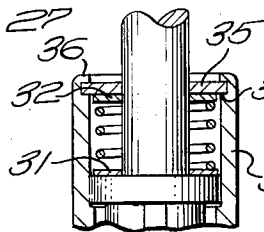
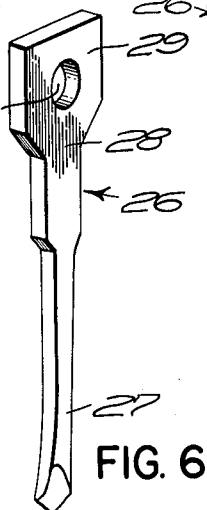
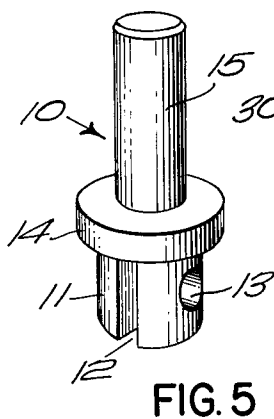
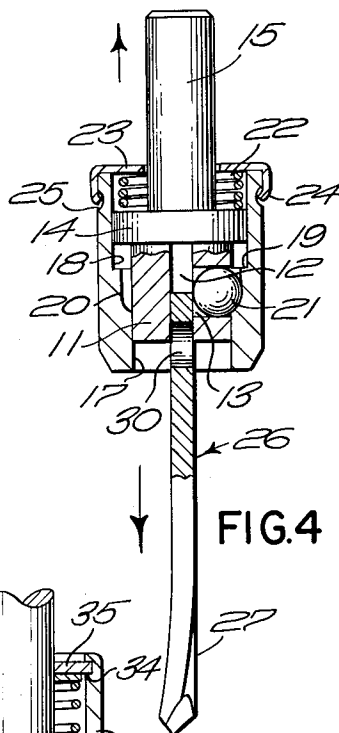
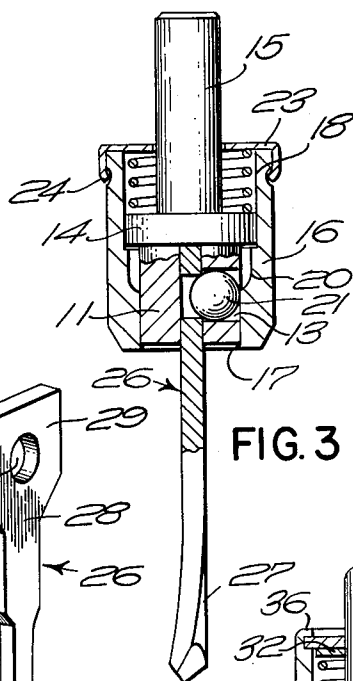
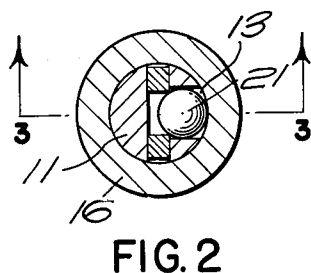
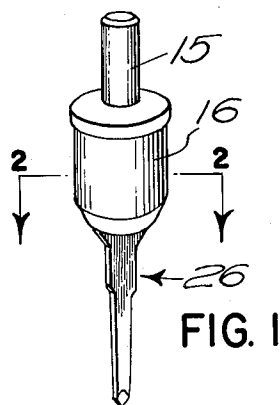


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H. D. BLACKBURN
INTERCHANGEABLE DRILL
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INTERCHANGEABLE DRILL

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3 Claims. (Cl. 279—76)

This invention relates to a drill.

Heretofore it has been customary to purchase a number of different size drills, each of which would be held in some sort of a chuck for rotating the same. The drills frequently break when subjected to hard usage and are replaced.

One of the objects of this invention is to provide the drill in two parts, one of which will be that part which goes into the chuck for rotating the drill and the other will be the shank where breakage usually occurs, and to then assemble these parts so that when breakage occurs but a small inexpensive part of the structure need be discarded for replacement by a fresh one.

Another object of the invention is to make the assembly of the drill shank and the holder portion which is received in the chuck such that pressure only need be applied for assembling the parts, while the parts may be easily disassembled by pulling upon them to move them to released position and then withdrawing one of the parts from the other when moved to this releasing position.

Another object of the invention is to provide a secure holding between the parts when in assembled position.

Another object of the invention is to provide an interchangeable blade for a drill.

Another object of the invention is to provide a construction which may be held outside to prevent marring of wood when the drill goes into the wood so that no objectionable ring need be had.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings:

Figure 1 is a perspective view of the interchangeable blade in its holder;

Figure 2 is a section on line 2—2 of Figure 1;

Figure 3 is a section on line 3—3 of Figure 2 with the parts in locked position;

Figure 4 is a view similar to Figure 3 but showing the parts in released position;

Figure 5 is a perspective view of the body of the holder; and

Figure 6 is a perspective view of the drill blade;

Figure 7 is a sectional view similar to Figures 3 and 4 but showing a modified form of holder.

In proceeding with this invention, I make a holder in the form of a small chuck into which a blade may be easily inserted and held by resilient means. A number of different size blades may be provided for each holder somewhat in the neighborhood of twelve different sizes for one holder.

With reference to the drawings, 10 designates the body of the holder consisting of a cylindrical portion 11 which is slotted as at 12 to divide it into two sections. One section of the member 11 is provided with a hole 13. A flange 14 extends outwardly from the portion 11, while a stem 15 extends axially of the body for insertion in a chuck of the usual type for rotating the drill. A sleeve

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16 has a bore 17 of a size to slidably fit the portion 11 of the body, while it has a larger bore 18 to slidably fit the flange 14 of the body. A shoulder 19 is formed between these bores which will engage the under side of the flange and limit the movement of the sleeve with reference to the body. A tapered or cam portion 20 extends between the shoulder 19 and the bore 17 so as to force the plunger or ball 21 inwardly of the hole 13 as the sleeve is moved from the position shown in Figure 4 to the position shown in Figure 3. A spring 22 encircles the stem 15 and abuts the flange 14 and also presses against a cap 23 which is secured to the sleeve by reason of its edges 24 being rolled inwardly into a recess 25 in the outer surface of the sleeve. This spring slides the sleeve upwardly as shown in Figures 3 and 4 but permits the sleeve to be moved downwardly by manual pressure, as may be desired.

The drill blade is designated 26 and comprises a cutting portion 27 and a shank 28 which has a holding portion 29 generally rectangular in cross section and provided with an opening 30. This holding portion 29 is of a size to be slidably received in the recess or slot 12 of the body and may be inserted therein as shown in Figure 4 by holding the sleeve in one hand and forcing the blade 26 inwardly in the other hand. This will serve to engage the ball and force the body and its stem 15 so as to compress the spring 22 and move the ball into the cam portion 20 of the sleeve, thus allowing the holding portion 29 of the blade to be moved into the slot and against the end thereof, which is substantially in the plane of the juncture of the flange and the portion 11, as shown in Figure 3, in which position the ball may enter the hole 30 and the spring will then move the body relative to the sleeve so as to slide the bore 17 of the sleeve along the ball, holding it into the hole 30 and locking the blade in position.

In order to release the blade, the sleeve will be pulled downwardly into the position shown in Figure 4, and then the blade may be withdrawn as the ball will be forced into the larger tapered portion and out of the opening 30 so that the blade may be slid out of its holder and a blade of different size inserted.

The sleeve 16 projects beyond and is freely rotatable about the body 11, which has a decided advantage in use of the drill in that the sleeve may be grasped by the hand as the drill is moved to a position further inserted and which will abut the stock of the member in which the hole is drilled and by reason of being so grasped will prevent the sleeve from turning. Therefore, no objectionable ring marks are made around the hole which is being drilled, which marks frequently occur in drills where the entire device rotates.

In some cases as shown in Figure 7, a softer support may be provided for the ends of the spring to provide a better bearing for the ends of the spring, and in Figure 7 I have shown at 31 and 32 discs which will be made of a softer material, such for instance as brass, than the spring in order to provide a better bearing surface and seat for the spring. In this figure I have also shown the sleeve 33 as having a shoulder 34 and receiving on shoulder 34 a cap 35 which extends into instead of over the upper edge of the sleeve and has the upper ends of the sleeve 36 bent over this cap.

I claim:

1. A drill comprising a holder and a separable cutting shank, said shank having an out of round base with an opening therein and a free end, and said holder having a body with an out of round recess axially receiving said base, with a hole through the wall of said recess, a ball in said hole, a sleeve slidable along the outer surface of said body away from the outer free end of the shank with a cam surface to force the ball through said hole and into the opening of said base to lock the holder and shank

against axial movement whereby pressure of the work on the sleeve will not move the sleeve to release position.

2. A drill as in claim 1 wherein resilient means acting between said body and sleeve and urging said body and sleeve to locking position.

3. A drill comprising a holder having a relatively axially movable body and sleeve, a spring acting between said body and sleeve for causing relative axial movement of said body and sleeve in one direction, said body having an axially extending opening, a cutting blade in the opening 10 in said body, said blade having a base with a recess therein and axially insertable in said opening in the same direction as the movement of the sleeve on the body by said spring, releasable means including said sleeve and an element freely movable in said recess for locking said blade 15 in position upon movement of the sleeve in the direction urged by said spring, said sleeve projecting beyond said

body and being relatively rotatable about said body so that the same may be grasped and held against rotation as the drill is moved to its final lowered position to prevent circular marking on the work about the hole made by the drill.

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