No. 728,276. PATENTED MAY 19, 1903.

K. O. MUEHLBERG.

DRILL CHUCK.

APPLICATION FILED MAY 3, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1

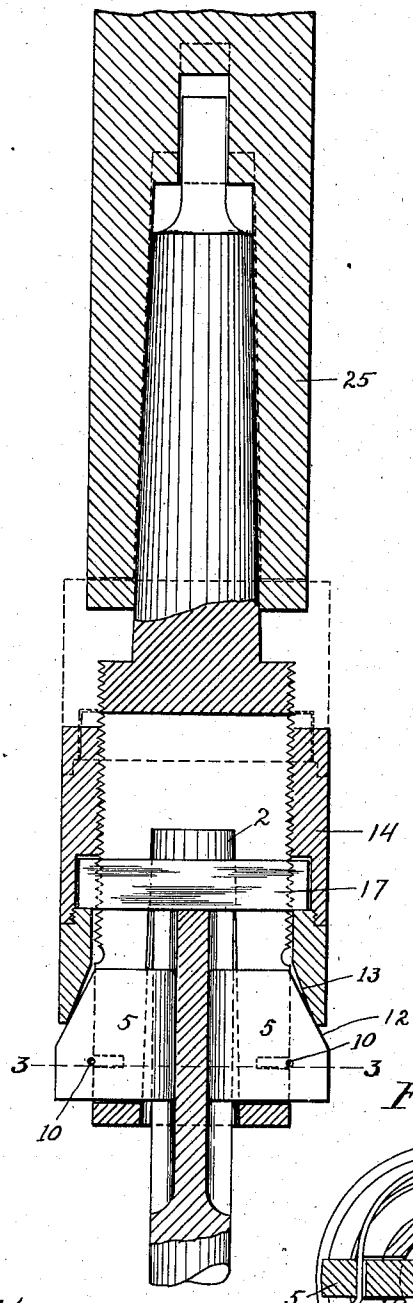


Fig. 2

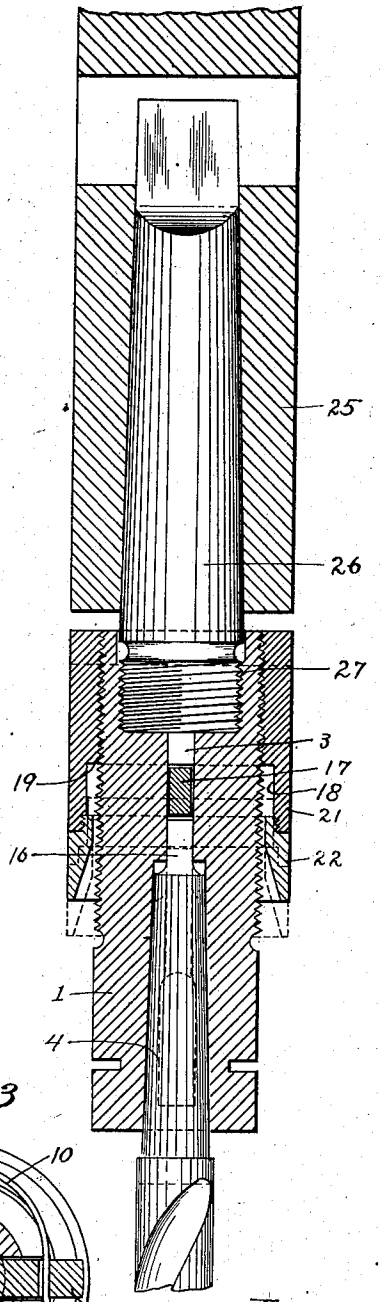
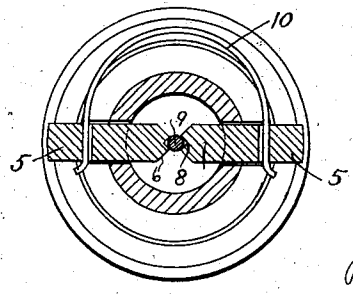


Fig. 3



Witnesses.
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4

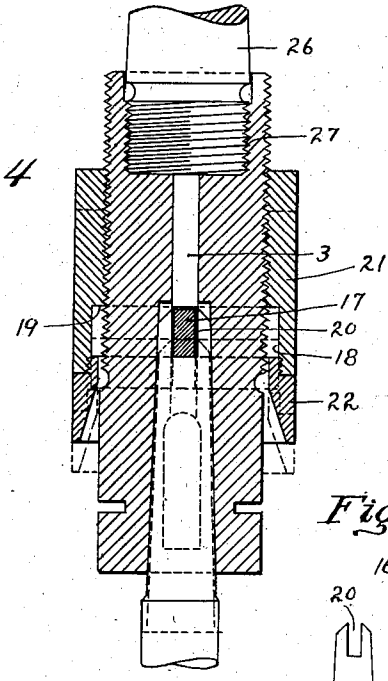


Fig. 5

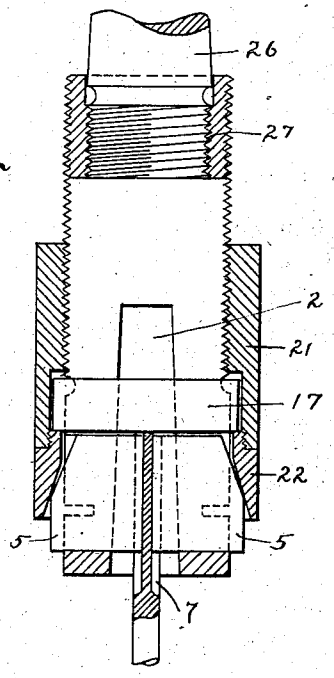


Fig. 7

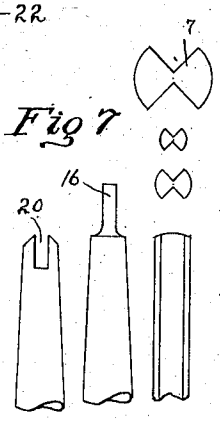


Fig. 6

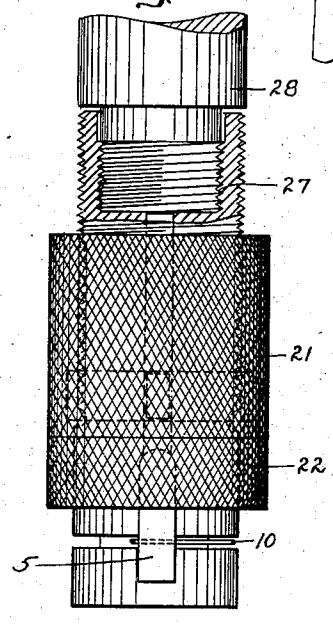
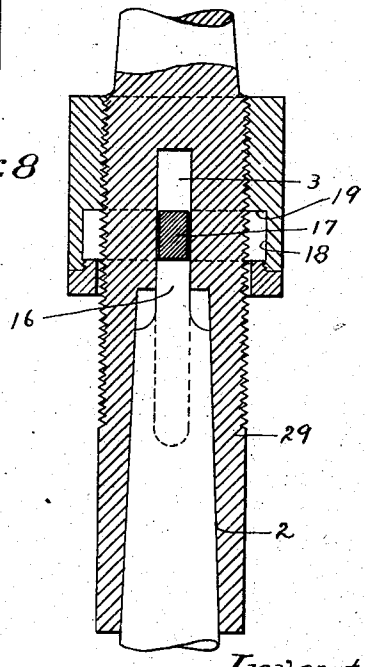


Fig. 8



Witnesses.

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No. 728,276. Patented May 19, 1903.

UNITED STATES PATENT OFFICE.

KARL O. MUEHLBERG, OF BRADDOCK, PENNSYLVANIA.

DRILL-CHUCK.

SPECIFICATION forming part of Letters Patent No. 728,276, dated May 19, 1903.

Application filed May 3, 1902. Serial No. 105,754. (No model.)

To all whom it may concern:

Be it known that I, KARL O. MUEHLBERG, a resident of Braddock, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Drill-Chucks; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to drill-chucks; and its object is to provide a chuck which will hold various sizes of V-grooved drill-bits or a Morse tapered drill-bit or the latter with its tongue broken off and will also hold a small drill-bit having a round shank.

A further object of my invention is to provide a drill-chuck whereby the bit can be forced out of the chuck should it stick and whereby the chuck can be forced out of the spindle of the drill-press should it become wedged therein.

A further object of my invention is to provide a drill-chuck which is capable of being used either on a power drill-press or attached to the ordinary hand-press.

In the accompanying drawings, Figure 1 is a vertical section through one form of my chuck, showing the same holding a bit having V-grooves in its shank. Fig. 2 is a vertical section at right angles to that shown in Fig. 1, showing the chuck holding an ordinary Morse tapered bit. Fig. 3 is a cross-section on the line 3 3, Fig. 1. Fig. 4 is a vertical section through the chuck, showing it holding a broken Morse tapered bit. Fig. 5 is a view similar to Fig. 1, showing a very small V-groove bit held in the chuck. Fig. 6 is a side view of the chuck, showing it applied to an ordinary hand-press. Fig. 7 shows different kinds of and the range of sizes of V-groove bits that can be held by a single chuck, and Fig. 8 is a vertical section showing some of the features of the invention applied to an ordinary drill-socket.

My improved chuck comprises a body 1, which is provided with the axial bit-receiving opening 2, which is circular in cross-section for most of its length and preferably tapers slightly, as shown. This opening communicates at its upper end with a slot 3, extending transversely through the body. Also extending through the walls of the body near its lower end are openings 4, in which are mounted the gripping-jaws 5, two such jaws being shown diametrically opposite each other. The transverse slot 3 is shown as communicating with the slots 4, although this is not absolutely essential, and the slots 4 are shown somewhat wider than the slot 3; but this also is not important. The jaws 5 have their inner faces substantially wedge-shaped, as shown at 6, so as to fit into the grooves of a V-groove bit 7, as shown in Figs. 1 and 5. The apex of the wedge-face of the jaws is slightly grooved out, as shown at 8, in order to hold a small bit having a round shank 9, as shown in Fig. 3. These gripping-jaws normally are held outward by means of a suitable spring, such as the bow-spring 10, having its ends extending through openings in the jaws and lying in an annular groove 11, cut in the outside of the chuck-body. The jaws are provided on their outer faces at their upper ends with the tapered or inclined faces 12, which are adapted to be engaged by the conical inner face 13, formed on a sleeve 14, which is threaded on the outside of the body above the jaws. By screwing this sleeve downward the jaws 12 will be forced inward to grip the bit, as will be readily understood. The jaws 5 are of such size and the faces 12 have such an angle that said jaws can be forced into the bit-receiving opening sufficiently far to hold various sizes of V-groove bits, the range of the sizes that can be held by the chuck illustrated being shown in Fig. 7.

The construction so far described enables a single chuck to hold various sizes of V-groove bits and also a very small round shank-bit. To hold the ordinary Morse taper bit 15, such as shown in Fig. 2 and which bits are provided with a tongue 16 at their upper ends, the jaws 5 perform no function; but such bits are merely inserted in the chuck until the flattened tongue 16 projects into the transverse groove 3, the bit being held from dropping out by frictional contact with the walls of the socket and being prevented from turning by the tongue 16, projecting into the groove 3. Lying in this groove 3 is a transverse bar 17, which is of such length that it extends slightly beyond the outer face of the

body of the chuck. The sleeve 14 is cut away, as shown at 18, to receive the projecting ends of this transverse bar, such cut-away portion ending in the annular shoulder 19, which when said sleeve is screwed downwardly will carry the bar 17 downwardly against the upper end of the bit and force the same out of the chuck in case it should stick therein. This is indicated in dotted lines in Fig. 2. The bar 17, besides serving to force the bit out of the chuck, can also be made to hold a broken Morse taper bit from rotating. The Morse tapered bits are liable to have the tongue 16 broken off, and the usual practice is to reforge the shank of the bit to form a new tongue thereon. With my chuck, however, this is unnecessary, as the broken bit need only have a slot cut across its upper end, as shown at 20, Figs. 4 and 7, which slot will receive the transverse bar 17, as shown in Fig. 4, by which the bit is held from rotation. The bar 17 will also serve to force this modified bit out of the chuck in case it should stick.

To enable the bar 17 to be put in place in the sleeve 14, the latter is formed in two parts—an upper part 21 and a lower part 22—which are connected by any suitable means—as, for instance, being screwed together.

The sleeve 14 is of such length that when screwed upwardly it will contact with the lower end of the spindle 25 of the drill-press, so that in case the chuck should stick in the press it can be forced out of the same by screwing this sleeve up against the lower end of the spindle. My chuck preferably is made so that it can be used either with a power-driven press or with an ordinary hand-drill press. The shank 26 of the chuck is therefore made separate from the body, as shown in Figs. 2, 4, and 5, the connection between the parts being formed by providing the upper end of the body with a screw-threaded socket 27, in which the shank 26 is secured. With the ordinary power-driven drill-press the shank 26 will be inserted in the socket of the spindle, but with the usual hand-press the shank 26 will be removed and the body of the chuck screwed directly onto the end of the hand-pressed spindle 28, as shown in Fig. 6.

The sleeve 14 and the transverse bar 17 may be used not only with a chuck having gripping-jaws, as shown, but on an ordinary socket having no gripping-jaws, as indicated in Fig. 8. This socket 29 is provided with the bit-receiving opening 2 and transverse slot 3, in which the bar 17 moves. The sleeve 14 is threaded on the outside of the body and will serve in this modification to force a drill-bit out of the socket or to hold a drill-bit, such as shown in Fig. 4, against rotation or by screwing the same upward to force the socket out of the spindle of the drill-press.

The operation of the invention will be readily gathered from the foregoing description. It will be seen that I have provided a single chuck whereby several sizes of bits having V-grooves may be held, and which will also hold the ordinary Morse tapered bit or a modified or broken Morse tapered bit, and will even hold a small bit having a round shank. This chuck is also provided with means whereby the bit can be forced out of the chuck and whereby the chuck can be forced out of the spindle of the drill-press and which can be used either on a power-driven press or on an ordinary hand-press. I have shown all these features embodied in a single chuck; but I wish it understood that they may be used separately, if desired. While I have shown and described the chuck for holding drill-bits, it will be understood that it is equally as well adapted for holding taps or similar tools.

What I claim is—

1. A drill-chuck having a body provided with an axial bit-receiving opening circular at its lower portion and non-circular thereabove, and also provided above its lower end with slots communicating with said bit-receiving socket, clamping-jaws in said slots and projecting into the bit-receiving socket, and means for forcing said clamping-jaws inward.

2. A drill-chuck having a body provided with an axial bit-receiving socket circular at its lower portion and non-circular thereabove, and having slots communicating with said bit-receiving socket, jaws in said slots having wedge-shape inner faces at their upper ends and provided with beveled outer faces, and a sleeve threaded on the body and having a conical inner face at its lower end arranged to slide upon the beveled faces of the jaws to force the same inward.

3. A drill-chuck having a body provided with an axial bit-receiving socket, radial slots communicating with said socket, clamping-jaws mounted in said slots and having tapered outer faces at their upper ends, and a sleeve threaded on the body above the clamping-jaws and having a conical inner face at its lower end arranged to slide upon the tapered faces on the clamping-jaws.

4. A drill-chuck having a body provided with an axial bit-receiving opening and having a slot extending transversely of the body communicating with said socket and extending above the upper end thereof, clamping-jaws mounted in the lower end of said slot, a transverse bar mounted in the upper end thereof, and a sleeve threaded on said body to which said cross-bar is attached and adapted to force the jaws inward.

5. A drill-chuck having a body provided with an axial bit-receiving socket and having a slot extending transversely therethrough and communicating with said socket and extending above the upper end thereof, jaws mounted in the lower end of said slot and having beveled outer faces, a sleeve threaded on said body and provided with a conical inner face adapted to engage the beveled faces of the jaws, said sleeve being provided with

an annular groove on its inner face, and a cross-bar mounted in the upper end of the transverse slot in the body and having its end held in the annular groove in the sleeve.

6. A drill-chuck having a body provided with an axial bit-receiving socket and having a transverse slot therethrough and communicating with the upper end of said socket, a cross-bar in said transverse slot, a sleeve threaded on the body and provided with an internal annular groove for engaging the ends of said cross-bar whereby the same may be forced downward.

7. A drill-chuck having a shank adapted to be inserted in the spindle of a drill-press and a body threaded externally, and a sleeve threaded on said body, said sleeve being of sufficient length to project above the body when screwed upwardly and contact with the drill-press spindle, whereby the forcing of said sleeve against the end of the drill-press spindle will force the socket out of the spindle.

In testimony whereof I, the said KARL O. MUEHLBERG, have hereunto set my hand.

KARL O. MUEHLBERG.

Witnesses:
F. W. WINTER,
ROBERT C. TOTTEN.