Jan. 9, 1940. L. E. SIMMONS 2,186,502

CUTTER CHAIN

Original Filed June 27, 1933

Fig. 1.

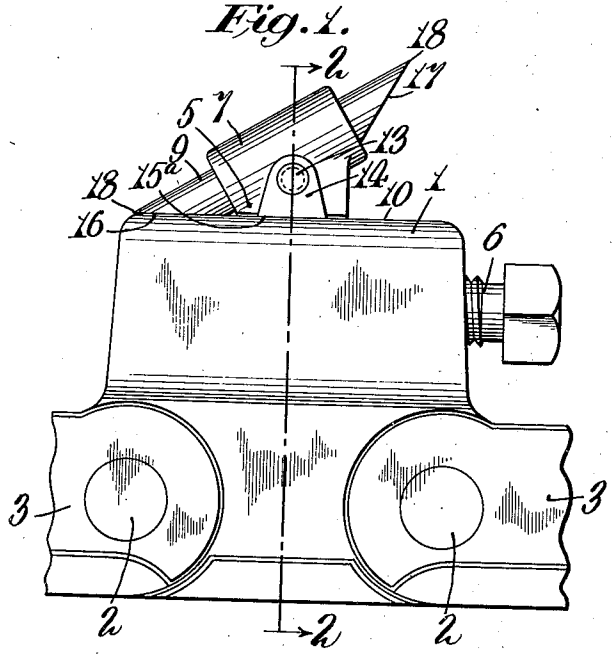


Fig. 2.

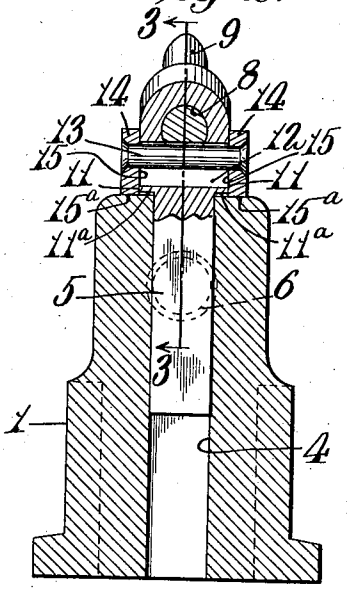


Fig. 3.

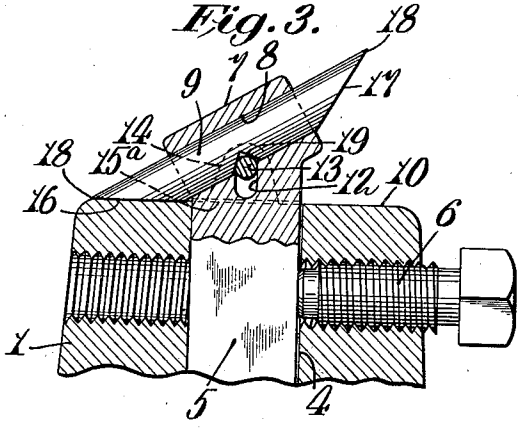


Fig. 4.

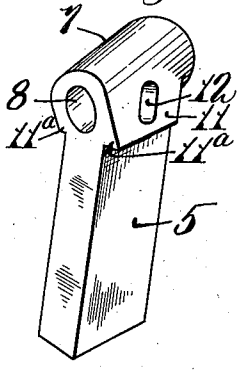
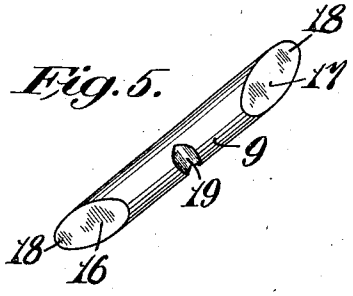


Fig. 5.



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UNITED STATES PATENT OFFICE

2,186,502

CUTTER CHAIN

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Application June 27, 1933, Serial No. 677,880
Renewed March 13, 1939

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.

An object of this invention is to provide an improved cutter chain. Another object is to provide an improved cutter chain having embodied therein improved means for holding the cutter bit in place on the bit block. Still another object is to provide an improved cutter bit. Yet another object is to provide an improved cutter bit and cutter bit holding means and means associated with the bit and holding means for holding the cutter bit in position therein. These and other objects of the invention will, however, hereinafter more fully appear.

In the accompanying drawing there is shown for purposes of illustration one form which the invention may assume in practice.

In this drawing—

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

Fig. 2 is a cross sectional view taken substantially on line 2—2 of Fig. 1.

Fig. 3 is a longitudinal sectional view taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a perspective view of the bit holder, with the bit locking pin removed.

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

In this illustrative embodiment of the invention the improved cutter bit and bit holding means are shown associated with a cutter chain of a standard commercial design comprising a bit block 1 pivotally connected at 2 to side straps 3. The bit block is traversed by a socket 4 for receiving the shank 5 of the improved bit holder. Threaded within the bit block is a set screw 6 for engaging the bit holder shank for securing the bit holder within the bit block socket. It will be evident, however, that the improved bit and bit holding means may be used, with or without minor modification, in cutter chains of various other types, and it is therefore not desired to limit the invention to the particular type of cutter chain shown.

Now referring to the improved bit and bit holding means, it will be noted that formed integral with the bit holder shank 5 is a generally cylindric body 7 having an opening 8 of circular cross section herein forming a socket for receiving the cylindrical body 9 of the improved cutter bit. The bit socket 8 is herein formed at an angle with respect to a line parallel with the outer surface 10 of the bit block and is inclined upwardly and forwardly in the manner shown. The bit holder body 7 is provided with lateral plane surfaces 11, 11 terminating at shoulders 11a, 11a. The cylindric body 7 of the bit holder is transversely slotted at 12, and slidably arranged within this slot for movement in a direction transverse to its length is a holding pin 13 secured at its ends within support elements 14, 14 each having an inner plane surface 15 slidably engaging a surface 11, and also having a lower plane surface 15a adapted to rest on the surface 10 of the bit block, in the manner shown in Fig. 2, when a bit is being held in the holder.

The cutter bit per se is in the form of a cylindrical rod section having beveled end surfaces 16 and 17 forming cutting points 18 at the opposite ends of the cylindrical bit body. The bit may be formed from various symmetrically shaped bar stock, and it is not desired to limit the invention to the particular shape shown. The cutter bit has its points 18, 18 at its opposite ends, and at its extremities has elongated faces which are identical in outline, which lie in planes forming a dihedral angle, and which are individually symmetrical as to both major and minor axial lines. The cylindrical bit body is, at 19, transversely slotted, preferably with a V-shaped notch, in its side diametrically opposite the points 18, and midway between its ends, for receiving the holding pin 13 when the parts are in the position shown in Fig. 3, to lock the bit against axial displacement within the bit holder socket 8. When the parts are in the position shown in Fig. 3, the beveled end surface 16 of the bit rests on the surface 10 of the bit block, while the opposite surface 17 extends upwardly and forwardly and is the then active cutting surface. The surface 16 then takes the pressure from the cutting while the pin 13 prevents withdrawal or chattering of the bit. When the active cutting point 18 of the cutter bit becomes dull, the parts may be loosened within the bit block socket and the bit holder may be moved outwardly to permit the pin 13 to move out of the slot 19 in the bit body, thereby permitting withdrawal of the bit axially from the bit holder socket. The bit may then be turned end for end within the bit holder socket, so that the beveled surface 17 will engage the surface 10 of the bit block and the surface 16 extend upwardly and forwardly and become the then active cutting surface. The bit holder shank is inserted inwardly until the surface 17 engages the surface 10, and the surfaces 15a of the supporting elements 14, 14 also engage the surface 10. Thus, as further inward movement of the holder 5 is

effected the bit will be moved forwardly in the bore 8 and the pin 13 upwardly into the notch 19, and when the pin 13 prevents further forward movement of the bit and the wall of the notch prevents further outward movement of the pin 13 the screw 6 is tightened and the bit is tightly held.

As a result of this invention, it will be noted that an improved cutter chain is provided having a cutter bit of improved design and an improved holding means engageable with the bit for holding the bit in place within the bit block socket. It will further be noted that the improved cutter bit is provided with oppositely disposed cutting points and may be inserted in either direction within the bit holder socket and held therein by the improved holding means engaging the bit intermediate its ends. It will still further be noted that the improved cutter bit and bit holding means may be used with a cutter chain of a standard design and may be readily and cheaply manufactured, the cutter bit holder being of an extremely simple and inexpensive design. These and other uses and advantages of the improved cutter chain will be clearly apparent to those skilled in the art.

My invention in this application is subordinate to the inventions of Morris P. Holmes, disclosed and claimed in his applications for improvements in Cutter chains, Serial Nos. 649,003 and 658,804, filed respectively on Dec. 27, 1932 and Feb. 27, 1933; and I do not claim, and indeed expressly disclaim, any invention common to the disclosures of either or both of said Holmes applications and this present application.

While there is in this application specifically described one form which the invention may assume in practice, it will be understood that this form of the same is 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.

I claim:

1. In a cutter chain, in combination, a bit block, a detachable cutter bit holder carried by said bit block and having a forwardly and outwardly inclined opening for receiving a cutter bit, a cutter bit receivable in said holder opening and having a forwardly facing abutment surface thereon, adjustable means mounted on said holder and guided on said holder for relative movement bodily with respect thereto, said means engaging a surface on said bit block and said forwardly facing abutment surface for securing the cutter bit against forward axial release from said holder opening and said holder having guiding means thereon for said adjustable means within which the latter is movable longitudinally of said holder and which guiding means on the holder coact with the forwardly facing surface of said adjustable means to preclude displacement of said adjustable means forwardly with respect to the holder whereby the adjustable means holds the bit against forward movement in said opening and releasable means for securing said holder on said bit block.

2. In a cutter chain, in combination, a bit block, a detachable cutter bit holder carried by said bit block and having a forwardly and outwardly inclined opening extending completely therethrough for receiving a cutter bit, a cutter bit receivable in said holder opening and having a forwardly facing abutment surface thereon, the rearward end of said bit projecting outwardly from said holder opening into engagement with an outer surface on said bit block, adjustable means mounted on said holder and guided on said holder for relative bodily movement with respect thereto, said adjustable means confined, entirely by the guidance afforded by said holder, against bodily movement forwardly with respect to said holder and said adjustable means engaging a surface on said bit block and said forwardly facing abutment surface for securing said cutter bit against forward axial release from said holder opening with said rear end of said bit in firm engagement with said bit block surface, and releasable means for securing said holder on said bit block.

3. In a cutter chain, in combination, a bit block having a socket, a detachable cutter bit holder having an elongated shank portion receivable in said bit block socket and having a forwardly and outwardly inclined opening extending completely therethrough for receiving a cutter bit from either end thereof, a cutter bit insertble within said holder opening from either end of said opening and having a forwardly facing abutment surface thereon, means for securing said cutter bit within said holder opening with the rear end of said bit engaging a surface on said bit block and for locking said bit against forward axial release from said holder opening comprising adjustable means mounted on said holder and guided on said holder for relative bodily movement longitudinally of the holder but confined, entirely by the guidance afforded by said holder, against bodily movement forwardly with respect to said holder, said adjustable means engaging said forwardly facing abutment surface, insertive movement of said holder shank portion within said bit block socket effecting clamping of the rear end of said cutter bit against the outer surface of the bit block upon engagement of said adjustable means with said forwardly facing abutment surface, and releasable means for securing said holder shank portion within said bit block socket.

4. A cutter chain block having a bit holder supporting head, a bit holder removably engaged with said chain block head, said bit holder carrying a bit in an inclined position therein for abuttingly engaging one end of said bit against said chain block head, and a bit holding element carried and guided by and movable bodily relative to and longitudinally of said bit holder and engageable with the bit exclusively at a part of the latter which is substantially midway between the ends thereof for holding the bit in said holder.

5. In a cutter bit and link, in combination, a cutter bit having a body formed with a pair of opposite end surfaces forming cutting surfaces at its opposite ends, means for holding said bit against movement in a direction opposite to the direction of travel during cutting including a surface parallel to the direction of travel of the bit during cutting engaged by the inactive cutting surface and another surface at an acute angle to the first mentioned surface and engaged by the back of the bit, and a holding element bodily adjustable relative to said fourth surface and engaging said bit only at an intermediate portion of the bit body spaced from both of said end surfaces and from the back of the bit for preventing forward withdrawal of the bit.

6. A cutter bit holding means having a socket, the outer wall of the socket being inclined forwardly and outwardly, a double ended bit having oppositely inclined end surfaces forming cutting

faces and a body receivable in said socket and providing a forwardly facing holding abutment surface substantially to the rear of the rearmost portion of the forward end surface of said bit, said bit having a surface engageable with the inclined outer surface of the socket and the inner inactive cutting face of the bit engaging a surface on the holding means along a line parallel with the path of movement of the bit and holding means during cutting, and a holding device adjustable relative to said bit receiving socket and engageable with said forwardly facing abutment surface which is spaced from the active-cutting-face-forming end surface of the bit for precluding forward release of the bit from said socket.

7. In a cutter chain, a bit block having a socket, a cutter bit having at its opposite ends plane cutting faces, a holder insertible in said bit block socket and having a socket for receiving the bit body for holding the cutter bit on the bit block with the inactive plane cutting surface of the bit engaging the outer surface of the bit block, and adjustable means carried by said holder and mounted thereon for guided movement relative thereto, said adjustable means engaging said bit only at an intermediate portion of the latter spaced from both of its cutting faces and located substantially midway between the ends of the bit for locking the bit in the bit holder socket.

8. In combination, a bit block having a socket for receiving a bit holder, a bit holder receivable within said socket and having an obliquely disposed bit-receiving opening therein, a cutter bit receivable in said opening and projecting forwardly therefrom, and means for securing said bit in position against forward escape including a pin carried by said bit holder and guided wholly by said holder for reciprocation longitudinally of said holder relative to the latter and engageable with said bit when said holder is inserted in the bit block socket.

9. In a cutter chain, in combination, a bit block having a socket, a detachable cutter bit holder having head and shank portions, said shank portion receivable in said bit block socket and said head portion having a bit-receiving opening extending therethrough and a guideway extending longitudinally of said shank portion, a cutter bit receivable in said head portion opening and having a transverse notch between its ends, means mounted on said holder for locking said bit against endwise release from said opening including a transverse abutment member reciprocably guided in said head portion guideway and engageable with said notch, and releasable means for securing said holder shank portion within said bit block socket.

10. In a cutter chain, in combination, a bit block having a socket, a detachable cutter bit holder having head and shank portions, said shank portion receivable in said bit block socket and said head portion having a bit-receiving opening extending therethrough and a guideway extending longitudinally of said shank portion, a cutter bit receivable in said head portion opening and having a transverse notch between its ends, means mounted on said holder for locking said bit against endwise release from said opening including a transverse abutment member reciprocably guided in said head portion guideway and engageable with said notch, and elements arranged at the opposite sides of said head portion and to which said abutment member is secured, said elements engageable with an outer surface on the bit block, insertive movement of said holder shank portion within said bit block socket relative to said abutment member effecting movement of said notch into engagement with said abutment member, and said elements by engagement with the outer block surface maintaining said abutment member stationary with respect to said block during such insertive movement, and releasable means for securing said holder shank portion within said bit block socket.

11. In a cutter chain, the combination comprising a bit block, a detachable cutter bit holder carried by said bit block and having a forwardly and outwardly inclined opening for receiving a cutter bit, a cutter bit receivable in said holder opening and having a forwardly facing abutment surface thereon, adjustable means mounted on said holder and guided on said holder for relative movement bodily longitudinally of said holder, said holder having longitudinally extending guiding means thereon for said adjustable means precluding movement of the latter forwardly with respect to the holder, said adjustable means resting against an outer surface of said bit block and engaging said forwardly facing abutment surface of said bit for securing said bit against forward axial release from said holder opening, and releasable means for securing said holder on said bit block.

12. In a cutter chain, the combination comprising a bit block having a socket, a detachable cutter bit holder receivable in said block socket and having an opening extending completely therethrough for receiving a cutter bit, a cutter bit receivable in said holder opening with its rear end engaging an outer surface of said bit block, said cutter bit having a forwardly facing abutment surface, adjustable means mounted on said holder and guided on said holder for bodily relative movement longitudinally with respect to said holder and confined, entirely by the guidance afforded by said holder, against bodily movement forwardly with respect to said holder, said adjusting means resting on an outer surface of said bit block wholly outside the bit block socket and engaging said bit abutment surface for securing the rear end of said bit against the outer surface of said bit block, and releasable means for securing said holder in said bit block socket.

LEON E. SIMMONS.