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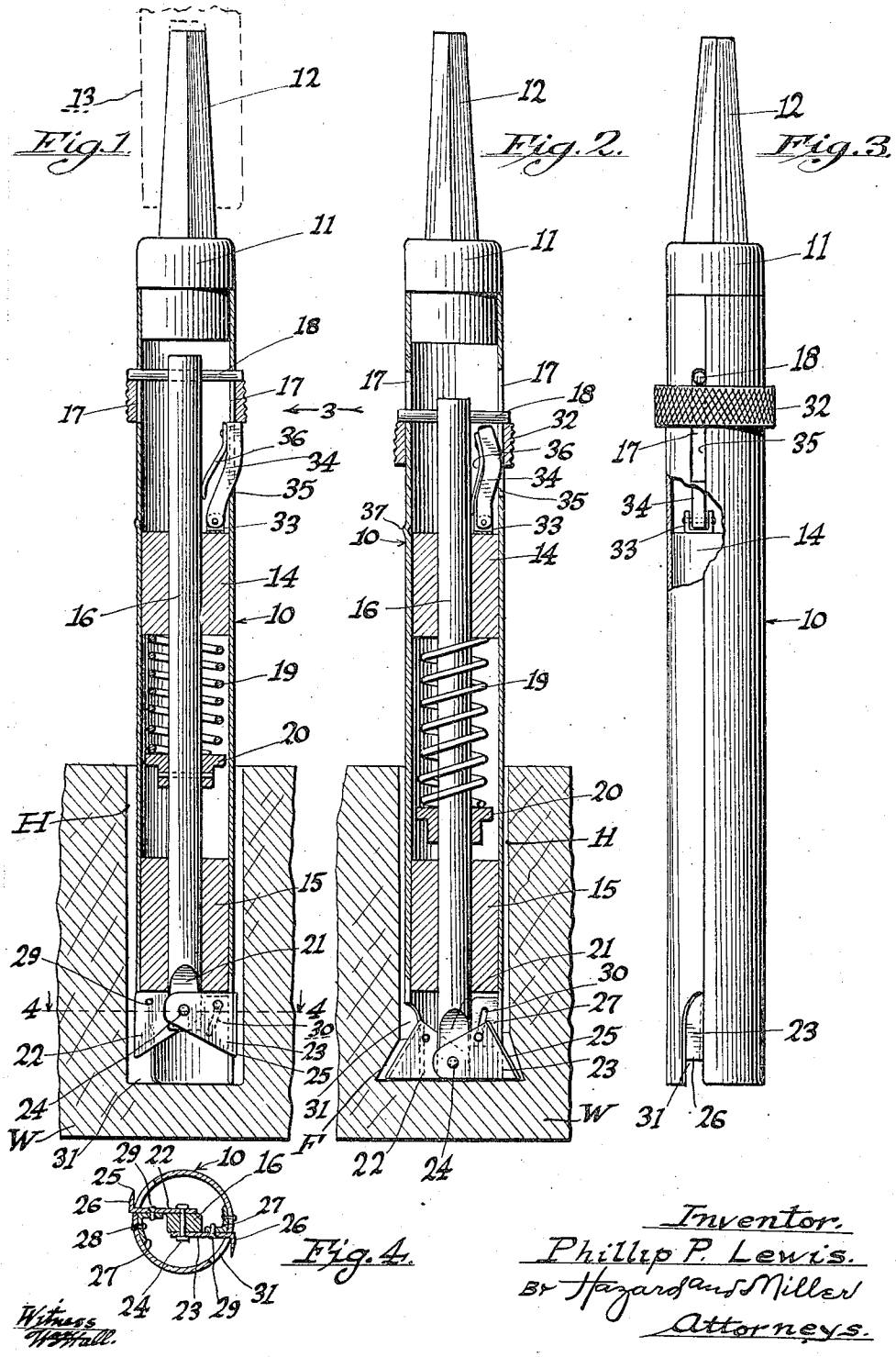


Fig. 1

Fig. 2.

Fig. 3.

Fig. 4.

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TOOL FOR FLARING HOLES.

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This invention relates to improvements in tools adapted to flare the bottoms of drill holes, and is especially adapted to be used in connection with wood work.

It is an object of the invention to provide a tool which may be used either with a brace member of a brace and bit, or may be employed upon a drill press for flaring the bottom of a drill hole so that a dowel pin or similar construction may be inserted into the drill hole with a wedge placed in its bottom, which, when the dowel pin is driven home, will spread the end of the pin and lock it within the flared portion of the drill hole, so that it cannot be withdrawn therefrom, even though the glue may become moistened or heated, and in this manner provide a tight joint.

It is a further object of the invention to provide a tool having a body from which are adapted to be projected cutters, which flare the sides of the hole, and to provide means for forcing the cutters outwardly from the body when within the hole and to provide means for withdrawing the cutters back into the body without stopping rotation of the tool.

It is a still further object of the invention to provide a tool of cheap, simple and durable construction, which will efficiently accomplish the purpose for which it is designed, namely, to flare only the bottom portion of a hole.

With the foregoing and other objects in view which will be made manifest in the following detailed description and pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a vertical section through the improved tool shown as inserted into a hole, which is to have its bottom portion flared;

Fig. 2 is a vertical section, similar to Fig. 1, showing the tool in a hole after having flared the bottom of the hole;

Fig. 3 is a side elevation of the tool taken in the direction of the arrow 3 upon Fig. 1; and

Fig. 4 is a horizontal section taken substantially on the line 4—4 of Fig. 1.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the improved tool consists of a substantially cylindrical body having its outside walls preferably formed by a cylinder 10, which may be formed of sheet metal, or in any other suitable manner. The upper end of the cylinder 10 is mounted upon a cap or head-piece 11, which has integral therewith a tapered pin 12, preferably squared in cross section, which is adapted to be received in the socket of a brace member of a brace and bit or the socket of a drill press, this socket being indicated at 13.

Within the cylinder 10 there are mounted two bearing blocks 14 and 15 which provide bearing surfaces for a spindle 16, which is axially slidable within the body of the tool. Upon diametrically opposite sides of the cylinder 10 there are formed slots 17 which receive projections in the form of pins 18 which are mounted upon the upper end of the spindle 16. The projections 18 cause the spindle 16 to rotate with the cylinder 10 which is rigidly mounted upon the cap or head-piece 11, but these projections permit the spindle 16 to vertically slide within the body. Between the bearing blocks 14 and 15 a coil spring 19 is arranged about the spindle 16. This coil spring bears against the upper bearing block 14 and upon a collar 20 rigidly mounted upon the spindle 16. The coil spring 19 serves to urge the spindle 16 downwardly for a purpose hereinafter to be described. The spindle 16 may be cylindrical in form and has its lower end flattened as indicated at 21.

Cutter members 22 and 23 are disposed upon the sides of the flattened portion 21 and a pin 24 extends through these cutter members so as to pivotally maintain them upon the spindle 16. These cutter members are approximately triangular in plan and have their cutting edges 25 formed upon angular portions 26. Within the cylinder 10 slotted angular members 27 are secured as by rivets or the like 28 and pins 29 are carried upon the cutters, which are slidable in slots 30 formed in the slotted angular members.

As clearly shown in Fig. 3, portions of the cylinder 10 adjacent its lower end are cut away, as indicated at 31, to provide slots through which the cutters may be projected

or may be retracted within the body. When the cutters are projected, these slots enable shavings cut by the cutters 22 and 23 to enter the body.

About the cylinder 10 there is slidable a ring 32, which is adapted to engage the projections 18 upon the spindle 16 and upon upward movement of the ring, the spindle 16 may be lifted against the action of the coil spring 19. Upon the upper bearing block 14 there is mounted a bracket 33 upon which is pivoted a pawl 34 which is urged outwardly through a slot 35 formed in the cylinder 10 by a leaf spring 36 which bears against the spindle 16. When the ring 32 is raised above the upper end of the slot 35, lifting with it the spindle 16, the pawl 34 will be pressed out through the slot 35 and will engage upon the under side of the ring so as to maintain it together with the spindle 16 in lifted position, wherein the cutters 22 and 23 will be retracted within the body.

In the operation of the device, the work W having the hole H formed therein is placed beneath the tool when applied upon a drill press and the tool is lowered into the hole until the lower edges of the cylinder 10 engage the bottom. In this position the tool may be rotated and while rotating, the pawl 34 may be pressed inwardly against the action of the spring 36, permitting the ring 32 to slide downwardly upon the cylinder 10 over it. This permits the spindle 16 to be forced downwardly by the spring 19. The downward movement of the spindle 16 swings the inner ends of the cutters 22 and 23 downwardly and projects their lower corners outwardly from the body, as illustrated in Fig. 2. The pins 29 which slide in the slots 30 formed in the slotted angular members 27 keep the cutters in proper position when they are projected by the spindle 16.

In the preferred form of construction, the lower edges of the cutters 22 and 23 are flush with the bottom edges of the cylinder 10, so that when the cutters are fully projected, they will engage upon the bottom of the hole together with the bottom edges of the cylinder 10. The cutting edges 25 formed upon the angular portions 26 are upwardly and inwardly inclined toward the surface of the body of the tool when the cutters are in expanded position, and in this manner outwardly flare the bottom of the hole. When the hole has been flared, the ring 32 may be grasped while the tool is rotating and lifted, engaging the pins 18 and lifting the spindle 16 against the spring 19. As it moves upwardly beyond the upper end of the pawl 34, this pawl will spring outwardly and engage upon the under side of the ring, thus maintaining the spindle 16 in elevated position, and maintaining the cutters 22 and 23 in retracted position within the body of the tool. When the hole has been flared, the dowel pin or other pin construction adapted to be connected to the work W, may be inserted in the hole H having a wedge in its bottom. This wedge may be partially driven into the dowel pin or may be placed in the bottom of the hole H. When the pin is driven home, the wedge will spread the bottom of the pin to occupy the flared portion, indicated at F, of the hole H and thus efficiently lock the pin in the hole. Glue may be placed upon the pin or in the hole, or upon both upon driving the pin into the hole H.

The downward movement of the ring 32 may be limited by a projection, indicated at 37, which may be formed upon the cylinder 10. The slotted angular members 27 are so arranged within the cylinder 10 as to bear against the sides of the cutters 22 and 23, and assist the edges of the cylinder 10 formed by forming the slots 31 in rotating the cutters with the body of the tool, so that the cutters will not chatter, but will easily and smoothly cut the flared portion F in the work W.

From the above it is seen that a tool for flaring holes is provided, which will flare only the bottom of the hole, leaving a large amount of bearing surface in the hole adapted to bear against the sides of the pin which is thrust therein, and that means is provided for projecting and retracting the cutters from the body of the tool without stopping its rotation, so that the tool can be easily and efficiently used upon a drill press, if so desired.

It will be understood that various changes in the detail of construction may be made without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. A tool for flaring holes comprising a cylindrical body, a spindle slidable in said body, cutters adapted to be projected by said spindle, said cutters having bottom edges which, when the cutters are projected, assume a position flush with the bottom of said body, and side cutting edges arranged at an acute angle to the bottom edges and which, when the cutters are projected, assume a position upwardly and inwardly inclined.

2. A tool for flaring holes comprising a cylindrical body, a spindle slidable in said body, cutters adapted to be projected by said spindle, said cutters having bottom edges which, when the cutters are projected, assume a position flush with the bottom of said body, and side cutting edges arranged at an acute angle to the bottom edges and which, when the cutters are projected, assume a position upwardly and inwardly inclined, said cutters being pivoted upon said spindle, members secured to the body and having

slots, said cutters having pins guided in the slots for guiding the cutters into their projected positions.

3. A tool for flaring holes comprising a body, a spindle slidable in said body, cutters pivoted to said spindle and adapted to be projected beyond the sides of the body, members fixed in the lower end of the body, and pins carried by said cutters which are guided by slots in the members to assist in extending or withdrawing the cutters.

In testimony whereof I have signed my name to this specification.

PHILLIP P. LEWIS.