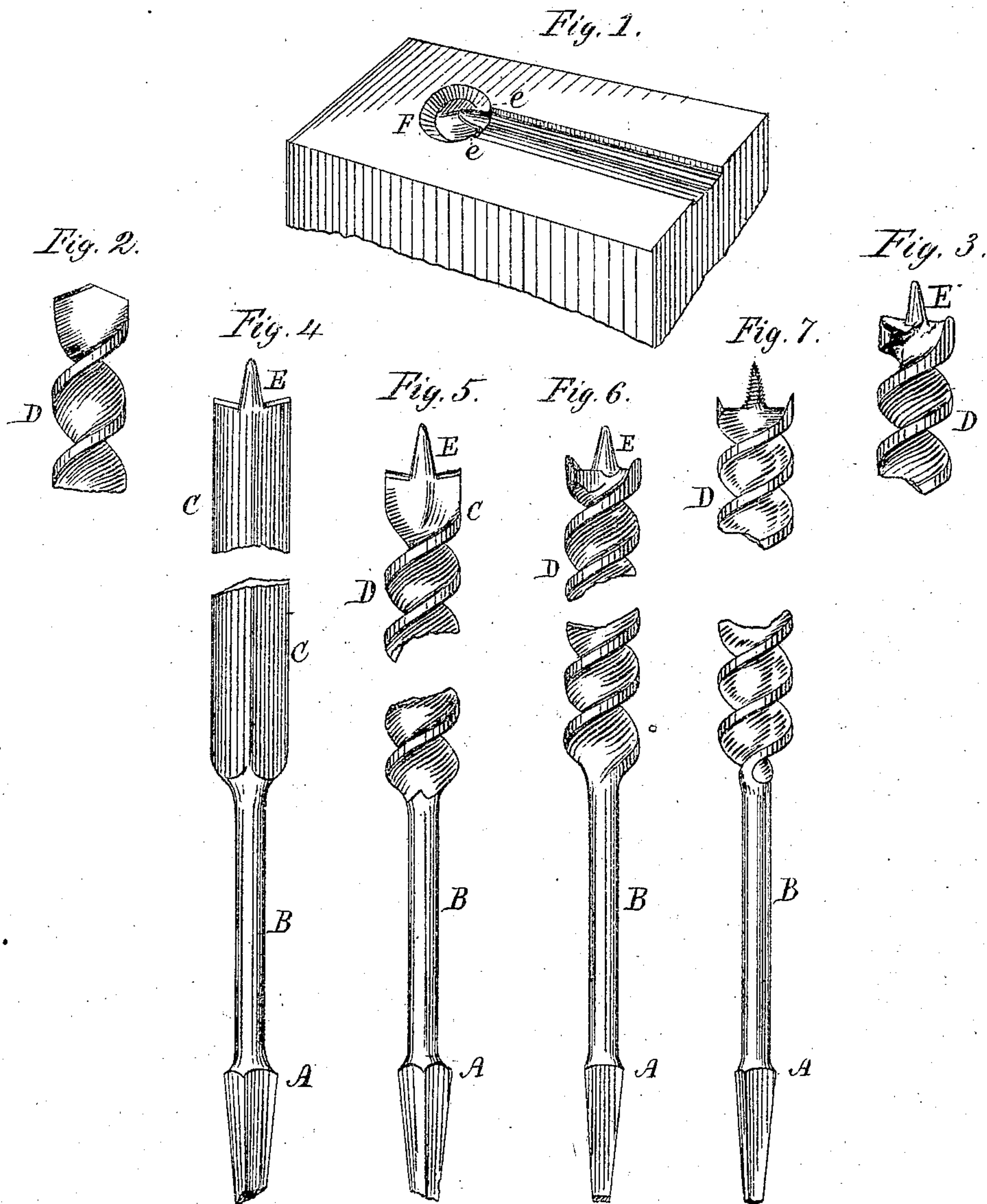


S. A. SMITH.

Dies for Manufacturing Augers.

No. 136,391.

Patented March 4, 1873.



WITNESSES.

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SAMUEL A. SMITH, OF ESSEX, CONNECTICUT.

## IMPROVEMENT IN DIES FOR MANUFACTURING AUGERS.

Specification forming part of Letters Patent No. 136,391, dated March 4, 1873.

*To all whom it may concern:*

Be it known that I, SAMUEL A. SMITH, of Essex, county of Middlesex and State of Connecticut, have invented certain Improvements in Dies for Making Boring-Bits, of which the following is a specification:

This invention relates to the formation of the guiding-screw or centering point or tip of boring-bits; and consists in the use of a peculiarly-shaped die for forming the blanks of said centering-points, from which the guiding-screws are afterward made.

Figure 1 represents a view in perspective of one-half of the die. Fig. 2 represents a portion of a blank partially formed, but without any screw-tip. Fig. 3 shows the same after the tip has been formed by the common method of forging. Fig. 4 represents a blank having a screw-tip formed according to my invention. Figs. 5, 6, and 7 represent the appearance of the blanks through the different steps of progress to the finished article.

To illustrate the advantages of this invention, it may here be stated that the common method of forming boring-bits is to select a square bar of steel, the cross-section of which is about the size of the largest portion of the shank, as at A, Figs. 4, 5, 6, and 7. The round portion of the shank, as at B, is then formed by forging in any convenient manner, and another portion of the bar is then flattened, or nearly so, as at C, Fig. 4, to an extent sufficient to form the "chip-screw," shown at D, Figs. 2, 3, 5, 6, and 7.

The next operation is to form the tip, as at E, for the centering and guiding screw of the bit; and heretofore it has been accomplished in two ways—viz., by hand and by dies, which latter leaves a fin or roughened edge that has to be cut away; and when formed by hand it is done by heating the end of the blank after it has been shaped, as shown at Fig. 2, and placing it on a corner of an anvil or "hardy" and skillfully forging it out by a series of blows under the hammer until it assumes about the shape shown at Fig. 3.

This operation requires considerable skill, often resulting in the loss of the blank, and always so upsets the metal about the end of the blank that much labor is wasted in finishing the bit.

These objections are completely avoided by using a die, one-half of which is shown in perspective at Fig. 1, and may represent the an-

vil upon which the blank is to rest in forming the screw-tip.

An exact counterpart of Fig. 1 may be used as a "hardy" or setting-tool, but it is preferable to connect it with a drop hammer or press in such a manner that when the faces of the two halves are brought together a recess will be formed to exactly receive the tip end of the blank, shown at Fig. 4. In other words, each half of the die is recessed to conform to the flattened portion of the blank and to the exterior of the screw-tip, but with cutting-edges around the tip, and at its base, as at *e*, for the purpose of removing all unnecessary metal, thereby leaving the blank with the screw-tip all nicely formed, as shown at E, Fig. 4, and by the one operation of closing the die upon said blank.

The circular recess in the die, as shown at F, Fig. 1, is merely a space for receiving the scrap pieces and scale that are severed from the blank and around the screw-tip. The metal of the die that is around said recess F serves to strengthen the cutting-edges at *e* of the die around the tip, or otherwise the die might be scarfed or chamfered off from around said edges, and in such a case the scrap would fall outside and away from the machine.

The screw-tip being formed, as has already been stated, by one blow or squeeze between the two halves of the die, prepares the blank for being twisted, as shown at Fig. 5, to form the chip-screw, after which its tip end is reheated and then inserted in another die, or a hole in a block of metal having recesses corresponding to the screw-tip and the spurs, shown at *g g*, Fig. 6, where by one blow of a hammer upon the end of the shank at A, the blank is finished ready for polishing and receiving the screw-thread on the guiding or centering tip.

I am aware that the use of dies for forming the screw tips or points and cutting-lips of augers and boring-bits is not new, and I do not therefore claim broadly the use of dies for that purpose; but

I do claim as my improvement—

In such dies the sharp cutting-projections E, for cutting the metal entirely from around the screw-point together with the recess F, all as and for the purposes set forth.

Witnesses: SAMUEL A. SMITH.

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