

Nov. 25, 1941.

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2,263,589

CUTTER CHAIN

Filed March 15, 1935

2 Sheets-Sheet 1

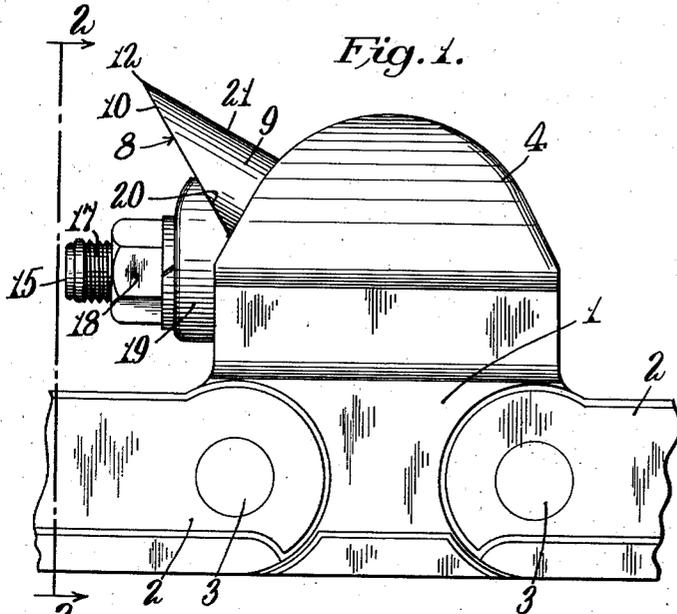


Fig. 1.

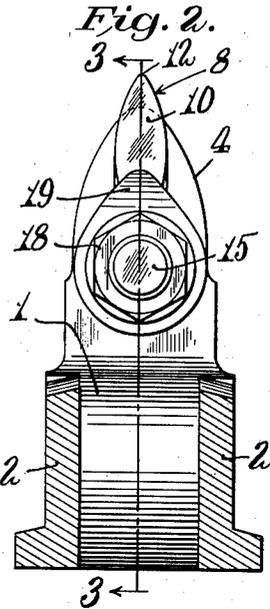


Fig. 2.

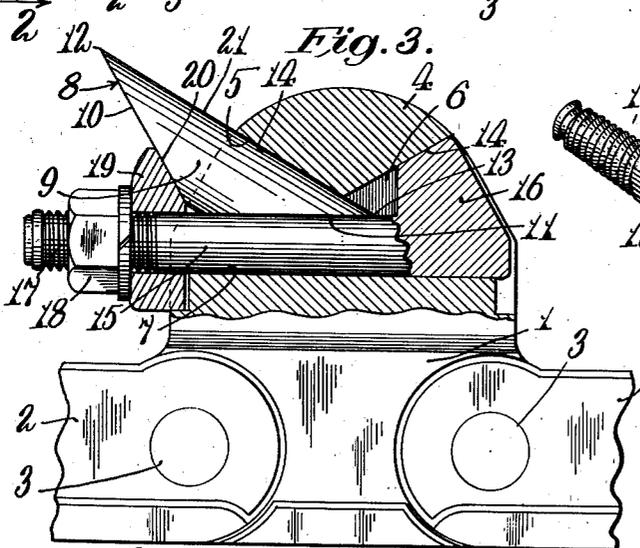


Fig. 3.

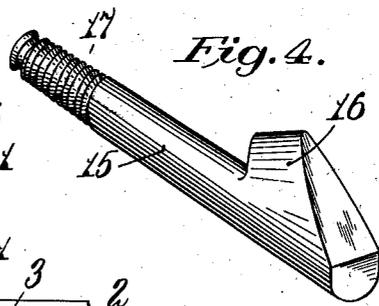


Fig. 4.

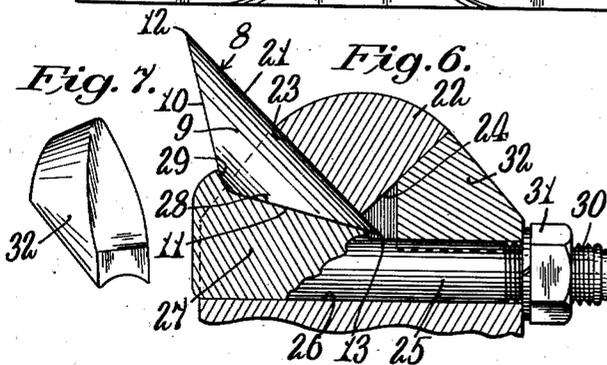


Fig. 6.

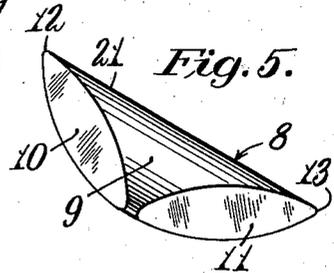


Fig. 5.



Fig. 7.

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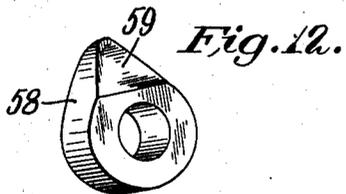
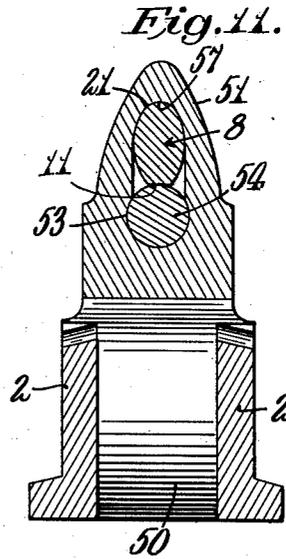
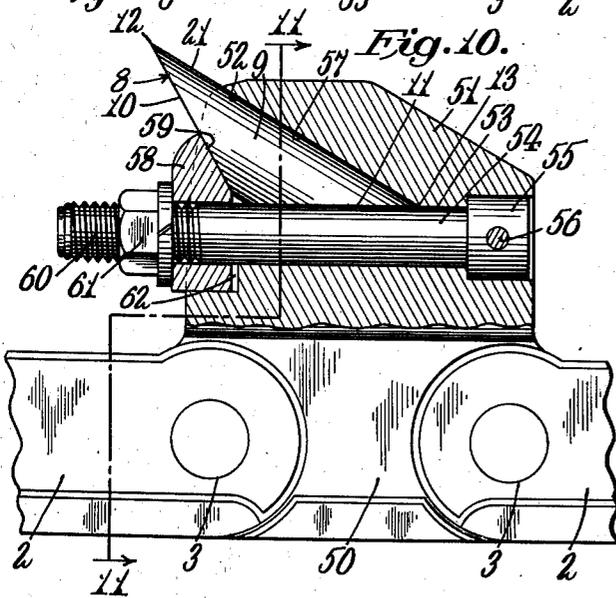
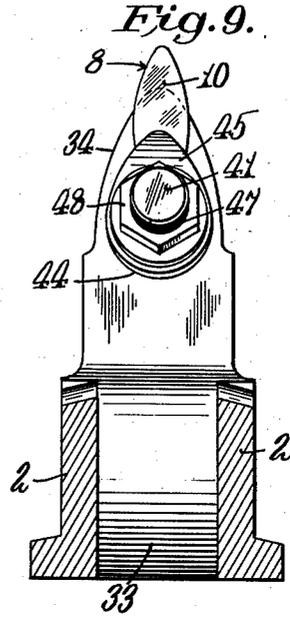
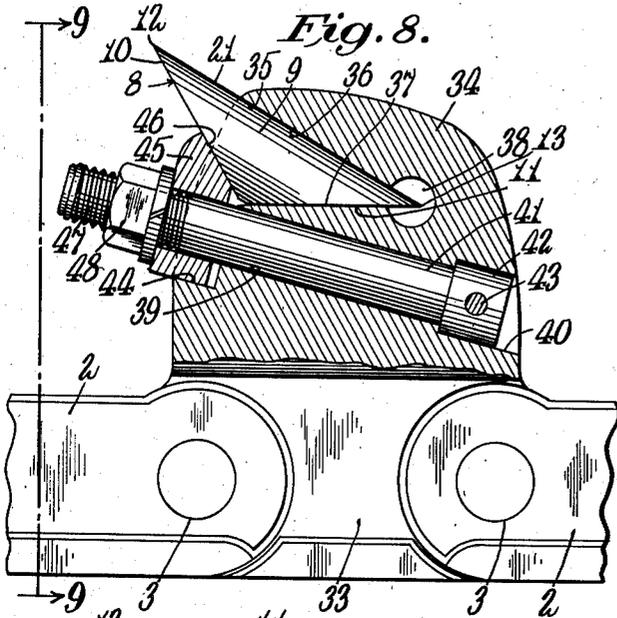
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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CUTTER CHAIN

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Application March 15, 1935, Serial No. 11,310

5 Claims. (Cl. 262-33)

This invention relates to cutter chains and more particularly to improvements in cutter chains particularly adapted for mining purposes.

An object of this invention is to provide an improved cutter chain having embodied therein improved means for holding the cutter bit in cutting position within the bit block. Another object is to provide an improved cutter bit. Yet another object is to provide improved supporting means for a cutter bit of the double pointed, reversible type. A further object is to provide an improved cutter chain of the reversible type having improved supporting means for the cutter bit for supporting the latter in reversely located cutting positions with respect to said supporting means, and having embodied therein improved means for securely holding the bit in either cutting position. These and other objects of the invention will, however, hereinafter more fully appear.

In the accompanying drawings there are shown for purposes of illustration several forms which the invention may assume in practice.

In these drawings—

Fig. 1 is a side elevational view of one illustrative embodiment of the improved cutter chain,

Fig. 2 is a cross sectional view taken on line 2-2 of Fig. 1 showing the cutter bit and bit block in end elevation,

Fig. 3 is a longitudinal section taken substantially on line 3-3 of Fig. 2, with parts shown in side elevation,

Fig. 4 is a perspective view of the holding bolt,

Fig. 5 is a perspective view of the cutter bit,

Fig. 6 is a fragmentary view similar to Fig. 3 showing a modified form of construction,

Fig. 7 is a perspective view of the wedge block shown in Fig. 6,

Fig. 8 is a view similar to Fig. 3 showing a further modified form of construction,

Fig. 9 is a cross sectional view taken substantially on line 9-9 of Fig. 8 showing the cutter bit and bit block in end elevation,

Fig. 10 is a view similar to Fig. 3 showing still another modified form of construction,

Fig. 11 is a cross sectional view taken on line 11-11 of Fig. 10,

Fig. 12 is a perspective view of the adjustable clamping block shown in Fig. 10.

In the illustrative embodiment of the invention shown in Figs. 1 to 5 inclusive, a bit block is indicated at 1 and strap links at 2, the latter being pivotally connected to the bit block by usual pivot pins 3. The bit block 1 is of a sym-

metrical shape, having a lateral lug 4 formed with oppositely disposed sockets 5 and 6 of identical shape, opening respectively through the opposite end faces of the block as shown in Fig. 3, and communicating at their inner sides with a longitudinal bore 7.

The cutter bit generally designated 8, as most clearly shown in Figs. 3 and 5, comprises a body 9 of elliptical cross section and substantially in the form of an obtuse-angled isosceles triangle in side elevation, having plane cutting faces 10 and 11 formed at its equal sides, terminating in cutting points 12 and 13 formed at the angles opposite its equal sides, at the same side of the bit. The bit may be advantageously formed by cutting from elliptical shaped bar stock, forming the cutting faces by cutting the stock diagonally, and making successive diagonal cuts complete a bit by turning over the bar stock between each cut and the next one. By selecting bar stock of symmetrical form with regards to axes at right angles to each other, the cutting faces will necessarily be the same, if the angle of the cutter to the bar stock be maintained the same. After being formed, the bit will be hardened and tempered as may be desired, and will require no individual sharpening if suitable bar stock be employed. The finished bit has its points 12 and 13 at its opposite ends and at the extremities of cutting faces of elongated elliptical shape which are alike in outline. The cutting faces are in planes forming a dihedral angle whose edge, in the construction shown, falls outside the opposite lateral extremity of the bit; and said faces are individually symmetrical as to both major and minor axial lines. Obviously substantial variation between a truly triangular shape in side elevation and that of an elongated trapezoid is possible.

As illustrated, the upper portions of the bit-receiving sockets 5 and 6 are of a curvature corresponding to the shape of the bit, each socket being generally ovate in its several cross sections and extending from an end face of the bit block to its junction with the other at a point lying in a transverse vertical plane midway between the end surfaces of the bit block, and each having an upwardly and outwardly inclined upper surface 14, the surfaces 14 of the sockets 5 and 6 intersecting at said transverse vertical plane. When the cutter bit 8 is positioned in the manner shown in Fig. 3 within the socket 5, a holding bolt 15 is inserted in the bore 7 with its integral filler block head 16 shaped to fit the walls of the socket 6, the head 16 having its upper portion formed

of a cross section corresponding to the elliptical cross section of the cutter bit body as shown in Fig. 4. Threaded at 17 on the forward extremity of the holding bolt 15 is a tightening nut 18 engaging a clamping block 19 loosely mounted on the bolt 15 and having a plane clamping face 20 engaging the active cutting face 10 of the cutter bit. The cutter bit when in this position has its surface 21, forming the base of the "triangle," engaging the outer surface 14 of the bit socket 5 and its inactive cutting face 11 abutting a side of the bolt 15. The bolt 15 then performs a stop-pin function. When the tightening nut 18 is tightened, the clamping block 19 is moved into tight clamping engagement with the bit surface 10 to hold the cutter bit with a wedging action within the socket 5 in engagement with the relatively stationary clamping bolt 15. When the cutting point 12 becomes dull, the tightening nut 18 may be readily loosened and the clamping block 19 moved outwardly on the bolt 15, thereby enabling release of the cutter bit, and the bit turned end for end and re-inserted within the socket 5, and the bit is then again clamped in position within the bit block socket with the clamping block 19 at that time engaging the active cutting face 11 of the bit and the inactive cutting face 10 thereof abutting the relatively stationary holding bolt 15, the cutting point 13 at that time being in active cutting position. When it is desired to reverse the cutter chain, the clamping bolt 15 is removed from the bit block bore 7 and turned end for end with the filler head 16 then received in the socket 5 and the cutter bit clamped in position within the opposite socket 6.

In the modified form of construction shown in Figs. 6 and 7, the lug 22 of the bit block 1 is formed with oppositely disposed sockets 23 and 24 for selectively receiving the cutter bit 8. In this instance a clamping bolt 25 is insertable in the longitudinal bore 26 and is provided with a wedge-shaped head 27 having a surface 28 engageable with the inactive cutting face of the bit and a projection 29 engaging the active cutting face of the bit to clamp with a wedging action and retain the cutter bit within the bit block socket. The bolt 25 is threaded at 30 to receive a tightening nut 31. The filler block 32 is, in this instance, made separate from the holding bolt and is shaped to fit the walls of the socket 24, the upper portion of the filler block being of the same cross section as the cutter bit 8, as shown in Fig. 7. The tightening nut 31 when tightened engages the filler block 32 to clamp the bit, wedge block and filler block tightly in position within the bit block. As in the form of the invention above described, when it is desired to reverse the position of the cutter bit with respect to the bit block, the parts are removed from the bit block sockets and turned end for end with respect to the bit block, with the bit received in the socket 24 and the filler block 32 within the socket 23 at that time. Otherwise, this form of the invention is similar to that above described.

In the modified form of construction shown in Figs. 8 and 9, the cutter chain is non-reversible and comprises a bit block 33 having a lug 34 formed with a socket 35 opening through the forward face of the bit block. This socket is provided with an upwardly and outwardly inclined upper surface 36 and a longitudinally extending straight inner surface 37 with its upper portion of a cross section conforming to the elliptical

shape of the cutter bit body. The rear end of the socket 35 communicates with a transverse bore 38 drilled through the bit block lug. Formed longitudinally through the bit block lug with its axis inclined upwardly and outwardly is a bore 39 communicating with an enlarged bore 40 at the rear face of the bit block lug. Received in the bore 39 is a bolt 41 having an enlarged head 42 received in the bore 40, and this bolt is fixed with respect to the lug by a transverse holding pin 43. Received in a socket 44 upon the forward face of the bit block lug and communicating with the socket 35, is a clamping block 45 similar to the clamping block 19 and similarly having a plane face 46 engaging the active cutting face of the cutter bit for clamping the latter with a wedging action within the socket 35, the side 21 of the bit, forming the base of the triangle, engaging the surface 36 of the socket and the inactive cutting face of the bit abutting the inner straight socket surface 37. Threaded at 47 on the forward extremity of the bolt 41 is a tightening nut 48 for engaging the clamping block 45 to adjust the latter tightly into clamping position. The cutter bit 8 is reversible end for end within the bit-receiving socket in generally the same manner as the cutter bit shown in Figs. 3 and 6.

In the modified form of construction shown in Figs. 10 to 12 inclusive the cutter chain is likewise of the non-reversible type and comprises a bit block 50 having a lateral lug 51 formed with a socket 52 extending outwardly through the forward face of the bit block lug and communicating at its inner side with a longitudinal bore 53. Received in the bore 53 is a bolt and stop pin 54 having an enlarged head 55 fixed with respect to the bit block lug by a transverse holding pin 56 passing through the enlarged head of the bolt. The socket 52 is formed with an upwardly and outwardly inclined upper surface 57, and the cutter bit 8 when arranged therein has its side 21, forming the base of the triangle, engaging the surface 57 and its inactive cutting surface abutting the bolt 54, as clearly shown in Fig. 11. Loosely mounted on the bolt 54 is a clamping block 58 similar to the clamping blocks 19 and 45, and similarly having a plane face 59 engaging the active cutting face of the cutter bit for clamping the bit with a wedging action within the socket 52. Threaded at 60 on the forward extremity of the bolt 54 is a tightening nut 61 for engaging the clamping block 58 to adjust the latter tightly in clamping position. Formed in the forward face of the bit block lug is a socket 62 communicating with the bit-receiving socket 52 for receiving the clamping block 58. Otherwise this form of the invention is similar to that shown in Figs. 8 and 9 with the cutter bit similarly reversible within the bit-receiving socket.

As a result of this invention it will be noted that an improved cutter chain is provided, having a cutter bit of advantageous design, and improved holding means engageable with the bit for holding the bit in cutting position within the bit block. It will further be noted that by the provision of a bit block having oppositely disposed bit-receiving sockets and the improved holding means, the position of the cutter bit with respect to the bit block may be reversed at will, thereby enabling the cutter chain to operate as a reversible chain. It will still further be noted that an improved cutter bit is provided which may be readily and cheaply formed and having associated therewith holding means of

an extremely simple and rugged character. Other uses and advantages of the invention will be clearly apparent to those skilled in the art.

While I have in this application specifically described several forms which my invention may assume in practice, it will be understood that these forms of the same are shown for purposes of illustration, and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a reversible cutter chain, a bit block having oppositely disposed bit-receiving sockets opening through the opposite end faces of the block and a communicating longitudinal bore also opening through said opposite end faces of the block, a cutter bit receivable selectively within said sockets in a position projecting angularly outwardly therefrom, a holding bolt receivable in said longitudinal bore and having a filler block portion receivable selectively within said sockets, the filler block portion being receivable in one socket while the cutter bit is positioned within the other socket, and a clamping block loosely mounted on said bolt and engageable with the cutter bit for clamping the latter and said filler block portion within their respective sockets, the holding bolt with its filler block portion and the cutter bit being transposable end for end with respect to the bit block to enable the cutter chain to operate as a reversible chain.

2. In a cutter chain, a bit block having oppositely disposed communicating sockets opening through the opposite end faces thereof, a cutter bit receivable in one of said sockets, a holding bolt having a wedge block portion receivable in said bit-receiving socket and having a bolt-like portion projecting through said other socket, a filler wedge block receivable in said other socket, and a tightening nut threaded on said bolt and engageable with said filler block for clamping the parts in position.

3. In a reversible cutter chain, a bit block having oppositely disposed bit receiving sockets opening through the opposite end faces of the block and a communicating longitudinal bore, a

cutter bit receivable selectively within said sockets, a holding bolt receivable in said longitudinal bore, a filler block receivable selectively within said sockets, the filler block being receivable in one socket while the cutter bit is positioned within the other socket, and a clamping block engageable with the cutter bit for clamping the latter within a socket, said bolt when tightened securing said cutter bit and said filler block within their respective sockets, the clamping bolt, filler block and clamping block being reversible end for end with respect to said bit block for clamping the cutter bit within either socket.

4. In a cutter chain, a bit block having a longitudinal bore opening through its opposite ends and bit-receiving sockets also opening through its opposite ends and communicating with each other at their adjacent ends and also communicating with said bore, a cutter bit receivable selectively in said sockets, a clamping bolt receivable in said longitudinal bore from either end of the latter and having means for precluding its passage completely through said bore, a surface on the cutter bit being engageable with a surface on said bolt for preventing inward displacement of the bit when the latter is positioned within either socket, a clamping block loosely mounted on said bolt and engageable with the cutter bit for clamping said bit tightly within a socket, and a tightening nut threaded on said bolt for adjusting said clamping block relative to said bolt into bit clamping position.

5. In a cutter chain, a bit block having bit-receiving sockets opening through its opposite ends and a communicating longitudinal bore, a cutter bit receivable selectively within said sockets, a clamping element receivable in said bore and having a surface with which a surface on the cutter bit is engageable when said bit is positioned within either socket, a bit clamping block loosely mounted on said element for engaging a surface on the cutter bit for clamping the latter in a socket, and adjusting means mounted on said element and engaging said clamping block for adjusting the latter relative to said element into bit clamping position.

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