





## UNITED STATES PATENT OFFICE

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MANUFACTURE OF BITS FOR MINING  
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1 Claim. (Cl. 76—108)

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This invention relates generally to mining drills, and bits therefor.

In United States patent to Stogsdill, No. 2,372,612, and United States patent to Phipps, No. 2,341,237, there is disclosed a bit of generally Y-shape, adapted particularly for use in connection with augers in the mining of coal and other minerals. In such Stogsdill and Phipps patents, the Y-bit was formed from a long strip of stock, bent double to provide a shank from which the two arms of the Y extended in opposite directions. Experience in the field with bits of the character shown in said patents demonstrated that the shank portion of such a bit was inherently weak, apparently due to the stresses set up therein in deforming the same. The incidence of breakage of the shank portions of such bits was found to be too high for practical and commercial consideration. An effort to overcome the inherent weakness of such Y-bits is disclosed in the co-pending application of James M. Patterson, Serial No. 633,633, filed December 8, 1945. In said Patterson application, Y-shaped stampings were cut from a strip of stock, so that the shank portion of the bit was unitary. The arms of the Y-shaped stamping were then deformed and sharpened, so as to provide a bit of the same general configuration as that shown by the aforesaid Stogsdill and Phipps patents. The bit of the Patterson application, while representing a substantial improvement over the previous art, was costly to manufacture because of the great waste of stock involved in stamping out the blanks, and as a bit was deficient in mining operations upon hard minerals because a cylindrical core arose between the prongs of the bit, and was not disintegrated at the bifurcation with the uniformity desirable in mining operations.

The object of the present invention, generally stated, is to provide a more economical process of manufacturing Y-bits, and to provide a bit which will disintegrate the central core in a borehole without being subject to a high degree of breakage. Other objects will become apparent to those skilled in the art when the following description is read in connection with the accompanying drawings, in which:

Figure 1 is a perspective view of the strip of bit stock from which the bits of the present invention are blanked;

Figure 2 is a perspective view of an individual blank, cut from the strip shown in Figure 1, and showing in dotted lines the manner in which the prongs of the Y are diverged from the blank;

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Figures 3, 4, and 5 are, respectively, end, front, and side elevations of the blank after the first step of deformation, as shown in dotted lines in Figure 2;

Figures 5, 6, and 7 are, respectively, end, front, and side elevations of the bit blank after a further step of deformation; and

Figure 9 is a perspective view of the completed bit.

The present invention contemplates the manufacture of Y-bits from a strip of bit stock whose cross-sectional dimension is the same as the cross-sectional dimension of the shank of the finished Y-bit. After a blank is cut from such a strip of stock, it is centrally slit for part of its length, and the slit portions then spread apart to form a Y-shaped blank, the spreading being preferably in the plane of the slit. The prongs thus formed are then further deformed and sharpened to provide the desired cutting edges. As a result of the slitting operation and the initial spreading of the prongs in the plane of the slit, right angular cutting edges are provided at the bight between the prongs, which effectively disintegrate the central core in the borehole.

In the manufacture of bits in accordance with the present invention, a strip of steel stock 1, whose cross-sectional dimension corresponds to that desired for the shank portion of the Y-bit to be manufactured, is provided and a succession of blanks 2 is stamped from the strip 1. The blanks 2 have one end tapered, as shown at 3, and the opposite end rounded, as shown at 4. Concentric with the rounded end 4 is a hole 5. Accordingly, in stamping the blanks from the strip 1, the only waste is represented by the two opposite chips 6 adjacent the tapered and rounded portions, and the core from hole 5.

The blank 2 is then slit lengthwise along line 7, shown in Figure 2, which is the longitudinal central axis of the bit. The slitting may be accomplished with a suitable shear, and terminates substantially short of the end of the blank where-in hole 5 is provided.

Having thus slit the blank, the portions thereof which are separated by the slit are bent in opposite directions, as shown in Figure 2, to form prongs 8 and 9. In thus bending the slit blank, it is preferable that the faces of the prongs 8 and 9, which were formed in the slitting operation, be maintained substantially parallel. After the prongs are thus bent, the blank is in the form shown in Figures 3, 4, and 5.

The Y-shaped blank is then further deformed by bending the prongs 8 and 9 about the longi-



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tudinal axis of the unslit, or shank, portion, i. e. athwart the direction in which the prongs 8 and 9 diverge from the unslit portion, as shown in Figures 6, 7, and 8. As shown, the direction of the latter bending is preferably such as to tend to close, rather than to further open, the slit 7. Thereafter the tips 10 and 11 of the arms 8 and 9 are sharpened by grinding, to provide cutting edges at the extremities of the prong, and at the face which was formed by the slitting operation. The completed bit is shown in Figure 9, and consists of the prongs 8 and 9, having tips 10 and 11, the said prongs being integrally connected with the unitary shank 12, which latter is adapted to be received in the head of an auger.

From the foregoing description, those skilled in the art should readily understand the process of manufacturing the Y-bit in accordance with the present invention, and should realize that the edges 13 and 14, formed by the slitting operation adjacent the bight, constitute cutting surfaces for disintegrating any central core left standing in the hole.

While one embodiment of the invention has been described in detail, it is not to be understood that the invention is limited precisely thereto.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

In the manufacture of V-shaped bits wherein two prongs diverge from their root with a shank of substantially rectangular cross-section to a distance substantially radially outward from said shank, the method comprising, providing a strip of bit stock having a cross-section corresponding to that of the shank of the bit to be made, cutting

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blanks from said stock of a length corresponding to that of one prong plus that of the shank, slitting the blank along its longitudinal central axis for a distance from one end corresponding to the length of a prong to provide two equisized parallel prong parts coextensive with the slit, said prong parts having free ends at said one end of the blank and having their opposite ends making root with a shank part beyond the slit, spreading the free ends of said prong parts apart until said prong parts are in substantially right-angular relationship with each other on the plane of said slit, and then turning the free ends of said prong parts oppositely across the plane of slitting so that the free end of each prong is on the opposite side of said plane from the root thereof.

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