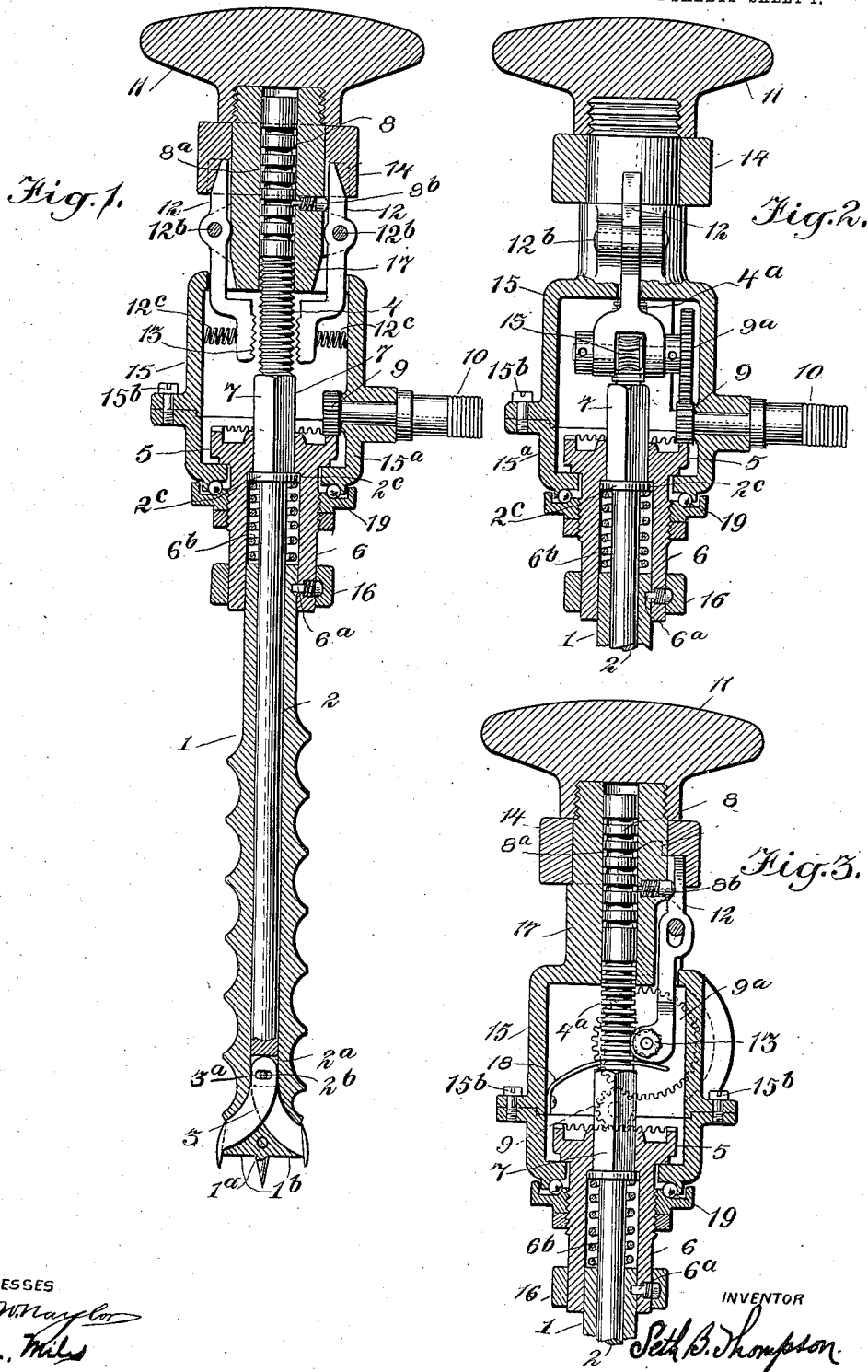


S. B. THOMPSON.
 AUGER FOR BORING REVERSED TAPER HOLES.
 APPLICATION FILED SEPT. 6, 1910.

1,013,970.

Patented Jan. 9, 1912.

2 SHEETS-SHEET 1.

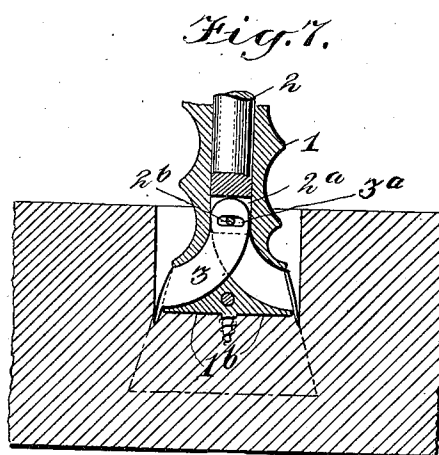
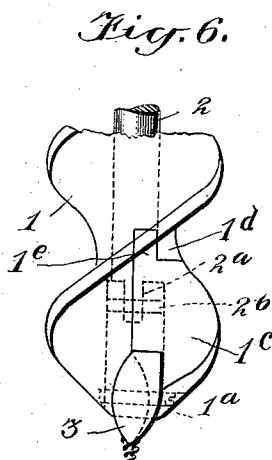
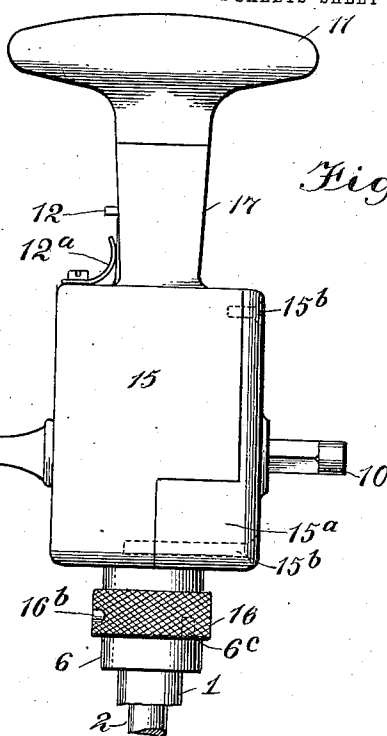
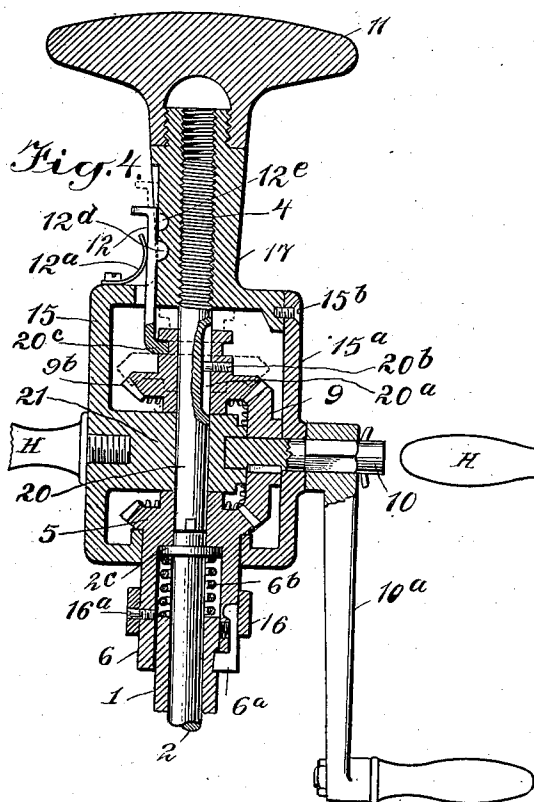


S. B. THOMPSON.
 AUGER FOR BORING REVERSED TAPER HOLES.
 APPLICATION FILED SEPT. 6, 1910.

1,013,970.

Patented Jan. 9, 1912.

2 SHEETS-SHEET 2.



WITNESSES

Geo. Maylor
W. C. Miles

INVENTOR

Seth B. Thompson.

UNITED STATES PATENT OFFICE.

SETH B. THOMPSON, OF JERSEY CITY, NEW JERSEY.

AUGER FOR BORING REVERSED-TAPER HOLES.

1,013,970.

Specification of Letters Patent.

Patented Jan. 9, 1912.

Application filed September 6, 1910. Serial No. 580,779.

To all whom it may concern:

Be it known that I, SETH B. THOMPSON, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Augers for Boring Reversed-Taper Holes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of the present invention is to construct a brace and bit or auger, in combination, that will enable the operator to form a straight-sided hole, or a hole that gradually and uniformly enlarges in size as the boring proceeds; and it consists in the construction, combination and arrangement of parts as hereinafter shown and described and specifically pointed out in the claims. Applicant, in the construction of a machine of this character, employs a specially constructed brace and bit made up of two detachable parts, which parts are interdependent and cannot be operated separately. Two separate and independent mechanisms are also embodied within the frame, to perform two different operations; and each mechanism is operated by and connected to the same power. The mechanism in the upper portion of the brace, arranged to be disconnected or thrown out of gear, is employed solely for the purpose of exerting a downward pressure on the plunger or rod running through the tool, thus forcing the knives which are detachably attached thereto, to spread while cutting. The mechanism connected to the gearing in the lower portion of the brace is employed solely for the purpose of rotating the auger or bit and plunger. Consequently when the upper mechanism is disconnected or thrown out of gear, a straight-sided hole only can be bored; but when both mechanisms are in action or operation, a reversed taper hole is the result. This is made possible by the knives expanding gradually while eating their way into the wood.

In the accompanying drawings, Figure 1 represents a vertical sectional view of the improved boring tool, showing plunger shaft and side view of the expanding knives. Fig. 2 is a vertical sectional view of the upper portion of the tool, showing one of the devices employed to give a downward movement to the plunger. Fig. 3 is

also a vertical sectional view of the device shown in Fig. 2, only in a different position. Fig. 4 is a modified form, with the lower portion broken away, showing the plunger constructed of two parts. Fig. 5 is a detailed sectional view showing means of connecting the brace and bit, and of transmitting power from brace to bit. Fig. 6 is a detail elevation of the cutting head of the auger, showing an edge view of the expanding knives and removable portions of the auger casing. Fig. 7 is a detailed sectional view of the cutting head of the auger or bit, showing the knives partly expanded in an unfinished hole.

In the construction set forth, applicant presents several devices employed for the purpose of producing a downward pressure on the plunger employed in connection with the auger.

In the preferred form of the device (shown in Fig. 1 of the drawings) applicant employs levers with a split thread adapted to engage a thread cut upon the upper portion of the plunger.

In Figs. 2 and 3 a gear-wheel is employed which meshes the main gear and rotates a pinion which in turn engages a rack in lieu of the thread cut upon said plunger, as aforesaid.

Fig. 4 of the drawings presents a modified form of the device in which the plunger is constructed of two pieces with a thread cut upon the upper end that will work in a screwhead in the neck of the device, and thus give a downward pressure to the lower portion of the plunger as the same is being rotated. Attention is also directed to the fact that in the preferred form of the device, illustrated in Fig. 1, the feed screw can be cut to such a length that when the knives have arrived at their limit of extension, the split thread will run off the feed screw and the downward pressure cease, thus affording an automatic safety stop.

Applicant is aware that boring tools have been made and patented in which expanding knives are employed; but the expanding of the knives was always controlled by thumb screws or else the feeding mechanism was held at rest by the hand of the operator while the bit was rotated. In the present invention, however, mechanical means to automatically feed and control the expanding of the knives is employed.

In the drawings the numeral 1 represents

a hollow auger, through the channel of which runs plunger 2 extending generally up into the brace to connect with divers means to give it a downward pressure. The plunger may be made of one solid piece or it may be constructed of two or more parts, as may be preferred, or required, having at the lower end of said plunger one or more cutting knives designated by numeral 3 detachably attached thereto. Upon the upper end of the plunger a thread screw 4, or a rack 4^a or an equivalent may be employed to engage means to give it a downward pressure.

9 represents the main gearwheel attached to shaft 10 by or through which operating power is transmitted generally by means of a flexible shaft. This mechanism is supported by frame work 15 and 15^a necessary in the make up of the brace; the same may be made in the form shown or otherwise as may be preferred.

15^b is the means sometimes employed to connect said frame work.

The numeral 5 is a gear that meshes the lower face of the main gear to which is connected sleeve or hub 6 in which the auger and plunger are inserted and detachably attached thereto.

7 represents a squared portion of the plunger sometimes employed to engage gear 5. At the upper end of the plunger represented by numeral 8, is a series of annular grooves 8^a and pin 8^b employed to lock into the grooves in a manner that is obvious. Located on each side of the handle 11 are levers 12 having a split thread 13 at the lower end adapted to engage thread 4. Said levers are held in place by pivot 12^b. Now it is obvious since the levers swing on 12^b that either the split thread may engage the feed screws or pin 8^b may be held in one of the grooves on the plunger; but both conditions cannot exist at the same time. Both the pin and the split thread may be held out of contact, however, at a certain point by the levers, thus allowing the plunger, by the means of spring 6^b (located within the hub resting on the top of the auger and held in place by shoulder 2^c), to move up into its original position.

Numeral 14 represents a ring sometimes employed over the ends of the levers, having the proper cam faces to produce the right position of the pin and split thread as the ring is turned. The spring 12^c may sometimes be employed in the adjustment of the levers for the purpose of forcing the levers against the feed screw in a manner that is obvious. The knives 3 are connected to the plunger by pin 2^b, working in slot 3^a. Any other means may be employed.

1^c is the removable portion of the bit or auger, arranged so as to afford access to the knives detachably attached. This portion

is held in place by groove 1^c formed behind shoulder 1^a at the upper end of slot, and pin or screw 1^a at the lower end.

1^b is the lower end of the auger upon which the cutting knives rest, spreading or contracting as the plunger is manipulated. It will be noted that the tracing edges and paring blades with a center point or draw screw may be connected with this aforesaid removable portion, if preferred, thus making it possible to replace these parts.

Numeral 19 represents a ball bearing which may be located as shown or otherwise as may be preferred, or it may be entirely omitted; also the cam-faced ring employed as aforesaid, may be dispensed with, and the levers controlled by hand.

Numeral 16 represents a cam-faced ring employed in the connection of the auger and brace by pin 6^a. There are many ways and means known and in use whereby brace and bit may be detachably attached; consequently applicant does not confine himself to the means set forth. Figs. 2 and 3 illustrate the device shown in Fig. 1 with the exception that rack 4^a is employed (in the place of thread 4) upon the upper end of the plunger adapted to engage pinion 13^a which is operated by a gearwheel 9^a that meshes the main gear 9; thus a downward movement is given the plunger.

18 is a spring sometimes employed to assist in throwing the gearing out of engagement.

In the modified form illustrated by Fig. 4 in the drawings, a device is presented in which the plunger is made up of two parts or sections. Upon the upper end of plunger, (section 20) left-handed thread 4 is cut (a right-hand thread may be used) adapted to work on screw head located in casing 17. Movably attached to said plunger is gearwheel 9^b connected by pin 20^b working in slot. Now when said gear is in position, it engages the main gear 9 on its upper face giving the plunger a right to left rotary motion, accompanied by a downward motion caused by the screw working in the screwhead, and this action causes one or more knives attached to the lower end of the plunger to spread while cutting. This mechanism can be disengaged by yoke 20^c to which is attached handle 12. Now when the gearwheel is thrown out of engagement ear 12^d on handle is pressed into recess 12^e by spring 12^a and held. It will be noted that by a reverse motion of the crank, the upper portion of the plunger being lifted, the parts will return to their normal position by the action of spring 6^b. As aforesaid, the numeral 5 represents a gear to which is connected hub 6. In the latter both auger and plunger are inserted, and detachably attached thereto as in the preferred form, but the means employed to hold

the same in place is somewhat different. 6^a represents a series of dogs employed having round heads, the lower end fitting into the recess on auger thus locking it to gear 5 (illustrated in Figs. 4 and 5) and held in place by cam-faced band 16, which rotates on hub 6 so as to register the openings 6^c over the dogs 6^a when the removal of the auger is desired. H is a handle sometimes connected to the tool and may be located at the place shown or otherwise. 10^a is a handle generally employed in the modified form shown in Fig. 4 in which 21 represents a portion of the frame in use.

15 It will be noted that in the construction of the boring machine, the means employed to give a downward movement to the plunger, and the means employed to connect the auger and plunger to the gearwheel, also the means employed to attach the cutting knives are not of themselves new, 20 neither do they represent the only mode now in use that can be employed to carry out, in each case, the purpose of the inventor. 25 Consequently, it will be understood that applicant does not confine himself to the details of construction shown, as they may vary, and the essentials of the invention still be employed.

Having thus described my invention, 30 what I claim as new, and desire to secure by Letters Patent is:—

In a tool for boring a reversed taper hole, the combination with main gear and means to rotate the same, together with the general framework necessary in the make up 35 of the brace, hollow auger 1, and plunger 2, running through the center of said auger, both of which are connected to the gear by which they are rotated, cutting knives detachably attached to the plunger at the 40 lower end and means at the upper end to engage the mechanism which gives the plunger a downward movement, means to throw said mechanism in and out of engagement, means to connect auger and 45 plunger to gearwheel, also means to connect the knives detachably attached to the plunger, substantially as and for the purpose set forth. 50

In witness whereof I have hereunto signed my name, in the presence of two subscribing witnesses.

SETH B. THOMPSON.

Witnesses:

W. C. MILES,
M. L. THOMPSON.

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