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CUTTER CHAIN

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2 Sheets-Sheet 2

Fig. 7.

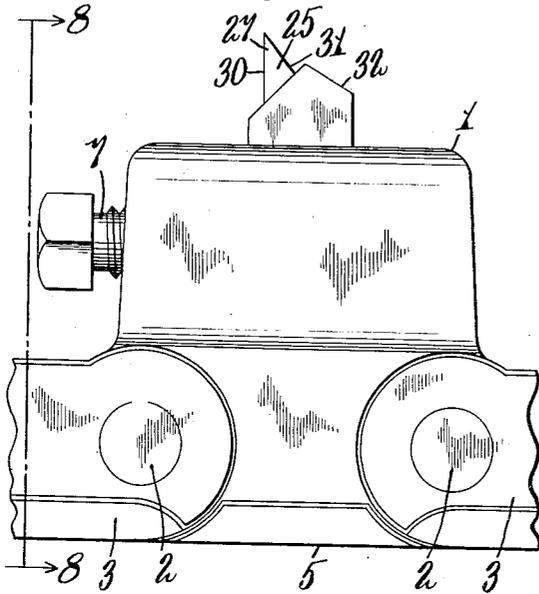


Fig. 8.

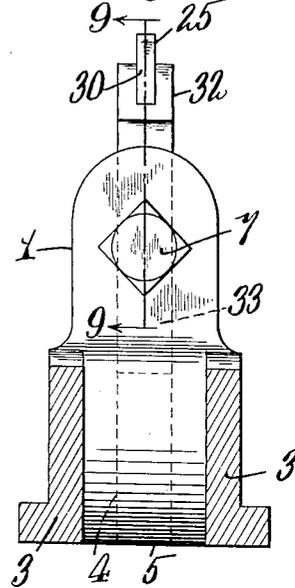


Fig. 9.

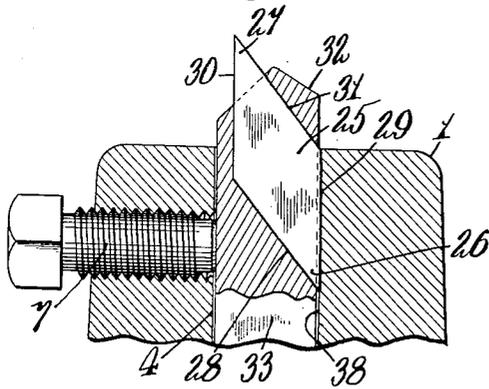


Fig. 10. Fig. 11.

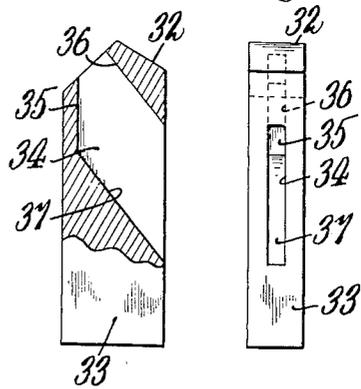
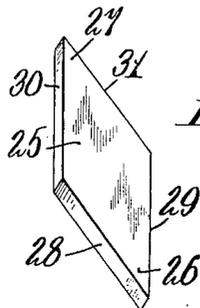


Fig. 12.



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UNITED STATES PATENT OFFICE

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CUTTER CHAIN

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Application May 29, 1933, Serial No. 673,483
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12 Claims. (Cl. 262—33)

This invention relates to cutter chains, and more particularly to improvements in cutter chains especially designed for use with coal cutting machines.

5 An object of this invention is to provide an improved cutter chain. Another object is to provide an improved cutter bit having a plurality of cutting points whereby when one point becomes dull another point may be presented to the work. A
10 further object is to provide an improved cutter bit holding means. These and other objects will, however, subsequently more fully appear.

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

In these drawings—

Fig. 1 is a side elevational view of a section of a cutter chain equipped with one illustrative embodiment of the improved cutter bit and its associated holding means.
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Fig. 2 is a cross sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a longitudinally extending vertical sectional view taken substantially on line 3—3 of Fig. 2.
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Fig. 4 is a detail sectional view showing the improved cutter bit holder.

Fig. 5 is a rear elevational view of the bit holder shown in Fig. 4.

30 Fig. 6 is an isometric view showing the improved cutter bit.

Fig. 7 is a view similar to Fig. 1, showing a modified form of cutter bit and cutter bit holding means.

35 Fig. 8 is a vertical section on the plane of the line 8—8 of Fig. 7, showing a front end elevational view of the cutter chain block, bit and holder shown in Fig. 7.

40 Fig. 9 is a longitudinally extending vertical sectional view taken substantially on line 9—9 of Fig. 8.

Fig. 10 is a detail sectional view showing the modified form of bit holder.

45 Fig. 11 is a rear elevational view of the bit holder shown in Fig. 10.

Fig. 12 is an isometric view showing the modified form of cutter bit.

In the illustrative construction shown in Figs. 1 to 6, inclusive, the cutter chain comprises a chain or bit block 1 pivotally connected by transverse pins 2 to side straps 3, the side straps connecting the chain blocks together. The chain block is traversed by a socket 4 in the present instance, said socket extending perpendicularly to the inner plane guiding surface 5 of the cutter chain.
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As shown in Fig. 3, the rear wall of the chain block is perforated by a threaded opening 6 for receiving a set screw 7 for holding the cutter bit holder in position within the chain block. As clearly shown in Figs. 3 and 6, the cutter bit 8 is
5 generally triangular in shape in side elevation, comprising a body 9 having a plurality, herein three, of radially located, equally spaced cutting points 10, 11 and 12. These cutting points 10, 11
10 and 12 are each provided with a cutting edge 13 and a front cutting surface 14, the cutting surfaces intersecting at the cutting edges with rearwardly inclined surfaces 15 at the receding side of the cutting edge. The cutter bit holder 16 has
15 a shank 17 projecting within the chain block socket and a head provided with a socket 18 opening through the rear surface of the bit holder and formed by relatively inclined outer surfaces 19 and 20 and relatively inclined inner surfaces 21 and 22. The surfaces 20, 22 of the socket co-
20 operate to form a tapered opening for receiving, in the position of the parts shown, the bit point 12, the relatively inclined surfaces 14, 15 of the bit point engaging the surfaces 20 and 22, respectively. Forwardly of this opening is an enlarged
25 opening bounded by the surfaces 19 and 21, these surfaces respectively engaging the surface 15 of the point 10 of the bit and the surface 14 of the cutting point 11. When the bit and bit holder are in the position shown in Fig. 3, with the set screw
30 engaging the bit holder shank to hold rigidly the bit and bit holder within the bit block socket, the point 11 of the bit projects within the bit holder socket with its surface 15 engaging the forward surface 23 of the chain block socket, and the bit
35 is clamped in position between the surface 23 of the chain block socket and the surfaces 21 and 22 of the socket within the bit holder. The surfaces 19 and 20 of the bit holder socket engage the outer surfaces of the bit, thereby holding the
40 bit point 11 in the position shown.

In the modified form of construction shown in Figs. 7 to 12, inclusive, the cutter chain construction is identical to that above described, with the exception that in this instance the front wall of
45 the bit block is provided with a threaded opening for receiving the set screw 7, and the set screw acts on the forward edge of the bit holder to clamp the latter in position within the bit block socket. In this form of construction the cutter
50 bit 25 is generally of diamond shape in side elevation and is provided with oppositely extending cutting points 26 and 27 having relatively inclined surfaces 28, 29 and 30, 31, respectively, the surfaces 28, 30 and 29, 31 intersecting in lines in a
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transverse plane at right angles to a longitudinal plane including the cutting edges of the cutting points. The cutter bit holder 32 is provided with a shank 33 projecting within the bit block socket and engaged by the set screw 7. Formed in the head of this bit holder is a bit receiving socket 34 having upwardly converging surfaces 35 and 35 engageable with the surfaces 30 and 31 of the cutter bit in the position of the parts shown. The bit socket 34 is provided with an inner inclined surface 37 parallel with the surface 36 for engaging the surface 23 of the cutter bit. When the parts are in the position shown in Fig. 9, the cutter bit is arranged within the bit holder socket with the surface 29 of the cutter bit engaging the rearward surface 38 of the bit block socket.

In the use of the form of the invention disclosed in Figs. 1 to 6, inclusive, when the bit point 10 becomes dull the set screw 7 may be released and the bit holder removed from the bit block socket. The bit is then removed from the socket in the bit holder and turned into a position so that one of the other sharp points then becomes active, the parts thereafter being re-inserted within the bit block socket and the set screw then tightened. In the form of the invention shown in Figs. 7 to 12, inclusive, when the point 27 becomes dull the set screw is released and the bit holder removed from the bit block socket. The bit is then turned end for end within the bit holder socket and thereafter the parts are again inserted in position within the bit block.

As a result of this invention, it will be noted that an improved cutter chain is provided having an improved cutter bit and cutter bit holding means. It will further be noted that an improved cutter bit is provided having a plurality of cutting points and having improved bit holding means whereby when one of the points becomes dull, the relation of the bit with respect to the holding means may be changed to bring another cutting point into active cutting position. It will further be noted that in both forms of the invention the cutter bit is of an extremely simple and inexpensive design, and may readily be replaced when worn out, at a minimum of expense. These and other uses and advantages of the improved cutter bit will be clearly apparent to those skilled in the art.

While I have in this application described two forms which my invention may assume in practice, it will be understood that these forms are shown for purposes of illustration only 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, the combination of a chain block having a socket arranged at right angles to the path of travel of the cutter chain, a cutter bit having more than two radially located equi-distantly spaced cutting portions, each cutting portion terminating in a cutting point, and a detachable bit holder having a portion insertible inwardly within said chain block socket and a head projecting outwardly from said chain block, said head having an opening extending therethrough for receiving the cutter bit, and said holder engaging said bit to the rear of the active cutting portion thereof for holding said bit in cutting position on the bit block with the cutting portions of the bit lying in common planes extending longitudinally of the chain block, the active cutting portion of the bit projecting out-

wardly and forwardly with respect to said holder head.

2. In a cutter chain, the combination of a bit block having a socket, a cutter bit having more than two radially located equi-distantly spaced projections each having a cutting point, and a bit holder receivable in said bit block socket and engaging all of said projections to the rear of the active cutting point of said bit for holding said bit in cutting position on said bit block.

3. In a cutter chain, the combination of a bit block having a socket, a cutter bit having more than two radially located equi-distantly spaced projections each presenting a cutting point, one of said projections extending within said bit block socket, a bit holder receivable in said bit block socket and having a socket for receiving portions of said cutter bit, said bit holder engaging all of said projections to the rear of the active cutting point of said bit for holding said bit in cutting position on said bit block.

4. In a cutter chain, the combination of a chain block having a socket arranged at right angles to the path of travel of the cutter chain, a cutter bit having three radially located equidistantly spaced cutting portions, each cutting portion terminating in a cutting point, an inactive one of said cutting portions projecting within said chain block socket, and a detachable bit holder having a portion insertible inwardly within said chain block socket and a head projecting outwardly from the chain block, said head having an opening extending therethrough for receiving the cutter bit, said holder engaging said cutter bit rearwardly of the active cutting portion thereof for holding said bit in cutting position on said chain block with the active cutting portion projecting outwardly and forwardly with respect to said chain block and holder head.

5. In a cutter chain, the combination of a bit block having a socket, a cutter bit having not less than two similar cutting portions, one of said portions projecting within the bit block socket, and a bit holder having a shank receivable in said bit block socket and a socket extending completely through the holder for receiving a cutting portion of the bit for holding the bit in cutting position on the bit block, said holder socket opening through one end surface of the holder and said bit being insertible in the holder socket inwardly of said end surface prior to the insertion of the holder shank in the bit block socket.

6. In a cutter chain, the combination of a bit block having a socket arranged at right angles to the path of travel of the cutter chain, a cutter bit having not less than two similar cutting portions, an inactive one of said cutting portions projecting within the bit block socket and having a plane surface engaging one surface of the bit block socket, and a detachable bit holder having a shank insertible inwardly within said bit block socket and an integral head projecting outwardly from said bit block, said holder head having an opening extending therethrough for receiving an inactive cutting portion of the bit for holding the bit in cutting position on the bit block with the active cutting portion of the bit projecting outwardly and forwardly from the bit holder head.

7. In a cutter chain, the combination of a bit block having a socket, a cutter bit having not less than two similar cutting portions, one of said portions projecting within the bit block socket, and a bit holder having a shank receivable in said bit block socket and having a socket extending completely

therethrough for receiving a cutting portion of the bit for holding the bit within the bit block, said holder socket opening through one end surface of said holder and said bit being insertible in said holder socket inwardly of said end surface prior to the insertion of the holder shank in said bit block socket, said bit block when said holder shank is inserted in the bit block socket retaining said bit in said holder socket.

8. In an endless cutter chain, a series of pivotally connected chain blocks, a cutter bit carried by each chain block, each cutter bit comprising a body having three equally spaced radially located projections, each projection terminating in a cutting point, and means associated with said chain blocks and cutter bits for holding the latter in cutting position on said blocks with one of said cutting points of each bit in an outwardly projecting cutting position, said holding means engaging said projections rearwardly of the active cutting portions of said outwardly projecting cutting points, and said bits, when in cutting position on the blocks, each having a surface thereof engaging a surface on a bit block.

9. In a cutter chain, a series of articulated chain blocks, each having a socket disposed substantially at right angles to the path of movement of the chain, a bit holder having a head and a shank, said shank insertible in said chain block socket, adjustable means on the block for securing the holder shank in said block socket, said holder head having a bit-receiving socket extending completely therethrough and opening through the front and rear faces of the holder head, a cutter bit having spaced cutting portions formed with mutually inclined surfaces lying in the sides of a dihedral angle and terminating in cutting points, said bit receivable in said holder head socket with one cutting portion thereof projecting through the holder socket rearwardly of the rear face of the holder head and its active cutting portion projecting forwardly and outwardly from the holder socket at the front face of the holder head, said block having thereon, at the forward side of the holder socket and in such relation to said block that said holder can be inserted in and wholly removed from said block socket while the position relative to said block of such surface remains unchanged, a rearwardly facing surface providing an abutment for retaining the bit in and against forward release from the holder socket when said holder shank is inserted inwardly within the chain block socket, and said cutter bit having a forwardly facing surface thereof engageable with said rearwardly facing surface, said cutter bit releasable forwardly from and reversible within said holder head socket when said holder is released by said adjustable means and moved outwardly from the chain block socket, to present a sharp cutting point to the work when the point previously used becomes dull.

10. In a cutter chain, a bit block having a socket arranged at right angles to the path of travel of the cutter chain, a cutter bit comprising a body having three equally spaced radially located projections, each projection terminating in a cutting point, and a detachable bit holder hav-

ing a shank insertible inwardly within said bit block socket, said holder having a head projecting outwardly from said bit block and an opening extending through said head for receiving the cutter bit, said holder engaging the cutter bit for holding the latter in cutting position on said block with the active one of said cutting points of the bit in an outwardly projecting cutting position and all of said cutting points lying in common planes extending longitudinally of the bit block, and means carried by the bit block and engaging the holder shank for tightly securing the holder on the bit block.

11. In an endless cutter chain, a series of pivotally connected bit blocks, a cutter bit carried by each bit block, each cutter bit comprising a body having three equally spaced radially located projections, each projection terminating in a cutting point, and means associated with said bit blocks and cutter bits for holding the latter in cutting position on the blocks with the cutting points of each bit lying in common planes extending longitudinally of the block and with one of said cutting points of each bit in an outwardly projecting cutting position, said holding means engaging all of said bit projections rearwardly of the active cutting portion of said outwardly projecting cutting point.

12. In a cutter chain, a series of articulated chain blocks each having a socket disposed at substantially right angles to the path of movement of the chain, a bit holder having a head and a shank, said shank insertible in said chain block socket, adjustable means on the block for securing said holder shank in said chain block socket, said holder head having a bit receiving socket extending completely therethrough and opening through the front and rear faces of the holder head, a cutter bit having spaced cutting portions formed with mutually inclined surfaces terminating in cutting points, said bit receivable in said holder head socket with an inactive cutting portion thereof projecting through the holder socket rearwardly of the rear face of the holder head and an active cutting portion projecting forwardly and outwardly from the holder socket at the front face of the holder head, said cutter bit having a forwardly facing surface thereof engageable with a rearwardly facing surface stationary with respect to the chain block at the forward side of the holder, which latter surface provides an abutment for retaining the bit in and against forward release from the holder head socket when said holder shank is inserted inwardly within the chain block socket and which latter surface is further so related to said block that complete withdrawal and insertion of said holder with respect to the block socket may be effected while said surface remains stationary with respect to said chain block, said cutter bit releasable forwardly from and reversible within said holder head socket when said holder is released by said adjustable means and moved outwardly from the chain block socket, to present a sharp cutting point to the work when the point previously used becomes dull.

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