

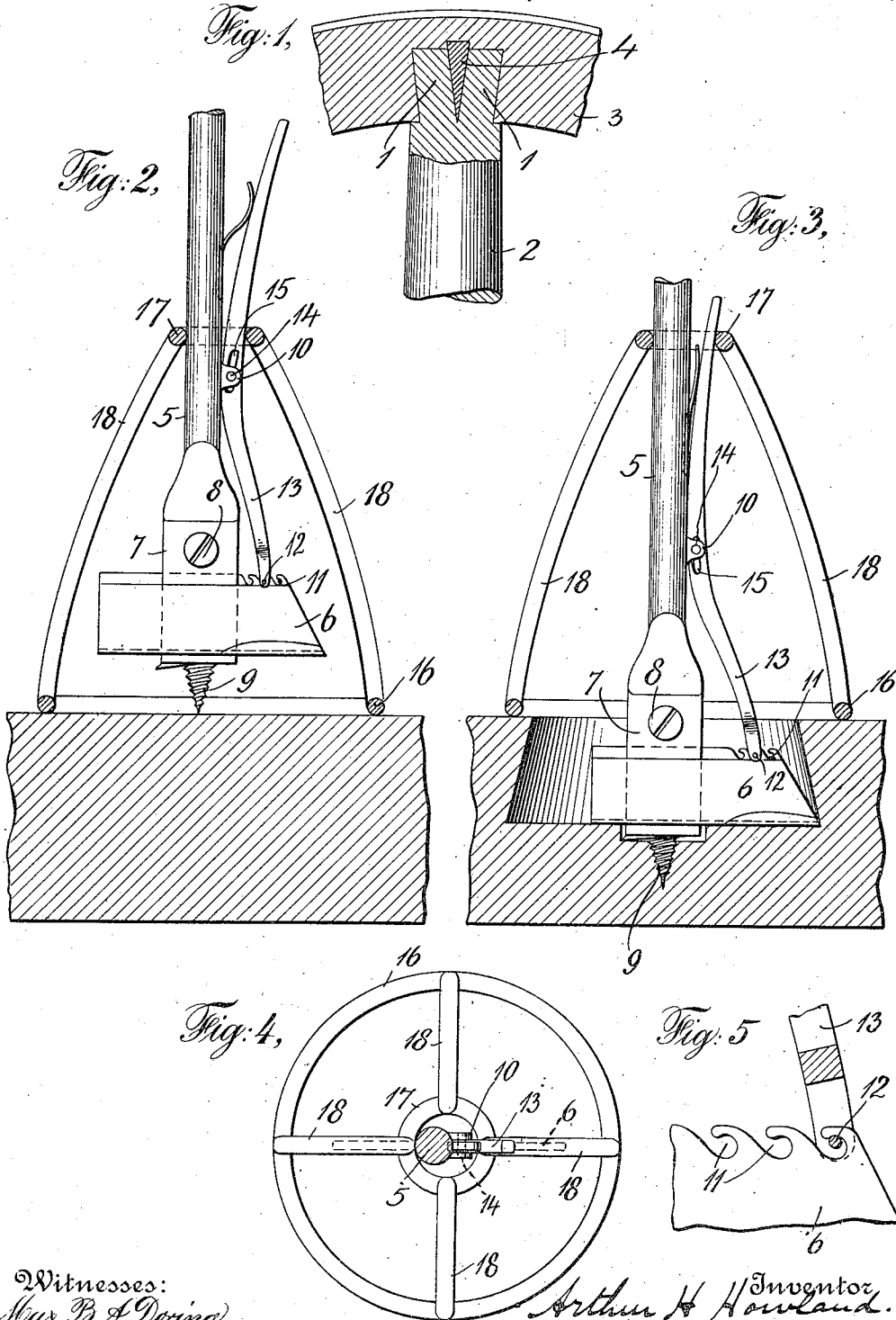
A. H. HOWLAND.

AUGER.

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955,803.

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Witnesses:
Max P. A. Doring
F. M. Donsbach

Arthur H. Howland. Inventor.
Phillips Abbott. By his Attorney.

UNITED STATES PATENT OFFICE.

ARTHUR H. HOWLAND, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO ELLA M. HOWLAND, OF NEW YORK, N. Y.

AUGER.

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To all whom it may concern:

Be it known that I, ARTHUR H. HOWLAND, a citizen of the United States, and a resident of the city of Worcester, county of Worcester, and State of Massachusetts, have invented a new and useful Bit or Auger, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 illustrates a sectional view through a portion of the felly of a wheel, with the tenon on the end of a spoke confined in a hole bored in the felly with a bit or auger made under this invention. Fig. 2 illustrates a view, partly in elevation, and partly in vertical section, of a tool embodying the invention, showing the position of the parts at the commencement of the boring operation; Fig. 3 illustrates a view similar to Fig. 2, showing the position of the parts at the completion of the boring operation; Fig. 4 illustrates a plan view of the frame which actuates the controller lever. Fig. 5 illustrates a detail of certain of the parts.

The invention contemplates new and useful improvements in bits or augers whereby the cutting edge of the tool will gradually expand as it is led or forced into the material in which it is desired to bore the hole, with the result that the walls of the hole will themselves diverge, in other words, be tapered. The invention is such, moreover, that with the same tool, a straight or an expanding hole may be bored, and the holes may have a fixed rate of expansion, as may be useful when the tool is to be used for one particular kind of work throughout its life; or they may have different rates of expansion, depending upon the shape and location of the parts which determine these features, as will be readily understood from the following. Also the initial diameters of the holes to be bored may also be varied. The variations mentioned are desirable since they adapt the tool to miscellaneous as well as regular work.

I accomplish the above-mentioned results by constructing the bit or auger, with its cutting and controlling parts made substantially as shown in the accompanying drawings. Other equivalent constructions may be employed for bits or augers intended for special work, but that shown in the drawings will illustrate the principles applicable to all.

Referring to the drawings, in Fig. 1, 1, 1, represent the two halves of the tenon of a spoke 2 entered into an expanded hole bored in the felly 3 of a large wheel and spread therein by the introduction of a wedge 4 in a split or saw kerf made in the end of the spoke.

Referring now to the other figures, 5 represents the shank of an ordinary expansion bit, 6 the knife or cutter, 7 the clamp plate, 8 the clamp screw, 9 the leading gimlet point. All these parts are, or may be as usual.

10 is a lug made on the side of the shank which is slotted in its vertical axis.

11 are a series of undercut notches made in the upper edge of the knife in which a cross pin 12 engages which spans the bifurcated lower end of a lever 13, which is fulcrumed at 14 in the lug 10. The lever 13 which I call the controller is slotted at 15 where the fulcrum pin goes through it, so that as the lower end of the lever moves outwardly, the entire lever may slide downward, thus avoiding any jamming in the parts which would otherwise occur if the radial movement was considerable, which is apt to be the case in bits adapted to the range of size variation common in expansion bits.

The above described parts are all that constitute the bit or auger proper, but in order that the cutter 6 may be made to move radially as the bit or auger is drawn or forced into the material in which the hole is being bored, various mechanical devices may be employed, one form of which is shown in the drawings. It is composed of the following elements. 16 represents a ring that rests on the surface of the material in which the hole is to be bored, 17 a smaller ring which encircles the shank 5 and 18 one or more connections between the two. When the bit or auger is placed against the material and all the parts are, for example, in the position shown in Fig. 2, then the shank being revolved, the cutter or knife will cut away the material and all of the bit proper will be gradually drawn into the hole thus being bored; but while this is being done, the encircling rings 16 and 17 with their connections 18 cannot enter the hole, on the contrary, these parts rest against the surface of the material while the bit or auger is gradually drawn or forced down through them, and as this takes place, the upper end

of the lever 13 is gradually forced toward the shank by the encircling upper ring 17 and the lower arm of this lever is correspondingly forced radially outward, and thus the cutter 6 is made to move radially and cut a circle having a constantly increasing diameter and thus the expanded hole is bored. I prefer to make the notches in the upper edge of the knife undercut, as shown, so that there will be more reliable engagement between the cross pin 12 of the lever and these notches. Other equivalent constructions may be employed for all these parts.

In operation the clamping screw 8 is loosened to such an extent that the clamp plate 7 will permit the knife, which should be well oiled, to slide laterally past it. The pin 12 of the lever 13 will of course be engaged in such one of the notches in the knife as will give the hole the desired diameter.

In order that the tool may be used as an ordinary expansion bit, I prefer to make the upper ring 17 of such size that when the knife and the lever are removed from the shank, the encircling standard will drop off from the end thereof, thus leaving the tool in the condition of an ordinary expansion bit.

It will be obvious to those who are familiar with such matters that the details of the construction illustrated and described may be departed from and still the essentials of the invention be retained. I therefore do not limit myself to such details.

I claim:

1. In a tool of the class stated, a shank, a cutter carried by the shank and radially

movable relative to it, a controller lever provided with a slot and pivotally supported upon the shank through the slot, means upon the lower member of the lever, whereby it may be adjustably engaged with the cutter and a device carried by the shank and which engages the upper member of the controller lever and past which the latter moves when the tool is operated.

2. In a tool of the class stated, a shank, a cutter carried by the shank and radially movable relative to it, a series of notches upon the upper edge of the cutter, a controller lever pivotally supported upon the shank and provided at its lower end with means whereby it may engage with the notches on the edge of the cutter and a device supported by the shank and which engages with the upper end of the lever and past which the latter moves when the tool is operated.

3. In a tool of the class stated, a shank, a cutter carried by the shank and radially movable relative to it, a controller lever provided with a slot and pivotally supported through the slot upon the shank, means upon the cutter and upon the lower end of the lever, whereby the two may be adjustably engaged with each other and a device carried by the shank and which engages with the controller lever and past which the latter moves when the tool is operated.

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

ARTHUR H. HOWLAND.

Witnesses:

GEORGE A. GASKILL,
FRANCES H. BENNETT.