No. 626,474. Patented June 6, 1899.

W. H. AMES.

HAND BRACE DRILL ATTACHMENT.

(Application filed Dec. 22, 1898.)

(No Model.)

Fig. 1.

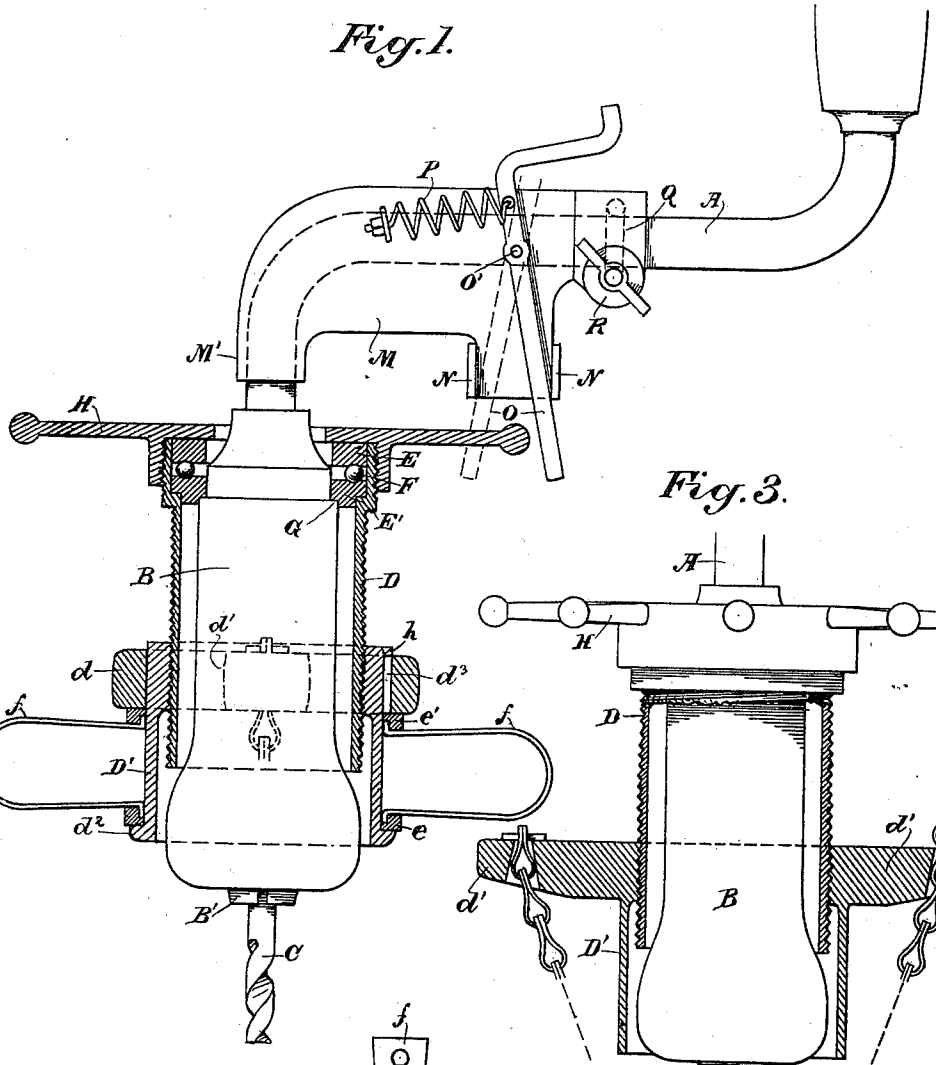
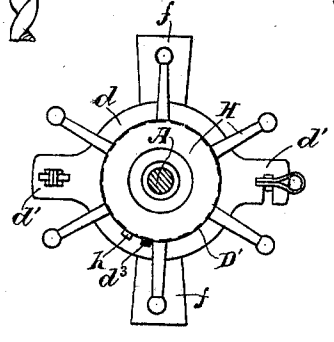


Fig. 3.

Fig. 2.



Witnesses,
P. Towse
H. F. Ascheck

Inventor,
William H. Ames
By Dewey Thacher & Co.
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. AMES, OF WATSONVILLE, CALIFORNIA.

HAND-BRACE DRILL ATTACHMENT.

SPECIFICATION forming part of Letters Patent No. 626,474, dated June 6, 1899.

Application filed December 22, 1898. Serial No. 699,986. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. AMES, a citizen of the United States, residing at Watsonville, county of Santa Cruz, State of California, have invented an Improvement in Hand-Brace Drill Attachments; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an attachment for the ordinary wood-boring-bit-holding stock or brace, by which it is rendered capable of being employed in connection with a metal-boring bit.

It consists in the parts and the constructions and combinations of parts, which I will hereinafter describe and claim.

Figure 1 is a sectional view of my device. Fig. 2 is a plan view of the same. Fig. 3 is a modification showing the chain-carrying arms and outer sleeves as being integral and without the springs.

The bit stock or brace A may be of any usual or suitable construction, having the breast-piece or cap at the upper end, by which it can be steadied against the person, if desired, and the part B turnable upon the lower end and adapted to close the clamps B′, by which the boring-tool C is firmly held therein. This being the usual construction for this class of tools is not shown in detail.

My invention is designed to enable the operator to bore any metal with the usual metal-boring drill and to advance the latter as the cut proceeds without depending upon pressure upon the head of the bit-stock, and particularly relates to an improvement in the devices by which this is effected.

D is a sleeve which is screw-threaded upon the outside and which is of such diameter as to loosely inclose the part B. This sleeve fits into an extension D′, the upper part of which is screw-threaded to fit the corresponding threads of the sleeve D, and the lower part extends down, so as to loosely fit around the enlarged swell or lower end of the part B, so as to serve as a guide to retain the parts in place.

When it is desired to remove the bit C or to replace one in the shank, it is necessary to turn the part B with relation to the interior clamp B′, which holds the bit, and in order to obtain access to this the extension D′ may be screwed back upon the sleeve D, if it is near the upper end, or if it is near the lower end it can be entirely screwed off, so as to leave the lower part of B exposed and enable the operator to grasp it and turn it for the purpose above stated.

When the bit is in use, the extension D′ extends down, so as to approximately inclose the lower enlarged end of the part B and, as before stated, form with it a guide for the lower end of the sleeve to steady it and keep it in position.

Surrounding the upper end of the sleeve D′ is a loosely-slidable yoke d, with projecting arms d', which are adapted to receive a chain or other flexible connection of sufficient length to extend down around the object to be bored, one end being permanently attached to one of the arms d' and the other end being adjustably attached to the other arm, so that when the point of the bit rests against the object the chain may be shortened up and attached to the arm, so as to retain the bit in contact with the object to be drilled.

The lower end of the sleeve D′ has an outwardly-turned flange or bead d^2, and a loose ring e surrounds the sleeve and is prevented from slipping off by the flange. A similar slidable ring e' surrounds the sleeve higher up, and the lower part of the yoke d rests upon this ring. These rings have grooves or slots made in their inner edges to receive and hold the inturned ends of springs f, which press outwardly against the rings with any desired force. Spiral or other suitable springs may be used. In the present case a plurality of flat springs are shown, curved upon themselves, so that the ends engage the rings with an outward or separating pressure. The yoke d has a vertical slot d^3 cut in it, and a pin h projects from the sleeve D′. By pushing the yoke d down until the pin is above it and then turning the latter it will be held down by the pin. The action will be as follows: When the hand-wheel H is turned to screw the sleeve D into the sleeve D′, the tension of the chain which connects the part to be drilled with the arms d' will cause this and the upper ring e' to slide down on the sleeve D′ and will thus compress the springs f, and these will then exert a constant pressure upon the yoke d and the connected chains and will

hold the drill to its work until the parts have returned to their normal positions, when they may be again fed forward by turning the hand-wheel H as before.

The upper end of the sleeve D is chambered to receive the shells E and E′, which form a casing, both parts being interiorly grooved to receive the balls F, so that the two parts may turn freely upon one another. The part E′ of the casing has an annular flange or collar turned upon it, which fits against a corresponding shoulder G, turned upon the upper end of the shank B, as shown, and this guides and steadies the upper end of the sleeve and also forms a bearing against which the strain caused by the feeding of the drill forward while cutting is borne.

On the upper part of the sleeve D are projecting arms H, sufficient in number to be conveniently grasped by the operator, so as to turn the sleeve D within the extension D′ from time to time, thus drawing the extension D′ upwardly, and by the tension which is thus brought upon the chain the drill is advanced as the boring proceeds, as previously described.

It will be seen that the whole pressure and the power necessary to feed the drill forward in hard metal is supported upon the bearing E′ G, while the balls F allow the arms H and the sleeve D to be easily turned without sensible friction and without grinding or marring that portion of the bit-stock upon which the pressure is brought, while the bit-shank is also easily turned within the sleeve during the operation of boring. From time to time the sleeve D is turned to advance the drill as the work proceeds by drawing the extension D′ upwardly upon the sleeve D and with it the connected part in which the drill is working.

In order to rotate the sleeve D from time to time and provide for a self-feed while the work progresses, a lever-arm O is fulcrumed at O′ to a plate or support M, so that its upper end is within convenient reach of the hand which grasps and turns the cranked portion of the brace. The lower end extends between the arms H, so as to engage one of them and advance it when the lever is thus moved. A spring P, connected with the lever O, returns it to its normal position when released from pressure.

The plate M has a socket-piece M′, which secures it to the lower vertical end of the brace, and a hook-bolt Q, with a nut R, secures the opposite end to the lower horizontal parts of the crank-arm.

N N are two outwardly-turned flanges or lugs upon the plate M, which act as stops to limit the movements of the lever O in either direction. By this construction it is only necessary to press the lever O until it engages one of the arms H, when the latter will be turned until the springs *f* have been compressed to the desired tension, and the lever is then released and disengaged from the feed-wheel. The pressure of the spring continues to feed the drill forward, and both hands are left free to handle the brace.

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

1. A boring-brace having a drill-clamp at the lower end, a screw-threaded sleeve inclosing the upper part of the clamp, an interiorly-screw-threaded extension fitting and movable upon the sleeve to increase or decrease its length, a flexible connection from the part to be drilled and attachments upon the extension by which the length of the flexible connection is adjusted, a two-part ball-bearing casing fitting within the upper part of the sleeve, one portion of the casing having a bearing upon the upper end of the drill-clamp and the other part supported within the sleeve and turnable therewith.

2. The boring-brace and drill-clamp having a surrounding screw-threaded sleeve, a correspondingly-threaded sleeve turnable thereon, a yoke fitting said sleeve and slidable longitudinally with relation thereto, said yoke having a flexible attachment by which it is connected with the part to be drilled, and an elastic spring situated between the lower end of the sleeve and the yoke and exerting an upward pressure against the yoke substantially as described.

3. A boring-brace and drill-clamp with a surrounding screw-threaded turnable sleeve, an exterior screw-threaded sleeve turnable upon the first-named sleeve, a yoke slidable upon the exterior sleeve, springs by which it is normally pressed upward and a flexible adjustable connection between the yoke and the part to be drilled whereby the latter is held in contact with the boring-tool, arms radiating from the upper end of the interior sleeve, a lever fulcrumed to the brace adapted to be moved into line with said arms so that the arms and sleeve may be turned in unison with the movement of the brace and the yoke advanced to compress the spring substantially as described.

4. In a drilling apparatus of the character described, a screw-threaded sleeve surrounding the drill-clamp, a similarly-threaded exterior sleeve adapted to move up and down thereon when the interior sleeve is turned, a guided yoke slidable upon the exterior sleeve and a spring by which it is normally pressed upward with relation to the sleeve, arms radiating from the inner sleeve, a spring-pressed lever, a plate to which said lever is fulcrumed so as to be moved in one direction by pressure and returned by the action of the spring and fastenings by which the plate is removably secured upon the brace.

5. In a boring and drilling tool of the character described, the screw-threaded sleeves, the spring-pressed guided yoke movable thereon and a flexible adjustable connection between the yoke and the article to be bored whereby the latter is held in contact with the

drill, radial arms projecting from the screw-threaded sleeve, a plate secured to the brace having outwardly-turned lugs at the lower edge, a lever fulcrumed to the plate and movable between the lugs which limit its motion so that the lever may be moved forward by pressure to engage the turning arms of the sleeve and rotate the latter, and a spring by which the lever is returned when pressure upon it is released.

6. The concentric screw-threaded sleeves surrounding the drill-clamp, a yoke slidable upon the outer sleeve, having connections with the part to be drilled, a spring or springs by which it is normally pressed upward, a pin projecting from the sleeve so as to hold the yoke against the spring-pressure, and a slot in the yoke through which the pin may slide when the yoke is turned to bring the slot and pin in line.

In witness whereof I have hereunto set my hand.

WILLIAM H. AMES.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.