(No Model.)

J. SWAN.

DIE FOR MAKING BITS.

No. 422,546. Patented Mar. 4, 1890.

Fig. 1.

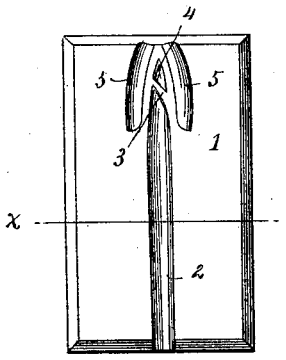

Fig. 2.

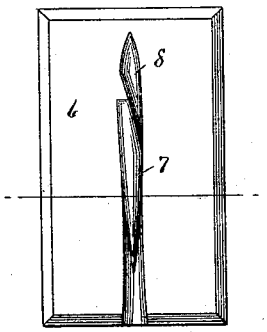

Fig. 3.

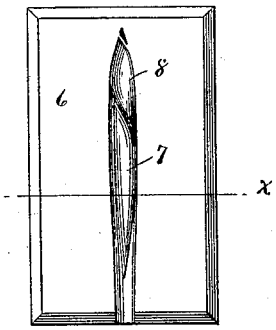

Fig. 4.

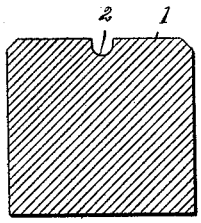

Fig. 5.

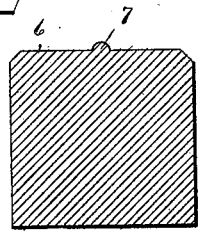

Fig. 6.

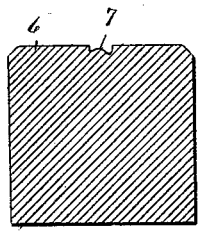

Fig. 7.

Fig. 8.

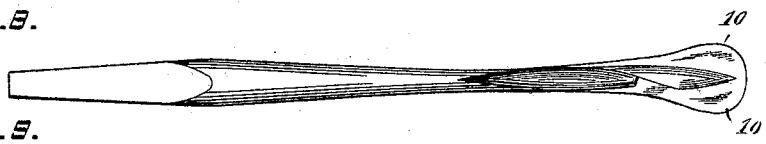

Fig. 9.

Fig. 10.

Fig. 9.a

WITNESSES

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UNITED STATES PATENT OFFICE.

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DIE FOR MAKING BITS.

SPECIFICATION forming part of Letters Patent No. 422,546, dated March 4, 1890.

Application filed December 4, 1889. Serial No. 332,519. (No model.)

To all whom it may concern:

Be it known that I, JAMES SWAN, a citizen of the United States, residing at Seymour, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Dies for Making Twist-Bits; 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.

My invention has for its object the production of dies which will perfectly form the class of bits variously known as "gimlet," "twist," and "German" bits—that is, a class of bits having a single deep groove which makes a spiral turn at the lower end of the pod. Heretofore, after the bit-blank has been forged, a single straight groove has been formed at the lower end of the pod by a drop-hammer. After forming the groove the pod has required to be twisted to give proper shape to the bit.

My invention enables me to greatly lessen the cost of production without affecting the quality of the bit in the slightest by dispensing with several operations in the process of manufacture that have heretofore been indispensable—for example, the formation of a straight groove after the blank has been swaged, and then the twisting of the bit. The use of my novel die enables me to form the bit with its spiral groove complete at a single operation from a rough blank.

I have found in actual practice that the result of using my novel die has been to reduce the cost of production to about one-fifth of what it is by the old method.

In use the upper die is carried by a power hammer or drop, in the usual manner, and the lower die is supported upon a suitable block. The dies may be reversed, if preferred.

As the hammer or drop used and the manner in which the lower die is supported have nothing to do with my present invention, they have been wholly omitted from the drawings.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a lower die, and Fig. 2 an inverted plan view of an upper die, by which my invention is carried into effect. Fig. 3 is an inverted plan view of an upper die, which accomplishes the same result as the die in Fig. 2, but in which the entire operative portion of the die is below the surface of the block, instead of partially projecting above it, as in Fig. 2. It should be understood that the form of lower die illustrated in Fig. 1 corresponds with the form of upper die illustrated in Fig. 2, and that to correspond with the upper die illustrated in Fig. 3 the lower die would be the same as in Fig. 1, except not cut so deeply into the block. Figs. 4, 5, and 6 are respectively cross-sections on the line *x x* in Figs. 1, 2, and 3; Fig. 7, a view of the blank as it comes from the drawing-dies ready to be operated upon; Fig. 8, a view of the blank after the operation of my novel dies; Fig. 9, a view after the surplus metal pressed out at the sides of the pod by the die has been removed; Fig. 9ª, a view of the opposite side of the blank to that shown in Fig. 9 after the surplus metal has been removed, and Fig. 10 a view of a completed bit of this class.

1 denotes the block of the lower die, which is provided with a groove 2, in which the body of the pod is formed, a diagonal rib 3, which lies flush, or nearly so, with the surface of the block, and a depression 4, in which the point of one side of the pod is formed. This depression is so shaped as to give to the end of the pod substantially the form required, so that but very little metal has to be removed in finishing the bit. The upper end of the depression tapers upward and outward to the surface of the block, the lower end being the diagonal line of rib 3.

5 denotes grooves in the top of the block outside of the grooves which form the pod, into which the surplus metal of the blank is forced when the pod is formed.

6 denotes the block of the upper die, which is provided with a rounded rib 7, by which the main portion of the groove in the pod is formed. The lower portion of this rib terminates in a tapering point which corresponds with the running out of the groove in the pod—that is to say, the rib upon the upper die is so formed that the groove in the pod formed thereby will gradually run out at the upper end of the pod.

As already stated, and as illustrated in Figs.

2 and 3, this rib to form the groove may rise from the bottom of a groove in the block, as in Figs. 3 and 6, or may rise from the surface of the block, as in Figs. 2 and 5, the latter form being deemed preferable in use. Below rib 7—that is, at the portion of the die that forms the lower end of the bit—is a depression 8, in which the side of the pod opposite to that formed in depression 4 is formed.

In practice depression 8 is made substantially the same shape as depression 4, but considerably larger. The upper end of depression 8 tapers and runs upward and outward to the surface of the block, the same as the corresponding depression in the other block. The lower end of this depression is a diagonal line, which is also the upper line of rib 7. In the form of upper die illustrated in Fig. 2—that is, a form in which rib 7 rises from the surface of the block instead of from the bottom of a groove in said block—the tapering upper end of said rib is preferably removed, as is clearly shown.

In swaging the blanks to form this class of bits they are preferably left substantially in the form illustrated in Fig. 7.

The drawing of the blanks is accomplished in two sizes of grooves. At the second drawing the outer end of the blank is not drawn entirely through, so as to leave an enlargement, which I have denoted by 9, at the outer end of the blank.

To form a bit, the operator simply inserts the blank between the upper and lower dies and gives it one or more blows, as may be required. This leaves the blank substantially as shown in Fig. 8. The scales of surplus metal, which I have denoted by 10 and which are formed in grooves 5, are then trimmed away, leaving the blank substantially as shown in Figs. 9 and 9^a.

It will be seen from Figs. 9, 9^a, and 10 that the groove shown in Fig. 9^a, and which is formed by the diagonal rib 3 in Fig. 1, forms in the completed bit—that is, after the usual hand-finishing with a file—a continuation of the groove shown in Fig. 9, and which is formed by rib 7 in Fig. 2. In fact, after the scale of surplus metal shown in Fig. 8 is removed, the finishing of the bits, while necessarily performed by hand, is accomplished with great rapidity.

Having thus described my invention, I claim—

A pair of dies for making bits, consisting of a member having a groove 2, a diagonal rib 3, and a depression 4, and another member having a rounded rib 7 and a depression 8, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES SWAN.

Witnesses:
GUSTAV E. TIEDEMANN,
HENRY C. SCHNEIDER.