

Feb. 20, 1940.

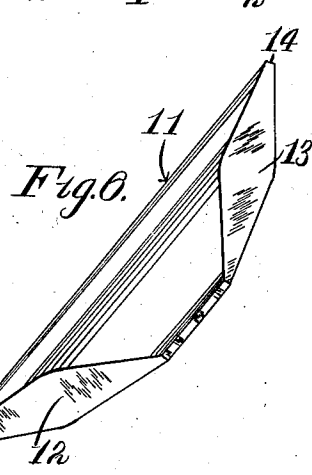
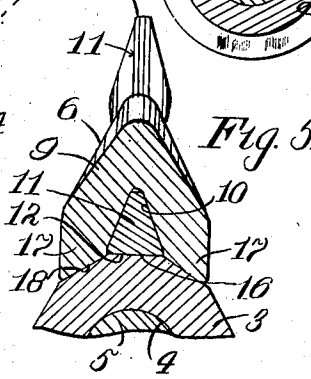
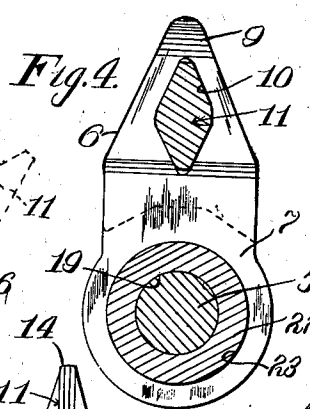
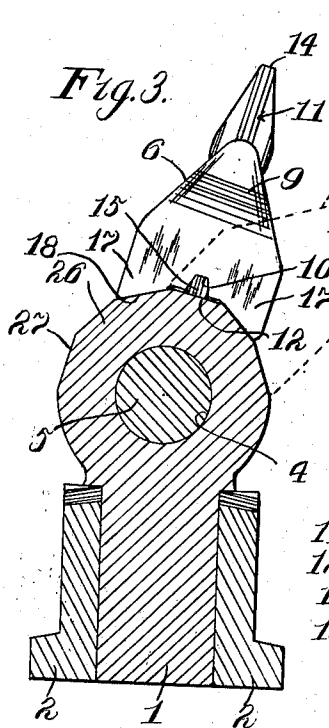
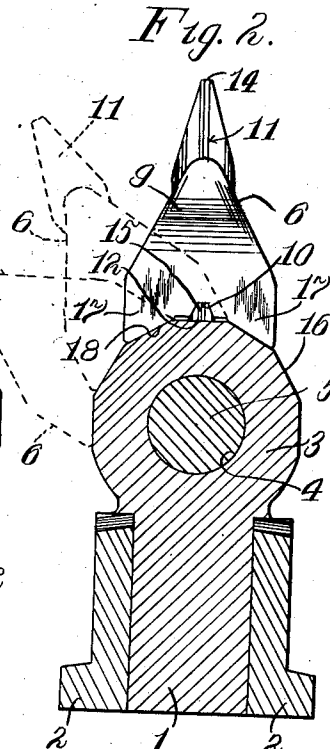
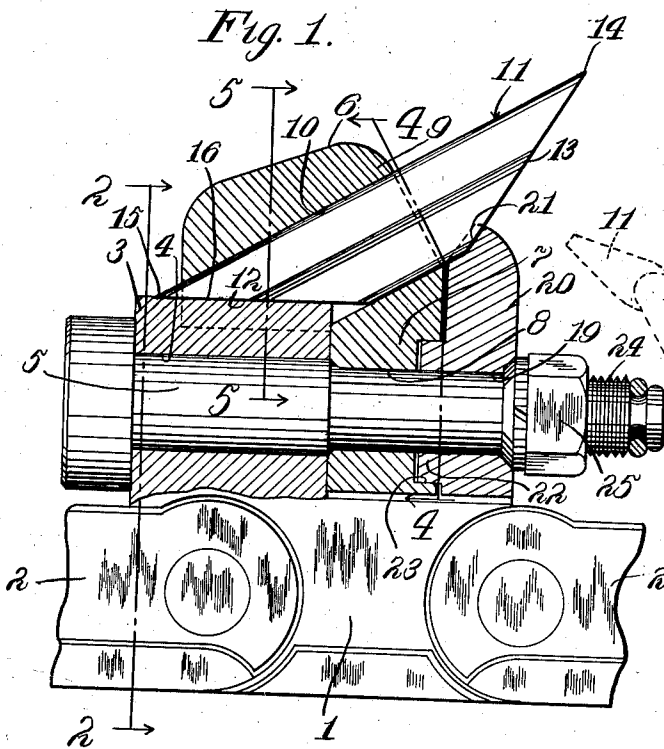
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2,190,674

CUTTER CHAIN

Filed Jan. 21, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7.

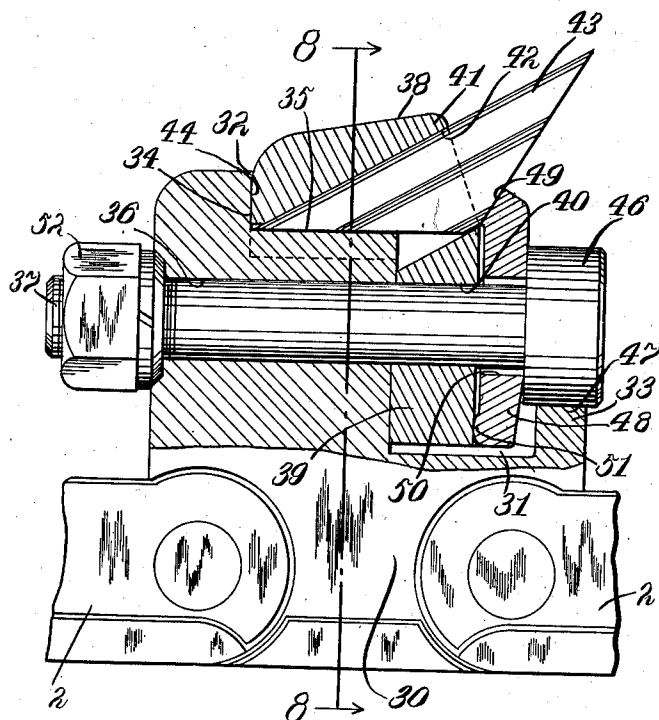


Fig. 8.

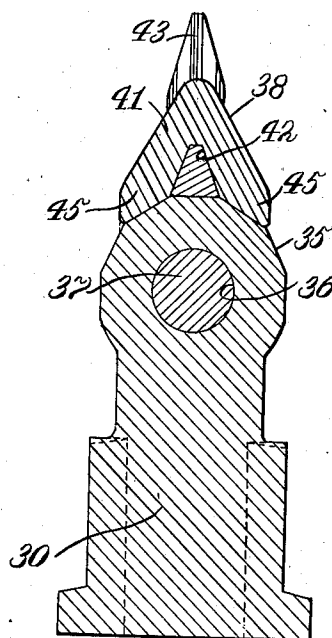


Fig. 9.

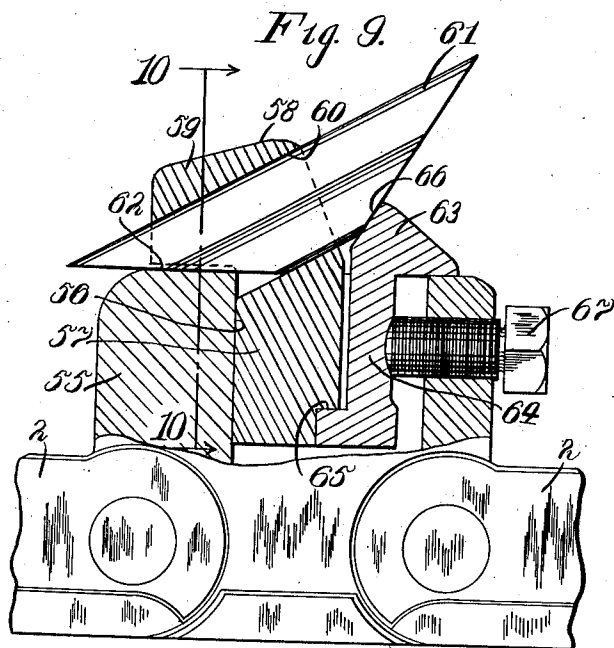
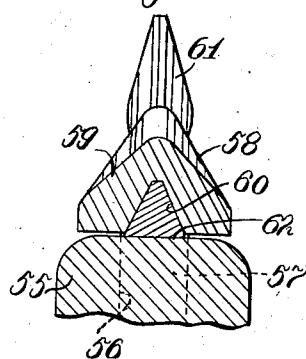


Fig. 10.



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UNITED STATES PATENT OFFICE

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CUTTER CHAIN

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Application January 21, 1936, Serial No. 60,081

7 Claims. (Cl. 262—33)

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

An object of this invention is to provide an improved cutter chain having improved bit holding means. Another object is to provide an improved cutter chain having an improved cutter block structure and improved means for holding the cutter bit on the cutter block. A further object is to provide an improved cutter bit holding means and cutter chain block whereby a cutter bit may be supported and held in any one of a plurality of positions with respect to the block in an improved and effective manner. A still further object is to provide an improved cutter chain wherein a single form of cutter block is used for supporting the cutter bits in a plurality of cutting positions. A further object is to provide an improved supporting and holding means for a reversible cutter bit of the double ended type. These and other objects and advantages 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 view in longitudinal section through one illustrative form of the improved chain block and bit supporting means.

Fig. 2 is a cross sectional view through the chain, taken substantially on line 2—2 of Fig. 1, and includes the holder and bit shown in end elevation.

Fig. 3 is a view similar to Fig. 2 showing a chain block with the holder positioning and bit engaging surfaces arranged in a different relation.

Fig. 4 is a cross sectional view taken substantially on line 4—4 of Fig. 1.

Fig. 5 is a detail sectional view taken substantially on line 5—5 of Fig. 1.

Fig. 6 is a perspective view of the cutter bit.

Fig. 7 is a view similar to Fig. 1 showing a modified form of construction.

Fig. 8 is a cross sectional view taken substantially on line 8—8 of Fig. 7.

Fig. 9 is a view similar to Fig. 1 showing still another modified form of construction.

Fig. 10 is a cross sectional view taken substantially on line 10—10 of Fig. 9.

In the illustrative form of the invention shown in Figs. 1 to 6, inclusive, the improved cutter chain comprises a series of chain blocks 1 pivotally connected together by means of a series of

strap links 2. Each of the chain blocks 1 has a lateral lug 3 having a longitudinal bore 4 for receiving a holding bolt 5, the latter having a circular head engaging the rear face of the lug. Mounted on the chain block is a bit holder 6 having a shank 7 formed with an opening 8 for receiving the holding bolt 5, and the head 9 of this holder is formed with an inclined socket 10 extending obliquely through the head for receiving in the inclined position a cutter bit generally designated 11 and shaped to fit the body of the bit.

The cutter bit 11 comprises a body generally in the form of a triangle in side elevation having opposed cutting surfaces 12 and 13 lying in the sides of an obtuse dihedral angle and terminating in cutting points 14 and 15 at the same side of the bit. The cutter bit may be advantageously formed by cutting from approximately diamond shaped, or other symmetrically shaped bar stock, forming the cutting surfaces 12 and 13 by cutting the stock diagonally and making successive diagonal cuts, completing a bit by turning over the stock between successive cuts. By selecting bar stock which is of symmetrical form with respect to axes at right angles to each other, the cutting faces of each bit will necessarily be the same, if the angle of the cutter to the bar stock be maintained the same. The cutting surfaces 12 and 13 are herein of elongated diamond shape, and are individually symmetrical as to both major and minor axial lines.

In this illustrative construction, the lateral lug 3 of the chain block is formed externally with relatively inclined flattened surfaces 16, seven in number, lying in the faces of a twelve-sided polygon, and the bit holder head at the opposite sides of the bit receiving socket is formed with lateral ledges 17 having inclined plane surfaces 18 engageable with certain of the flattened surfaces 16 on the chain block lug, while the inactive cutting face 12 of the cutter bit arranged within the bit holder socket engages a flattened surface 16 on the chain block lug intermediate the surfaces with which the bit holder ledges 17, 17 engage in the manner shown in Fig. 5. Mounted on the holding bolt 5 and having an opening 19 through which the holding bolt extends is a clamp member 20 having a socket 21 for engaging the inner portion of the active cutting face 13 of the bit, this clamping member having a cylindrical guide portion 22 fitting within a longitudinal guide bore 23 formed in the bit holder shank 7. The forward portion of the holding bolt 5 is threaded at 24 for receiving

a tightening nut 25, and when this nut is tightened the clamping member 20 holds firmly the cutter bit within the bit holder socket with the inner inactive face 12 of the bit resting on the flattened surface on the chain block lug. In Fig. 3 a chain block lug 26 is formed with flattened surfaces 27, six in number, relatively inclined and staggered with respect to the flattened surfaces 16 so that the bit holder may be secured in different relatively inclined positions with respect to the chain block lug. For instance, it will be noted that by releasing the holding bolt 5, the bit holder 6 may be positioned, as indicated in dotted lines in Fig. 2, and by suitably positioning the bit holder, the cutter bit may be located in five different positions with respect to the chain block lug, while in Fig. 3, the bit holder may be located in four different positions with respect to the chain block lug, the latter positions being located intermediate the bit positions shown in Fig. 2 so that a nine position chain is attained by means of but a pair of different chain blocks. When the bit holder is in the desired position with respect to the chain block lug, the holding bolt 5 may be tightened rigidly to clamp the cutter bit in cutting position. When the cutting end or point 14 of the bit becomes dull, the clamping member 20 may be readily released by loosening the nut 25, and the bit turned end for end within the holder socket; and the bit is then again clamped in position on the chain block lug, the cutting surface 12 at that time being active with the inactive cutting surface 13 engaging the flattened surface on the chain block lug.

In the modified form of construction shown in Figs. 7 and 8, the chain block 30 is transversely slotted at 31 to provide a lateral rearwardly located lug 32 and a front lug 33. The lug 32 is cut away at 34 and the cut away portion is formed externally with flattened surfaces 35 corresponding to the surfaces 16 and 27 of the form of the invention above described. The lug 32 is formed with a longitudinal bore 36 for receiving a holding bolt 37. Engaging the chain block lug is a bit holder 38 having a shank 39 having an opening 40 through which the holding bolt 37 passes, and the head 41 of this bit holder is formed with an inclined socket 42 extending therethrough for receiving a cutter bit 43. This cutter bit is similar to that shown in Fig. 6 with the exception that the cutting faces lie in the sides of a triangle and form a dihedral angle whose edge includes the opposite lateral extremity of the bit. The rear surface of the bit holder head abuts against the surface 44 of the cut away portion of the chain block lug, and the holder head is formed with lateral ledges 45, 45 similar to the ledges 17, 17 of the bit holder above described, and similarly engaging the flattened surfaces 35 on the chain block lug at the opposite sides of the surface with which the inactive cutting face of the bit engages. The holding bolt 37 is formed with a circular head 46 seated in an arcuate socket 47 formed on the front lug 33 of the chain block, and this head engages a clamping member 48 having a clamping surface 49 engaging the inner portion of the active cutting face of the bit, this clamping member having an opening 50 through which the holding bolt passes. The lower portion of this clamping member is formed with a lug 51 engaging the adjacent face of the bit holder shank so that when the holding bolt is tightened by adjusting a tightening nut 52

threaded on the bolt, the clamping member rocks about this lug relative to the bit holder to clamp firmly the cutter bit against the chain block lug within the bit holder socket. Otherwise this form of the invention is similar to that above described.

In the modification shown in Figs. 9 and 10, there is shown a cutter chain having a separate chain block 55 for each bit holder and each chain block is formed with a socket 56 for receiving the shank 57 of a bit holder 58. Each bit holder is formed with an enlarged head 59 provided with an inclined socket 60 extending therethrough for receiving a cutter bit 61 which is similar to that disclosed in Fig. 6 and formed in a similar manner. The inner inactive face of the cutter bit engages the outer surface 62 of the chain block. A clamping member 63 is provided having a shank 64 likewise projecting within the chain block socket 56 and slidingly interlocked at 65 with the shank of the bit holder, and this clamping member has a clamping surface 66 engaging the inner portion of the active cutting face of the bit. Threaded within the forward portion of the chain block is a standard set screw 67 for engaging the shank of the clamping member for tightly clamping the holder and bit in position on the block. By loosening the set screw 67 the clamping member 63 may be released so that the cutter bit may be turned end for end within the bit holder socket so that when one cutting point of the bit becomes dull, a new cutting point may be presented to the work.

As a result of this invention, it will be noted that an improved cutter chain is provided having an improved chain block structure and improved means for holding a cutter bit in cutting position on the chain block. It will further be noted that by providing the chain block lug with relatively inclined flat surfaces, it is possible to adjust the bit holder into different bit holding positions with respect to each lug so that by means of but a pair of chain block designs a nine position chain may be provided. Other uses and advantages of the improved cutter chain will be clearly apparent to those skilled in the art.

While there are in this application specifically described several forms which the 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 cutter chain, a chain block having a lateral lug, a detachable bit holder having an outwardly and forwardly inclined opening for receiving a cutter bit, a double-ended reversible cutter bit receivable in said holder opening, said cutter bit at its opposite ends having cutting faces terminating in cutting points, means for securing said holder on the block lug with the inactive cutting face of the bit resting on an outer surface of the lug, and means for selectively locating said holder and bit in different relatively inclined positions laterally with respect to the lug.

2. In a cutter chain, a chain block having a lateral lug, a detachable bit holder having a head formed with an inclined opening for receiving a cutter bit, a double-ended reversible cutter

bit receivable in said holder opening and reversible end for end therein, means for locating said holder and cutter bit selectively in any one of a plurality of relatively inclined cutting positions laterally with respect to the block lug with the inactive cutting end of the bit resting on an outer surface of the block lug, and means for securing said holder and cutter bit to said lug in any of aforesaid relatively inclined positions with respect thereto.

3. In a cutter chain, a chain block having a lateral lug formed with relatively inclined flattened surfaces, a bit holder for receiving a cutter bit and provided with relatively inclined surfaces engageable with certain of said inclined surfaces on the lug, an end of the bit resting on a flattened surface on the lug intermediate said surfaces on said bit holder, and means for securing said holder in position on the chain block lug.

4. In a cutter chain, a chain block having a lateral lug formed with relatively inclined flattened surfaces, a detachable bit holder having an inclined socket for receiving a cutter bit and provided with relatively inclined surfaces engageable with certain of said inclined surfaces on the lug, an end of the bit resting on a flattened surface on the lug intermediate said surfaces on said bit holder, and means for securing said holder in position on the chain block lug, said holder adjustable into different relatively inclined positions with respect to the lug with said inclined holder surfaces and said bit end engaging others of said relatively inclined lug surfaces.

5. In a cutter chain, a chain block having a

lateral lug, a bit holder having an obliquely disposed socket for receiving a cutter bit, a cutter bit disposable in an inclined cutting position within said holder socket with its cutting end projecting outwardly and forwardly from the holder, means for securing said holder on the block lug with an end of the bit resting on the outer surface of the lug, and means for selectively locating the holder and bit in different inclined cutting positions laterally with respect to the lug.

6. In a cutter chain, a chain block having a lateral lug formed with relatively inclined flattened surfaces, a detachable bit holder having an inclined socket for receiving a cutter bit for supporting the latter with its cutting end projecting outwardly from the holder, said holder provided with relatively inclined surfaces engageable with certain of said surfaces on said lug, and means for securing said holder in position on said chain block lug with said surfaces in engagement.

7. In a cutter chain, a chain block, a double-ended reversible cutter bit having aligned cutting ends, bit holder means for securing the bit in cutting position on the chain block with its inner inactive cutting end resting on a surface on the block, and means for selectively locating said holder means and bit laterally in different relatively inclined cutting positions with respect to the chain block, said bit releasable in an endwise direction from said holder means and reversible end for end with respect to said holder means in any of aforesaid relatively inclined cutting positions.

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