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MINE MACHINERY CUTTING BIT AND MOUNTING THEREFOR

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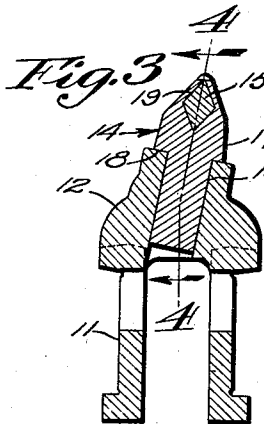
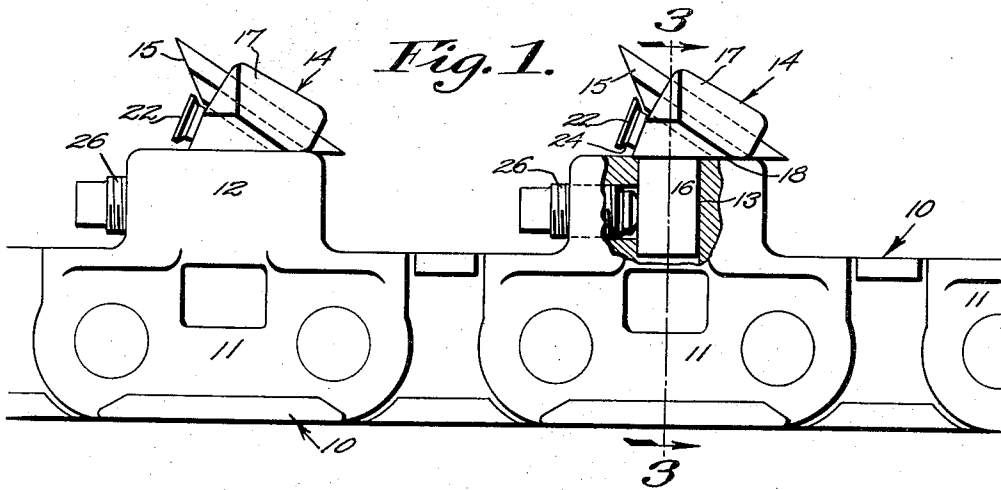
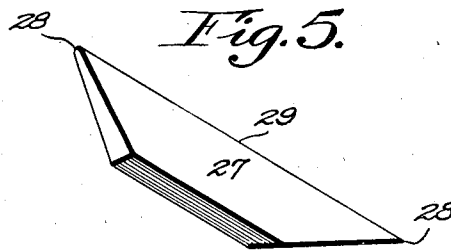
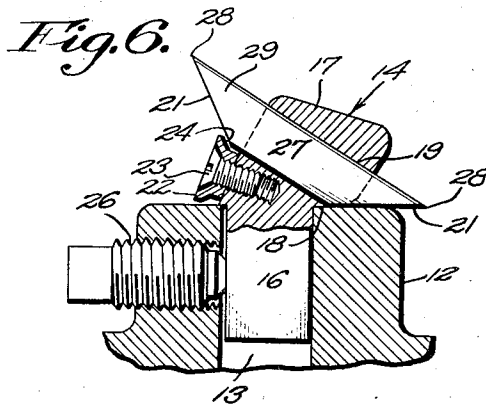
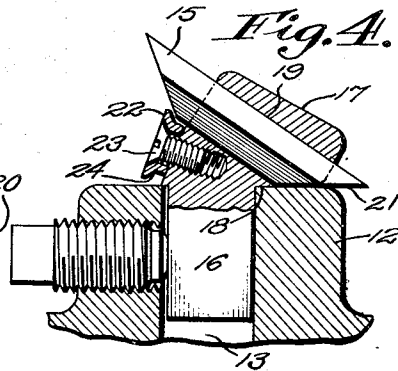
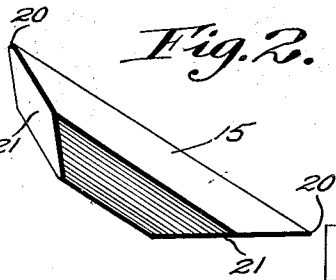


Fig. 2.



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MINE MACHINERY CUTTING BIT AND
MOUNTING THEREFOR

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1 Claim. (Cl. 262—33)

This invention relates to mining machinery and is particularly directed to improvements in cutter bits or teeth and the means for mounting the same in mining machine chains. The type of mining machinery to which these teeth are applied uses an endless chain carrying teeth angularly laterally disposed for making a cut through the coal. The angle of mounting of the teeth is varied in transverse planes, whereby the successive teeth make a cut which is sufficiently wide enough to admit the run of chain and its guide. The present invention being primarily directed to the construction of the teeth or bits and to the mounting thereof, it is only necessary for the purpose of clearly describing and illustrating the same that reference be made to one chain block or link of the cutter chain. Each of these tooth carrying blocks or lugs, as they may be termed, include sockets which are transverse to the longitudinal extent of the chain.

It is well recognized that the average cutter tooth or bit is subjected to extremely hard usage and constant replacement is necessary. To this end it is desirable that the teeth be reversible, that is, that both ends thereof are cutting ends. Moreover, it is desirable to have the teeth easily insertable and that the mode of mounting be extremely simple so that replacement under difficulties such as in a dark mine and in close quarters is facilitated. Furthermore, due to the rapidity with which the cutter teeth are damaged or worn out in the rough service to which they are subjected, it is necessary for the economical operation of the machinery that the teeth be of a form easy to manufacture. Because of the character of material which the bits are designed to cut, it is also necessary that the mounting be highly effective for properly receiving the thrusts imposed by the work.

Therefore, it is an object of this invention to provide an improved reversible bit or tooth for use in a mining machine chain which is economically cut from bar stock to provide obliquely cut surfaces disposed at the proper angles at the ends of the cutter bit or tooth for efficient mounting and reversal in the chain block.

It is a further object of this invention to provide an improved bit or tooth, holder, and chain block combination, wherein the bit or tooth has its inner cutting end which is not in use solidly supported on the chain block for resisting the heavy thrusts imposed on the tooth in the operation of the chain and distributing the working forces in such manner that breakage of the holder and bit is reduced to a minimum.

It is a still further object of this invention to provide an improved mounting and cutter bit construction, whereby the bits are conveniently replaced or reversed and wherein outward displacement of the bits is prevented.

It is a still further object of this invention to provide an improved cutter bit mounting adapted to be placed in a mining machine chain which is of integral structure and formed for efficient attachment to the chain and for efficiently supporting the cutter bit.

Other objects and further advantages will be more fully apparent from a description of the accompanying drawing, in which:

Figure 1 is a side view of a length of mining machine chain incorporating the improved cutter teeth and mounting of the present improvements.

Figure 2 is a perspective view of the improved cutter tooth.

Figure 3 is a sectional view taken on line 3—3, Figure 1, showing the holder and cutter in transverse section.

Figure 4 is a sectional view taken on line 4—4, Figure 3, further illustrating the mounting of the cutter tooth and displaying its relation to the cutter block.

Figure 5 is a perspective view showing a modified form of cutter tooth.

Figure 6 is a sectional view taken similar to Figure 4, but showing the modified bit in position of use and solidly supported on the cutter chain block.

As stated, the carrier for the cutter teeth may be of any conventional character and therefore is shown in the form of an endless chain, which is properly guided and driven by power (not shown). Alternate links of the chain, referred to as blocks or lugs provide lateral extensions including sockets for the cutter teeth or bits. These lateral extensions and sockets regarded successively in the length of chain have their angles varied in the transverse planes in which they are disposed. That is to say, when the length of chain is regarded in transverse section or in end view, the teeth holding sockets at the different angles dispose the teeth so that they spread out fan-like over a sufficient distance to make a cut which is of greater width than the thickness of the chain so that as the chain moves into the cut in the coal, free passage thereof is always possible.

A tool or bit holder is generally indicated at 14 and the bit or tooth at 15. The holder includes a shank adapted to be disposed in the

socket 13 of the chain lug or block and a head 17 resting upon the top of the block. The head is of considerable mass and provides a wide shoulder 18 resting on the block.

5 The bit receiving socket opening of the holder is in the form of a passageway or socket 19 extending obliquely forwardly relative to the longitudinal extent of the chain or block. The opening 19 is shaped transversely to fit the cross
10 section of the tool or cutter bit. The cutter bit in this instance is of diamond shape in cross section with the greater width of the diamond shape disposed outwardly of the length of chain.

This bit is formed from bar stock of the particular shape. The bar stock is cut up in short
15 lengths to form the teeth. The cuts are made obliquely and adjacent cuts are opposingly obliquely related so that the tips 20 of each tooth are at the same side thereof. It is provided that
20 the angle at the ends of the teeth is at a degree which would cause the particular inner or supported end surface 21 shown of the tooth not in use to rest flush on the top surface of the block at the inner end of the tooth receiving socket,
25 the outer end of the tooth protruding at this time a sufficient distance to provide ample clearance for cutting purposes.

A means is provided for preventing outward displacement of the bit when placed in the holder,
30 this means being in the form of a button 22 on the front of the holder from which the bit protrudes, this button being held in position by means of a screw 23 and including an inwardly tapered head 24 after the manner of a counter-
35 sunk screw head and is related to the extended end of the body so as to be adjacent to the lower end portion 21 of the oblique face of the tooth, a very slight clearance being maintained for working purposes. It will be apparent that this
40 bit can be readily reversed and that either end can be solidly supported on the chain block.

The bits are insertable from the rear end or shoulder side of the head and therefore it is not

necessary to disturb the means for preventing displacement. The holder is held in position by means of a screw 26 extended through the block and engaging the shank, it being readily possible to loosen the screw and remove the holder
5 for insertion of the tooth through the rear side of the head, the rigid mounting of the head in the block when in use thereafter preventing dislodgement of the tooth inwardly.

In the modified views, a triangular shape tooth
10 27 is shown. This bit is also formed of bar stock and the cuts are made opposingly obliquely as previously described. In this instance it is provided that the long extent of the tooth including the cutting points 28 is at the apex 29 of the tri-
15 angular shaped material.

The means or stop which is provided for preventing outward displacement of the bit when placed in the block may be integral with the block. However, the removable abutment or but-
20 ton 22 has the advantage that it is possible to remove the bit outwardly without removing the holder from the block, for instance, in cases where the end of the tooth has been badly damaged or bent in use and the tooth cannot be with-
25 drawn from the socket by way of the rear end thereof.

Having described our invention, we claim:

A device of the class described for use in a mining machine apparatus, a cutter bit holder
30 including an attaching shank and a head, said head having an obliquely extended bit receiving opening therethrough and adapted to carry a cutter bit in said obliquely extended opening, with the lower end of the bit extended entirely
35 through the lower end of the obliquely disposed opening, and an adjustable abutment on the head of said cutter bit holder engageable with the upper outer end of the bit for preventing upward movement of the bit.

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