C. M. KNOWLES.
Bit-Stock.

No. 205,400. Patented June 25, 1878.

Fig. 1.

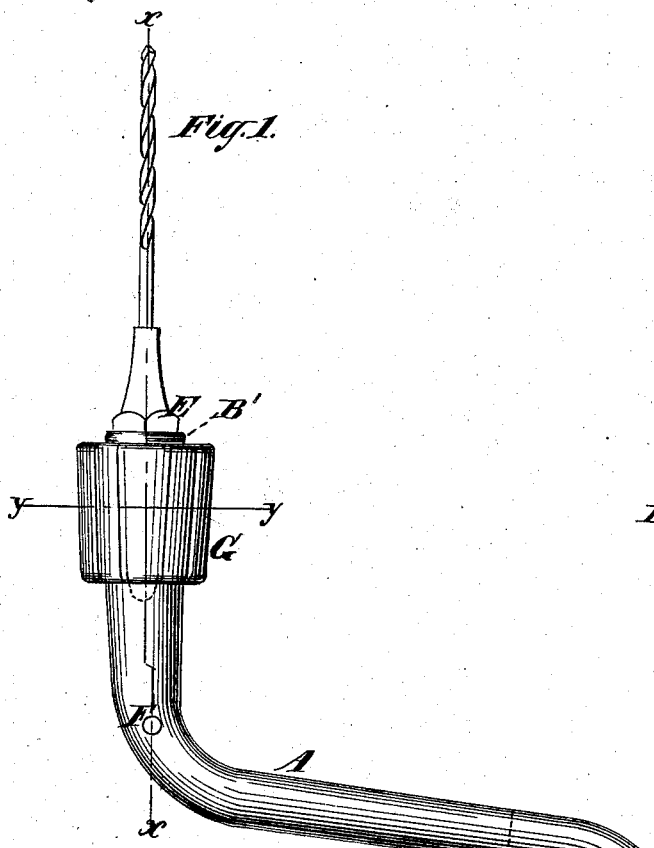


Fig. 3.

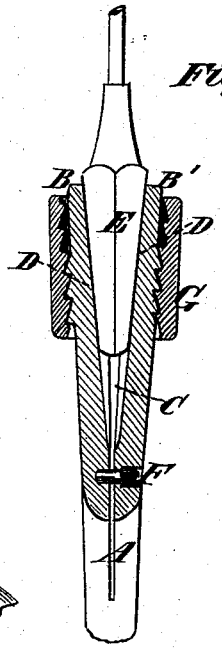
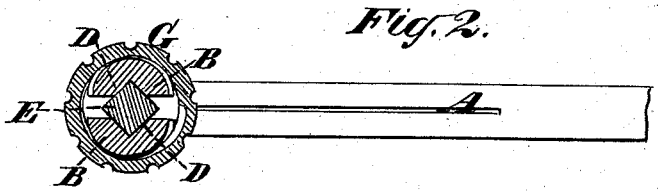


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES M. KNOWLES, OF NEW LONDON, CONNECTICUT.

IMPROVEMENT IN BIT-STOCKS.

Specification forming part of Letters Patent No. **205,400**, dated June 25, 1878; application filed April 23, 1878.

To all whom it may concern:

Be it known that I, CHARLES M. KNOWLES, of New London, in the county of New London and State of Connecticut, have invented an Improvement in Bit-Braces or Tool-Holders; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention consists in simple, cheap, and easily-manipulated means for fixing a bit or other tool in the socket for the same, the principal part of said invention being a novel screw-clamping device, whereby the bit or other tool may be clamped or released by a very slight action of the said screw-clamping device, and whereby the tool may, if accurately constructed, be placed and held uniformly in such manner that the axis of the said tool will be in the central and longitudinal axis of the socket in the bit-brace or tool-holder.

Figure 1 in the drawings is a side view of a bit-brace constructed according to my invention. Fig. 2 is a cross section on the line *y y* in Fig. 1. Fig. 3 is a section on the line *x x* in Fig. 1.

A represents a portion of the socket end of the brace, upon which is formed a socket, B B′, for the reception of the bit or other tool to be held, as hereinafter described. The said socket B B′ is formed in two parts by means of a cleft or split, C, which divides the said socket longitudinally, and which extends into the lower part or socket end of the brace to a distance sufficient to allow the two parts of the said socket to spread apart when a separating force is applied to them with neither too much nor too little effort. The length of the said cleft may be varied according to the size of the brace and the taste of the manufacturer. The longer it is the easier the parts B B′ of the socket may be separated, and vice versa.

Each of the said parts B B′ of the socket have cut therein a tapered angular recess, D, which extends the whole length of said socket, and also extends to a considerable distance into the socket end of the brace beyond the said socket. Those portions of said recesses which are within the said socket serve to engage the angular part E of the bit or other tool to be held.

At or near the first bend in the said brace A is inserted, in one or the other of the parts B B′, or the continuation of the same which forms the socket end of the brace, a steadying-pin or guide-pin, F. The said pin F is firmly fastened in the part into which it is inserted, and its inner end extends to and into the continuation of the recess D in the opposite part of the brace to that in which it is inserted. The function of the said pin is to hold the two parts B B′ of the socket in proper mutual relation, and compel the said socket to accurately center the bit or tool when the same is clamped in said socket.

Upon the outside of the parts B B′ of the socket is cut a screw-thread, having a form hereinafter described, in such manner that if the said socket were solid, instead of being split, the said thread would be continuous. The separation of the parts B B′ gives to the exterior of the socket B B′ a form more or less tapering, according to the extent to which the said parts are separated, the larger part of the socket being at the extremity of the brace, or directed in the same way as the working end of the tool when clamped in said socket.

Upon the male-threaded tapering socket is fitted a female-threaded screw-ferrule, having its thread formed to correspond with that of the thread on said socket, and having at the larger end an interior diameter equal to or somewhat greater than the maximum distance the outsides of the parts B B′ will be separated when the largest tool they are designed to hold is inserted between them. Said ferrule is also a tapering ferrule, its lesser interior diameter being of the proper measurement to compress the parts B B′ when the smallest-sized tool the brace is designed to hold is clamped therein.

The form of the male thread on the said socket has the same cross-section reversed in position as that of the female screw in the said ferrule, and is as follows: One side of the cross-section of the thread is nearly or quite at a right angle with the axis of the screw and the other side of the said section is at an acute angle with the said axis. This construc-

tion of the thread on a tapering or conical surface causes the male and female threads not only to present broad bearing-surfaces to each other, but renders the compressing or releasing action of the ferrule upon the split socket B B′ much more rapid than would be the case with the ordinary V-shaped thread or a square thread. The action is also accelerated by the peculiar method of applying the said ferrule to the said socket, which, as will be seen, is the reverse of that ordinarily employed with split sockets of tool-holders, in which the small end of the tapered socket is directed in the same way as the point of the tool to be held when the said tool is placed in the socket. In my invention the larger end of the split socket is directed in the same way as the point of the tool when the latter is placed in the socket to be held therein.

By this arrangement I am able to produce a bit-brace or tool-holder having a split socket and a screw-ferrule for compressing the parts of the socket for clamping the tool to be held, in which a less turning of the screw will clamp or unclamp the tool or will open or close the parts of the socket than in any other bit-brace or tool-holder with which I am acquainted.

I claim—

1. The screw-threaded split socket having a tapering interior and exterior, and constructed with its large end extending toward the tool when inserted therein, in combination with the tapered screw-ferrule, constructed and arranged with its larger end extending toward the working end of the tool when inserted, substantially as shown and described.

2. The combination, with the parts B B′ of a tapered split tool-socket of a bit-brace or tool-holder, of a male screw-thread formed thereon with one side of the thread nearly at right angles with the axis of the screw and the other side of the thread formed at an acute angle with the said axis, a ferrule, G, having a female screw-thread corresponding with the male thread on the socket, and applied to the said socket to screw toward the point of the tool for clamping the latter in the said socket, substantially as and for the purpose specified.

3. The combination, with the split socket B B′ and the ferrule G, of the guide or steadying pin F, inserted in one part of the split socket or an extension of the same, and having its inner end extended into the recess D in the opposite part, substantially and for the purpose set forth.

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Witnesses:

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