No. 685,677. Patented Oct. 29, 1901.

Z. T. FURBISH.

BALL CHUCK.

(Application filed Feb. 27, 1901.)

(No Model.)

Fig. 1.

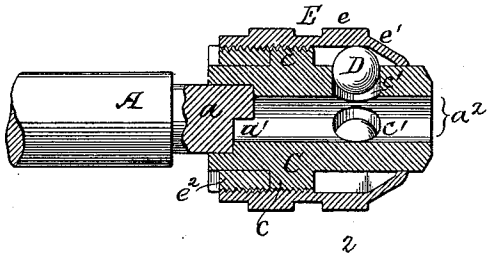


Fig. 2.

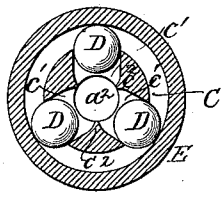


Fig. 3.

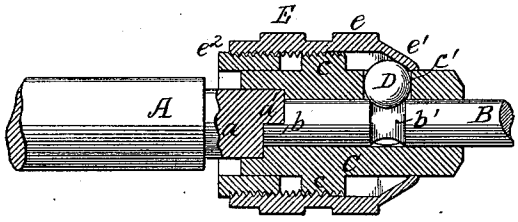


Fig. 4.

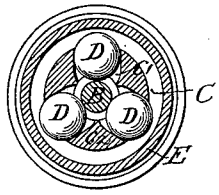
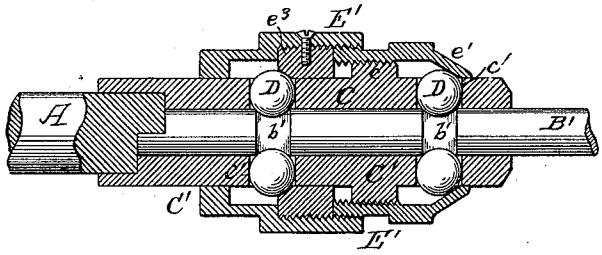


Fig. 5.



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UNITED STATES PATENT OFFICE.

ZACHRY T. FURBISH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO NORTH BROTHERS MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

BALL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 685,677, dated October 29, 1901.

Application filed February 27, 1901. Serial No. 49,113. (No model.)

To all whom it may concern:

Be it known that I, ZACHRY T. FURBISH, a citizen of the United States, residing at Philadelphia, Pennsylvania, have invented certain Improvements in Ball-Chucks, of which the following is a specification.

The object of my invention is to construct a chuck in which a number of balls can be used to hold the drill or bit from being drawn out of the chuck.

My invention is especially adapted to be used in chucks which fit a given-sized bit or drill, the bit or drill being simply held in position by the balls and held from turning independently of the chuck by separate means.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my improved chuck open to receive a bit or drill. Fig. 2 is a sectional view on the line 2 2, Fig. 1. Fig. 3 is a sectional view similar to Fig. 1, showing the balls engaging a bit or drill. Fig. 4 is a transverse section of Fig. 3 on the same line as Fig. 2, and Fig. 5 is a view of a modification of my invention.

A is the stock of the chuck, which may form part of the spindle of a hand-drill or may be shaped to form a lathe or drill head. This stock has a reduced portion a, which is shaped to form a shoulder a', with which a projection b on the end of the bit or drill engages, as shown in Fig. 3, so that when the bit is in position, as in Fig. 3, the bit or drill must turn with the chuck.

C is the body of the chuck, secured to the reduced portion a of the stock A in any suitable manner, and on this body portion is a flange c, having a screw-thread on its periphery. Near the forward end of the body are in the present instance three passages c', radiating from a common center. These passages are reduced at their inner ends, forming shoulders c^2. Mounted in the passages are balls D. These balls fit the passages snugly; but the shoulders c^2 prevent the balls from passing into the cavity a^2 for the bit.

E is a shell consisting of a sleeve e, having an internal thread engaging the threaded flange c of the body C, and this sleeve has a tapered outer end e', which engages the balls D and forces them, when the shell is retracted, toward the central opening a^2. Screwed into the rear of the sleeve e is a ring e^2, which forms the other part of the shell and limits the outward movement of the shell by coming in contact with the rear edge of the flange c. A cavity is formed between the tapered end c' of the sleeve e and the front edge of the flange c, into which the balls may pass when it is desired to detach the drill or bit from the chuck. The bit or drill B, as shown in Figs. 3 and 4, has an annular groove b', into which the balls extend when the bit is in position, as shown in Fig. 3, and in order to hold the balls in this position and lock the bit or drill to the chuck the shell E is so turned as to draw it back until the portion e' bears against the balls, holding them in the groove of the spindle B.

While I have shown the bit having an annular groove with a curved bottom to fit the balls, it will be understood that the groove may be of any shape desired and independent cavities may be formed in the bit without departing from my invention, which relates to the particular construction of the chuck.

In Fig. 5 I have shown a modification of my invention which can be used, if necessary, in large-sized chucks. In this instance I have shown two sets of balls and the body C′, enlarged to accommodate them, and the shell E′ is made in three pieces, so secured together that the parts will work in unison and arranged so that the two beveled faces e' and e^3 will force their respective balls into the grooves of the bit B′ in unison. In this instance there are cavities in the shell for the reception of the balls when moved into position to release the bit.

I claim as my invention—

1. The combination of a chuck, means for preventing a bit or drill from turning in the chuck, a series of radiating passages in the body of the chuck, balls in the passages, and a tapered shell constructed to force the balls toward the center of the chuck when said shell is moved longitudinally, substantially as described.

2. The combination in a chuck, of a body, means for preventing a bit or drill from turning in the body when in position, three radi-

ating passages in the body, a ball in each passage, a shell, and means for causing the shell to move longitudinally on the body when turned, the said shell having a tapered portion engaging with the balls to force them against the chuck, substantially as described.

3. The combination in a chuck, of a body, an external flange, said flange having a thread on its periphery, means for preventing the bit or drill from turning in the chuck when in position, three radiating passages in the body, a ball in each passage, a shell made in two parts, one part being threaded and engaging the threaded flange of the body, and an externally-threaded ring screwed into the end of the threaded portion of the shell back of the flange of the body, the outer end of the shell being tapered and arranged to act upon the balls and force them toward the center of the chuck, substantially as described.

4. The combination in a chuck, of a stock recessed at the end to form a shoulder with which the bit or drill engages so that the bit or drill must turn with the chuck, a body secured to the stock and having an opening or passage for the reception of the bit or drill, three radiating passages in the forward end of the body, said passages being reduced at their inner ends to form shoulders, a ball in each passage, the inward movement of the balls being limited by the shoulders, a screw-threaded flange on the body, a shell having an internal screw-thread engaging the threads of the flange and having a tapered end engaging the balls, substantially as described.

5. The combination in a chuck, of a body having two sets of radial channels, one back of the other, a ball in each channel of each set, means for preventing a bit or drill from turning in the body, a shell, means for moving the shell longitudinally on the body as it is turned, and means on the shell for acting upon the balls to force them toward the center of the chuck, substantially as described.

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

ZACHRY T. FURBISH.

Witnesses:
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