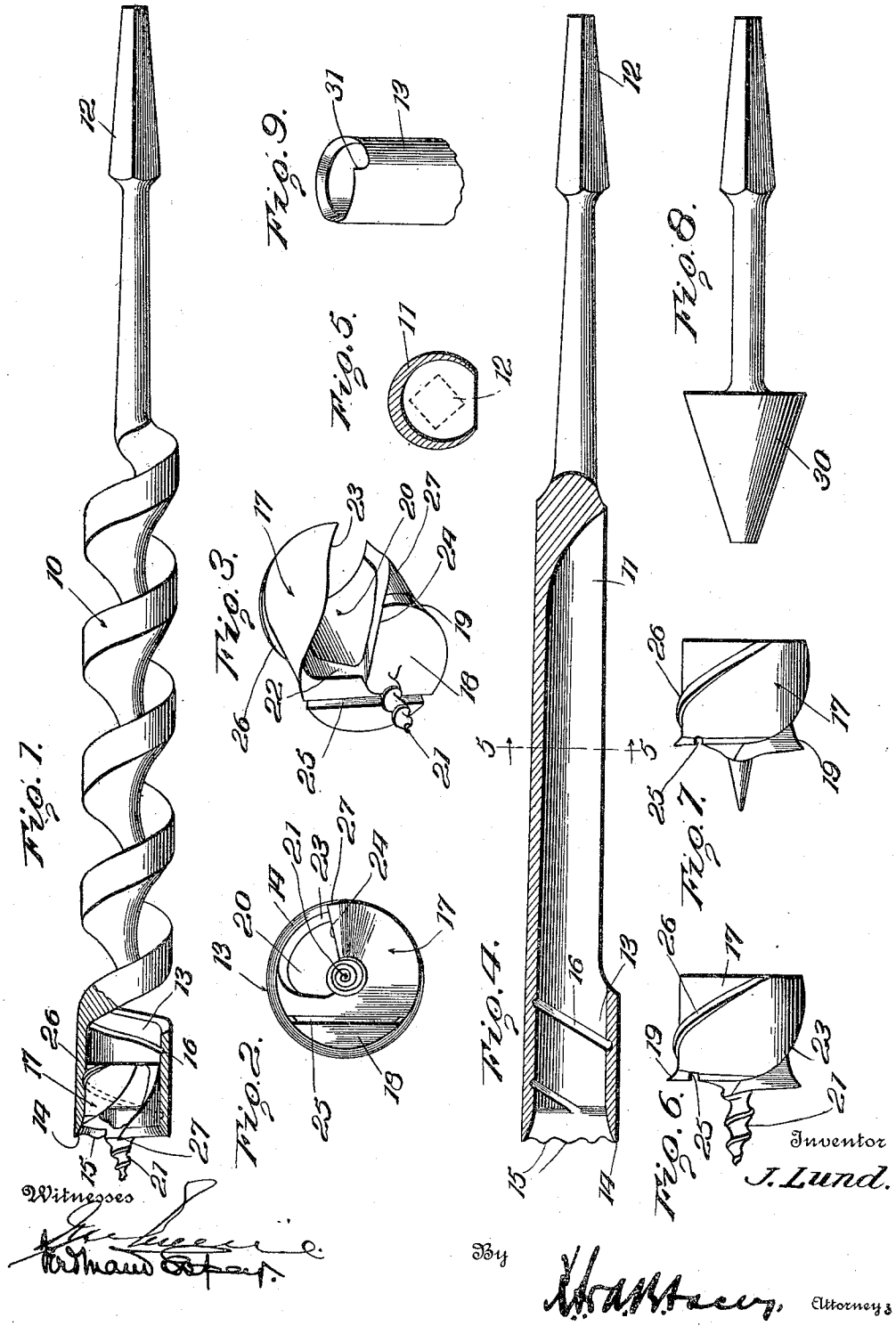
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AUGER.

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To all whom it may concern:

Be it known that I, JOEL LUND, citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Augers, of which the following is a specification.

My invention relates to new and useful improvements in bits for boring and the object of my invention is to provide a bit having detachable, interchangeable cutting heads provided with feed screws of varying pitches and shapes to adapt the bit for use with various kinds of wood and other material.

A further object of my invention is to so construct the bit and cutting head that the cutting head may be positioned in place and absolutely held against any independent movement during use of the bit without the necessity of any keys, feathers, wedges or similar locking devices now often used for this purpose.

A further object of my invention is to so construct the parts of the bit as to permit of continued sharpening of the bit proper and subsequent resetting of the cutting head in the bit so sharpened, thus greatly increasing the life of the tool. And a still further object of my invention is to provide a bit of the above described character which may be expanded slightly if necessary, and which may be later reduced to normal size, if desired.

With these and other objects in view, my invention will be more fully described, illustrated in the accompanying drawing, and then specifically pointed out in the claims which are attached to and form a part of this application.

In the drawing: Figure 1 is a side elevation partially in section of my improved bit; Fig. 2 is an end view of the same; Fig. 3 is a perspective view of the cutting head removed from the bit; Fig. 4 is a central longitudinal sectional view of a modified form of bit construction, the cutting head being removed to more clearly show the cutting terminal of the bit proper; Fig. 5 is a section on the line 5—5 of Fig. 4; Fig. 6 is a side elevation of one of the cutting heads employed in connection with my bit, showing a feed screw of greater pitch than that shown in Figs. 1 and 3; Fig. 7 is a similar view, showing a different form of feed or centering device; Fig. 8 is a side elevation of a conventional reamer employed in expanding my improved bit. Fig. 9 is a fragmentary perspective of a modified form of cutting terminal.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawing by the same reference characters.

My improved bit construction may be embodied in any bit of conventional type, the sole difference in construction consisting in the shaping of the free end of the body of the bit and in the provision of a detachable cutting head. I have therefore illustrated the device in connection with two well known forms of bit construction, namely, the bit 10 as shown in Fig. 1 of the drawing, said bit being of the spiral chip conveyer type and the bit 11 of the hollow cylindrical conveyer type as shown in Figs. 4 and 5 of the drawings, both these bits being provided at their ends with the usual stock engaging shank 12.

The opposite ends of the bits 10 and 11 are each provided with an integrally formed, hollow cylindrical terminal 13 forming the cutting end of the bit and as these terminals are identical in construction a description of one will suffice for both. As shown, each of these terminals is in the form of a cylindrical shell, the free end of which is flared outwardly slightly and internally beveled to form a scalloped edge 14 having a plurality of spaced cutting blades or teeth 15. These shells are further provided interiorly with a screw thread 16, the purpose of which will be hereinafter more fully explained.

With a bit of the construction thus far described, I employ one of a plurality of detachable cutting heads which, for the greater part, are identical in construction. Each of these cutting heads corresponds in shape externally to the internal shape of the cutting terminal of the bit body proper, the bodies of said heads 17 being cylindrical in shape with their outer ends closed as shown at 18 and flared slightly as shown at 19. The cutting head is provided in its inner end with a recess 20 in the form of a cylindrical socket and extending outwardly from the central portion of the end face of the cutting head is a feeding screw 21. The end face of the head is slotted radially from this screw as shown at 22 and this slot is continued through the body as shown

at 23 to form a spiral chip receiving channel communicating throughout its length with the recess or socket 20 of the cutting head.

The outer face of the cutting head is inclined circumferentially as best shown in Figs. 1 and 6 of the drawing from one side of the slot 22 to the other and beveled interiorly to provide a pod cutter. 24. This face is further provided with a groove or channel 25 adapted to receive the terminal of a screw driver. The outer face of the body of the cutting head is provided with a screw thread 26 equal in pitch to the thread 16 of the cutting terminal of the bit and adapted for threaded engagement therein.

As best shown in Fig. 1 of the drawing, the pitch or circumferential inclination of the face of the cutting head should be the same as the pitch of its feed screw and the flaring of the outer end of the cutting head body should correspond to the beveling of the inner face of the cutting terminal of the bit in such a manner that when the cutting head is threaded into place on the cutting terminal of the bit it will bear throughout its entire peripheral face against the inner face of the cutting terminal of the bit with the advanced point 27 of its pod cutter in a plane with the cutting teeth 15 as shown in Fig. 1.

The interior thread 16 of the cutting terminal is continued a considerable distance beyond the inner end of the cutting head, as shown, in order to permit repeated sharpening of the cutting edge of said terminal and the subsequent resetting of the cutting head therein. Because of this, the life of the bit is practically unlimited, particularly if a set of three or more cutting heads are provided with each bit. In this latter case, it is preferable to provide cutting heads having feed screws of different pitches, as illustrated in Figs. 1, 6 and 7 of the drawing, the cutting heads therein shown being otherwise identical in construction.

The feed screw shown in Fig. 1 is of relatively small pitch and is intended for use in boring hard wood, while the feed screw in Fig. 6 being of larger pitch is intended for use in soft wood. The feed device in Fig. 7, consisting merely of a triangular tooth or wedge, is intended for use in extremely soft wood or brittle material and prevents splitting of the same, its use being more as a centering device than as a feed device.

If desired, the gage of the bit may be slightly increased by the employment of a conical ream 30 which may be inserted in the free end of the cutting terminal of the bit and forced inwardly during rotation to slightly expand the same, increasing the flaring thereof. When so enlarged, the cutting head will be turned in to a somewhat greater distance to engage snugly against the wall of the cutting terminal. If, for any reason, it should again become desirable to reduce the bit to normal size, this may be done by rolling its cylindrical portion under pressure, between steel or iron plates.

As clearly shown in the drawing, the threading of the inner face of the cutting terminal and of the exterior face of the cutting head is such that during the employment of the bit, all force exerted upon the cutting head will tend to tighten the same and lock it in place in the bit. As the cutting terminal or shell 13 of the bit extends slightly in advance of the cutting head, it will be apparent that with the exception of what little strain upon the cutting head is necessary in threading the feeding screw thereon, no strain will be applied thereon during the removal of the bit from the hole bored and all danger of disengagement of the cutting head from the bit is therefore avoided.

By providing the screw driver terminal receiving slot in the outer face of the cutting head, I insure a simple and efficient means for removing the cutting head from the bit, when desired, irrespective of how firmly it may have become wedged in place by use. The flaring of the outer end of the cutting head and shell of the bit provide bearing surfaces for preventing the cutting head from turning too far into the shell and thus to a great extent overcome any extreme wedging action of the head in the bit.

By forming cutting spurs or teeth entirely around the circumference of the cutting terminal of the bit, the bit, during use, cuts the wood or other material being bored evenly and will therefore move in a straight line instead of following the grain of the wood as often happens with bits having but one, or at the most, two cutting teeth. On the other hand, it is sometimes convenient, particularly when using a bit with such work as will require a constant and frequent sharpening of the bit, to employ one having but a single cutting lip or tooth, a bit of this type being illustrated in Fig. 9 in which the cutting terminal 13 is provided with but a single tooth 31. In this form of bit, and in fact in the other forms illustrated, the inclination of the cutting tooth or teeth, as the case may be, should correspond with the inclination of the cutting head engaging threads. Because of this, when the teeth or spurs are sharpened, the extreme or sharp point of the cutting head which is made, at the beginning, to bear against one of the spurs, will always recede in a corresponding degree with the spur as this is worn down and resharpened. Because of this, the point of the cutter head and the point of a certain spur will always come together, irrespective of how often the bit has been sharpened.

As clearly shown in Fig. 3 of the drawing, the portions of the cutting head forming the edges of the slot 23 are beveled interiorly to provide sharp edges which prevent the choking up of the cutting head by chips. In this same connection it should be noted that the bit shown in Fig. 4 tapers slightly from its cutting to its inner end and will therefore not bind in the hole as the boring continues. For this reason, it is particularly adapted for use in boring silicated or pitchy material which will choke up and seriously bind a bit of the usual construction. The ream 30 is most commonly used with this type of bit and is merely employed in this instance, to slightly expand the cutting edge of the bit and so give it a slight additional clearance to further insure against any binding of the bit in the bore.

From the foregoing description it will be apparent that I have provided an extremely simple and useful form of tool, but it will be understood that I do not wish in any way to limit myself to the specific details of construction illustrated in the drawing and described in the specification, as minor changes, within the scope of the claims, may at any time be made, if desired, without in the slightest degree departing from the spirit of my invention.

Having thus described the invention, what is claimed as new is:

1. A bit including a body terminating in a hollow cylindrical shell internally threaded and internally beveled at its free end to form a cutting edge, and a cylindrical cutting head externally threaded to engage with the threads of the shell and slotted radially and beveled to form a pod cutter, said head being hollow to permit the passage of chips.

2. A bit including a body terminating in a hollow internally threaded shell, a hollow cylindrical body member threaded in the shell and provided at its free end with a centrally formed feed screw and with a radially extending slot providing a pod cutter, the body of said head being provided with a spiral slot communicating with the first slot and with the hollow portion of the body, the end of said head being provided with a screw driver receiving groove.

3. A bit including a body terminating in a hollow cylindrical shell, the free end of which is flared outwardly and beveled to form a scalloped cutting edge, and a cutting head having threaded engagement in the shell and with its outer end flared to seat against the inner face of the flared portion of the shell to limit the inward movement of the head within the shell.

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

JOEL LUND. [L. S.]

Witnesses:
L. B. FITCH,
W. J. MITCHELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."