to the outward limit of their travel in the involutely curved openings 8 and lobes 4. The shank of the drill is then inserted into the hole 12 in the plates 3 and the registering opening 10 in the bottom plate 7 of the housing. The shell A is then released and is carried back by the spring 30 into its normal position. As it is thrown back it will carry with it the key 21 and the plate 19, thereby causing the rollers to move inwardly together against the drill chuck so as to hold it firmly. The plates 14 which work in the grooves 13 will move freely with the rollers, and guide the travel of their lower spindles, so as to hold the rollers always in parallelism. Thus by this apparatus, when a drill is to be inserted it is only necessary to turn the housing against the spring, insert the drill, and release the housing. This will bring the rollers together into gripping position. The bottom plate 3 is held against turning by means of a key 32 which fits in a slot 33 in the underside of the plate 3 and projects into a notch 34 in the inwardly extending flange 2 of the chuck.

I claim as my invention:

1. In a chuck of the class described, the combination of a shank, a shell rotatable thereon, a spring connecting said shank and shell, a housing within said shell, a plurality of rollers journaled in said housing, a plate formed with inwardly directed slots receiving the adjacent ends of said rollers, means actuated by said shell for rotating said plate to draw the adjacent ends of the rollers inwardly for the purpose set forth.

2. In a drill chuck of the class described,

the combination with a shank, a shell rotatable thereon, a spring connection between said shank and shell, a housing within said shell, a plate rotatably mounted upon the end of said housing and formed with inwardly curved slotted openings, a plate secured at the opposite end of said housing and carrying inwardly slidable guides, a plurality of rollers supported at their opposite ends in said slots and guides respectively, means actuated by said shell as it is rotated to force said rollers inwardly for the purpose set forth.

3. In a drill chuck of the class described, the combination with a shank, a shell rotatable thereon, a spring connection between said shank and shell, a housing within said shell, a plate rotatably mounted upon the end of said housing and formed with inwardly curved slotted openings, a plate secured at the opposite end of said housing and carrying inwardly slidable guides, a plurality of rollers supported at opposite ends in said slots and guides respectively, and means comprising a rotatable plate having inwardly directed straight slots receiving the adjacent ends of said rollers, said plate being operatively connected with the shell to force said rollers inwardly as the same is rotated upon the shank.

4. In a drill chuck of the class described, the combination with a shell rotatable thereon, a spring connection between said shank and shell, a housing within said shell, a plate rotatably mounted upon the end of said housing and formed with inwardly curved slotted openings, a plate secured at the opposite end of said housing and carrying inwardly slidable guides, a plurality of rollers supported at opposite ends in said slots and guides respectively, and means for forcing said rollers inwardly comprising a plate formed with inwardly extending straight slots for receiving the adjacent ends of said rollers and a key locking together said plate and shell.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES SJOSTRAND.

Witnesses:

WIFFORD OLSON,
OLOF. OLSON.