Oct. 1, 1946. C. F. OSGOOD 2,408,476

CUTTER CHAIN

Filed March 23, 1942

Fig. 1.

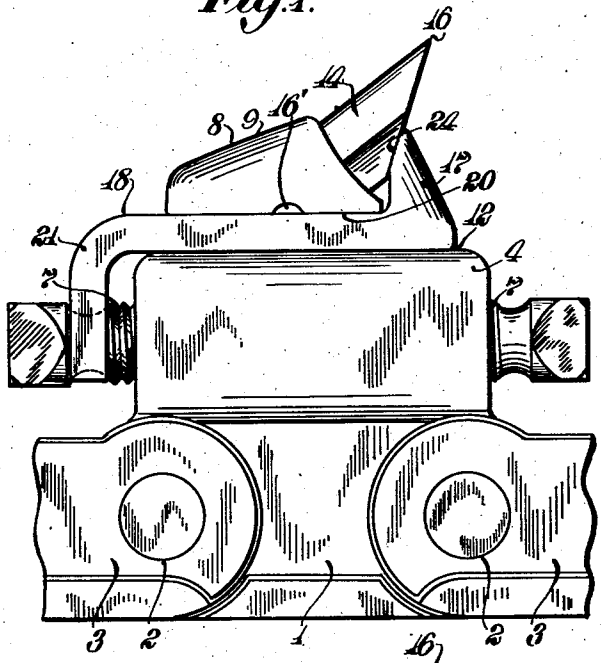


Fig. 2.

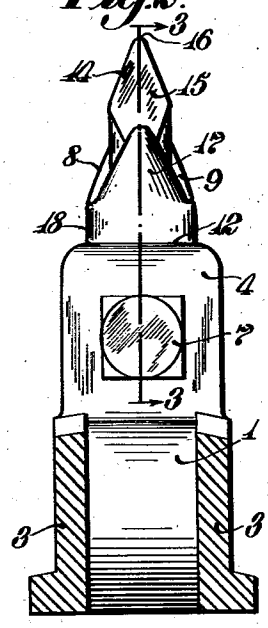


Fig. 3.

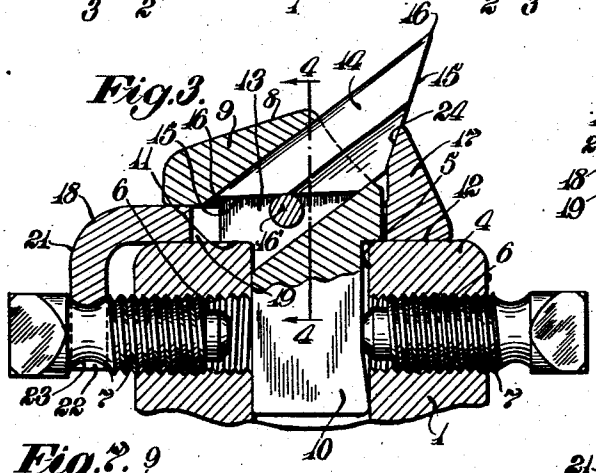


Fig. 4.

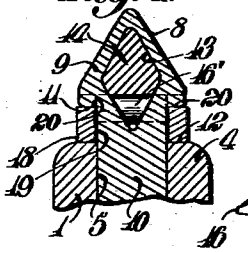


Fig. 5.

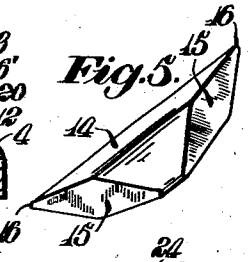


Fig. 6.

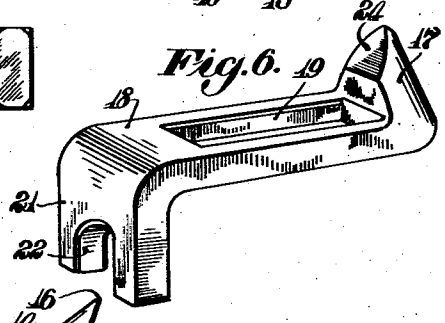


Fig. 7.

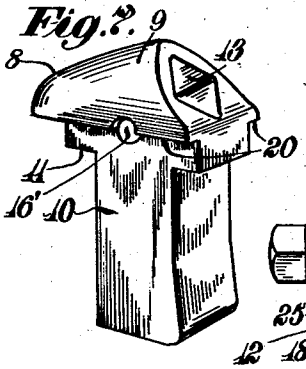
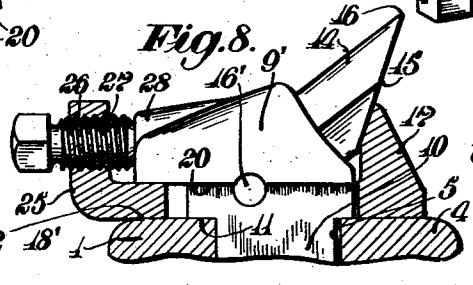


Fig. 8.



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CUTTER CHAIN

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Application March 23, 1942, Serial No. 435,805

7 Claims. (Cl. 262—33)

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This invention relates to cutter chains and more particularly to improvements in holders for cutter bits especially designed for use with the cutter chain of a coal mining machine.

In mining machine cutter chains, it is a well known practice to provide a bit holder having a shank received in the right angle socket of a conventional chain block, and secured in position on the block by a conventional set screw. With many such holders the set screw not only serves to secure the holder shank in the block socket, but also to secure the cutter bit on the holder. With such a construction, in the event the set screw becomes loose during the cutting operation, the cutter bit is not only released from the holder but also the holder is released from the block.

It is the purpose of the present invention to provide a novel bit holding means wherein the means for securing the holder on the chain block is separate and distinct from the means for securing the cutter bit on the holder. With such an improved construction, it is possible to free the cutter bit from the holder without disturbing the relation of the holder with respect to the chain block. This not only enables rapid and easy reversal and replacement of a worn cutter bit but also prevents the release of the holder from the block in the event the securing means for the cutter bit for any reason becomes loose. Further, in such a novel construction the holder may be attached to a chain block of a conventional cutter chain without any change in the parts, and the conventional set screws of the block may serve to hold the cutter bit and holder in position. This not only simplifies the structure of the holder, but also facilitates the attachment of the holder to the chain block.

An object of the present invention is to provide a novel cutter chain. Another object is to provide an improved cutter bit holding means for a cutter chain. Yet another object is to provide improved means for securing a cutter bit to the holder. A further object is to provide novel means for attaching a conventional cutter bit to the chain block of a conventional cutter chain. A still further object is to provide an improved cutter bit holding means wherein the means for securing the cutter bit to the holder is separate and distinct from the means for securing the holder to the chain block. How these and other objects are accomplished, and the advantageous features of the invention, will be best understood from the following detailed description wherein preferred and modified illustrative embodiments

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are set forth, reference for the purpose being had to the accompanying drawing, in which:

Fig. 1 is a fragmentary side elevational view of a cutter chain having a preferred illustrative form of the improved bit holding means associated therewith.

Fig. 2 is a front end elevational view of the cutter chain shown in Fig. 1, with the strap links in cross section.

Fig. 3 is a fragmentary view in longitudinal vertical section taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a detail sectional view taken on line 4—4 of Fig. 3.

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

Fig. 6 is a perspective view of the improved bit clamp.

Fig. 7 is a perspective view of the bit holder.

Fig. 8 is a fragmentary sectional view taken on the plane of Fig. 3, illustrating a modified form of the invention, parts being shown in full to facilitate illustration.

In both illustrative embodiments of the invention, the improved bit holding means is shown associated with a chain block of a conventional cutter chain. It will be evident, however, that the invention may be associated with cutter chains of other types.

The cutter chain disclosed herein comprises a chain block 1 pivotally connected at 2 to strap links 3. The chain block has a lateral lug 4 formed with a conventional right angle socket 5 of generally rectangular cross section. The chain block lug 4 has front and rear threaded openings 6, 6 for the reception of conventional set screws 7, 7 respectively.

In the prefered illustrative embodiment of the invention shown in Figs. 1 to 7 inclusive, the improved bit holding means comprises a holder 8 having a head 9 and an integral shank 10, the latter receivable in the chain block socket 5. The holder head has a plane inner surface 11 which rests on the outer surface 12 of the chain block lug 4. The holder head is formed with an obliquely disposed bit receiving socket 13 for the reception of a cutter bit 14. The cutter bit, which is of a conventional design, is generally diamond shaped in cross section and the socket 13 in the holder head is shaped to conform to the shape of the cutter bit. The cutter bit has oppositely disposed, relatively inclined, elongated plane cutting faces 15, 15 lying in the sides of a triangle and terminating in cutting points 16, 16 at the opposite extremities of the bit. In this construction, secured within the holder head 9 and trav-

ersing the bit receiving socket 13 is an abutment pin 16' against which the inner inactive cutting face 15 of the cutter bit rests. The set screw 7, received in the front set screw opening 6 in the chain block lug, is adjustable to engage the shank 10 of the holder for securing the holder in position on the chain block with the surface 11 on the holder head resting against the exterior surface 12 of the chain block lug. Engaging the inner portion of the active front cutting face 15 of the cutter bit is a front stop 17 of an adjustable clamp 18. This clamp has an elongated central opening 19 which receives the inner portion of the holder head, and the latter has lateral ledges 20, 20 which overlie the sides of the clamp in the manner shown in Fig. 4, so that the clamp straddles the holder in the manner shown. Thus the holder maintains the bit clamp in position on the block. The clamp has at its rearward end a downwardly bent portion 21 which is slotted at 22 to engage the annular grove 23 of the rear set screw 7. The front stop 17 of the clamp has a rearwardly facing, inclined surface 24 against which the forward face of the cutter bit rests, and the active cutting point of the cutter bit projects outwardly and forwardly with respect to the holder and clamp in the manner shown in Fig. 3.

In the modified embodiment of the invention shown in Fig. 8 the clamp 18' has an upwardly bent portion 25 provided with a threaded opening 26 for the reception of a set screw 27. The holder 9' is similar to the holder 8 above described except, in this instance, the rearward portion of the holder head is formed with a projection 28 against which the set screw 27 is adapted to abut. It is accordingly evident that the bit clamp, instead of engaging the rear set screw of the chain block as in the preferred embodiment of the invention, carries a separate set screw which abuts the rear surface of the holder head for adjusting the clamp with respect to the holder. Otherwise, this form of the invention is similar to the preferred embodiment above described.

During assembling of the parts, the holder shank 10 is inserted through the opening 19 in the bit clamp, and the holder shank is then inserted within the chain block socket 5 into the position shown in Fig. 3, with the bit clamp engaging the outer block lug surface. The front set screw 7 is then adjusted to engage the holder shank 10 firmly to secure the holder on the chain block with the inner surface 11 of the holder head resting firmly against the exterior surface 12 of the chain block lug. The cutter bit may then be inserted past the front stop 17 of the then released clamp, into the socket 13 of the holder head with the inner inactive cutting face 15 of the cutter bit resting against the abutment pin 16'. When the cutter bit is in the position shown in Fig. 3, the rear set screw 7 may be adjusted to move the clamp 18 rearwardly with respect to the holder and chain block to bring the surface 24 on the front bit stop 17 in engagement with the inner portion of the active cutting face 15 of the cutter bit, thereby to clamp the cutter bit firmly in cutting position on the holder head. The clamp 18 is held in position between the ledges 20 on the holder head and the exterior surface of the chain block lug, the parts being so formed as to permit free adjustment of the clamp relative to the holder while preventing any appreciable amount of looseness. When it is desired to release the cutter bit from the holder, this may be accomplished simply by adjusting the clamp 18 by means of the rear set screw 7 forwardly relative to the holder and chain block so as to release the surface 24 of the front bit stop 17 from engagement with the cutter bit. When the front bit stop 17 is in its foremost released position, the cutter bit may be withdrawn forwardly from the holder head socket 13 without disturbing the relation of the holder with respect to the chain block. It is accordingly evident that even if the rear set screw 7 becomes slightly loosened so that the clamp is free to move forwardly to permit bit release, the holder shank 10 will still be firmly held in position within the socket of the chain block by the front set screw. Thus the clamp may be released to permit reversal or replacement of the cutter bit quickly and with facility without disturbing the holder at all.

In the modified embodiment of the invention shown in Fig. 8, the holder and clamp are operated in a manner similar to that above described. In this instance, however, instead of engaging the clamp with the rear set screw of the chain block for adjustment by the same, adjustment of the clamp is effected by engagement of the set screw 27 with the projection 28 integral with the holder head. This construction is particularly advantageous when the bit holding means is associated with a cutter chain wherein but one set screw opening, i. e. the front one, is provided on the chain block lug. Otherwise, the manner of use of this form of the invention is similar to that above described.

As a result of this invention, it will be noted that an improved cutter bit holding means is provided whereby a cutter bit may be firmly secured in position on a chain block of a conventional cutter chain. It will further be evident that by the provision of the bit clamp having adjusting means separate and distinct from the securing means for the holder, the cutter bit may be released for reversal or replacement quickly and with facility. It will also be evident that by the provision of the bit clamping means separate and distinct from the securing means of the bit holder, the latter will be firmly held in position on the chain block even when the bit securing means for any reason becomes loose. The bit holder and its associated clamp are also simple and rugged in design. Other uses and advantages of the invention will be clearly apparent to those skilled in the art.

While there are in this application specifically described preferred and modified embodiments which the invention may assume in practice, it will be understood that these embodiments of the same are shown for purposes of illustration and that the invention may be further 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 socket, a bit holder having a shank receivable in the socket of said block, a bit clamp cooperating with said holder and having a longitudinally extending portion resting on an outer surface of said block when the clamp is in operative position, said holder having side portions engaging the sides of the longitudinally extending portion of said clamp for holding said clamp against said block surface and for guiding the latter during adjustment thereof relative to said holder and said block in a direction lengthwise

of said block, means for securing said holder on said block, means separate from said securing means for adjusting said bit clamp longitudinally into bit clamping position relative to said holder and said block, and a cutter bit mounted on said holder and engageable by said bit clamp.

2. The combination with a chain block having a right angle socket and front and rear set screw openings for the reception of set screws and having set screws in said openings, of bit holding means for securing a cutter bit in cutting position on said block including a holder having a head and a shank, said shank receivable in said block socket and the front set screw engageable with said shank for holding the latter in said socket, and a bit stop-providing member cooperating with said holder and engageable by said rear set screw and adjustable by the latter into bit securing position relative to said holder and said block, said holder and said block providing guiding means extending lengthwise of said block for guiding said stop-providing member during adjustment thereof.

3. The combination with a chain block having a right angle socket and front and rear set screw openings for the reception of set screws and having set screws in said openings, of bit holding means for securing a cutter bit in cutting position on said block including a holder having a head and a shank, said shank receivable in said block socket and the front set screw engageable with said shank for holding the latter in said socket, and a bit stop-providing member cooperating with said holder and engageable by said rear set screw and adjustable by the latter into bit securing position relative to said holder and said block, said stop-providing member having an opening for receiving said holder head and the latter cooperating with said block to provide a guide for said stop-providing member during adjustment of the latter, said guide extending lengthwise of said block, and said opening being elongated in the direction of said guide to permit adjustment of said stop-providing member relative to said holder.

4. The combination with a chain block having a socket, of a holder having a head and a shank, said shank receivable in said block socket, means carried by said block for securing said holder shank in said block socket, a bit clamp cooperating with said block and holder, said clamp having an opening for receiving the inner portion of said holder head and the latter engaging said clamp to hold the same against said block, and means separate from said shank securing means for adjusting said bit clamp into bit clamping position relative to said holder and said block,

said holder and said block cooperating to provide means extending lengthwise of said block for guiding said clamp, and said opening being elongated in the direction of said guiding means to permit adjustment of said clamp relative to said holder.

5. The combination with a chain block having a socket, of a holder having a head and a shank, said shank receivable in said block socket, means carried by said block for securing said holder shank in said block socket, a bit clamp cooperating with said block and holder, said clamp having an opening for receiving the inner portion of said holder head and the latter engaging said clamp to hold the same against said block, and the holder cooperating with said block to provide a guideway for said clamp between said holder head and the outer surface of said block, said guideway extending lengthwise of said block, and means separate from said shank securing means for adjusting said bit clamp along said guideway into bit clamping position relative to said holder and said block.

6. The combination with a chain block having a socket, of a bit holder having a head and a shank, said shank receivable in said block socket, means carried by said block for securing said holder shank in said block socket, an adjustable bit clamp arranged between and guided by said holder and block, said holder head engaging said clamp to hold the latter in operative position against the block and said holder and the block cooperating to provide guiding means for the clamp extending lengthwise of the block, and means separate from said shank securing means for adjusting said bit clamp into bit clamping position relative to said holder and said block.

7. The combination with a chain block having a right angle socket and adjustable devices arranged on said block respectively forwardly and rearwardly of said socket, of bit holding means for securing a cutter bit in cutting position on said block including a holder having a head and a shank, said shank receivable in said block socket and said front device engageable with said shank for holding the latter in said socket, and a bit-stop-providing member cooperating with said holder and engageable by said rear device and adjustable by the latter into bit securing position relative to said holder and said block, said holder and said block cooperating to provide guiding means extending lengthwise of said block for guiding said stop-providing member during adjustment thereof into bit clamping position.

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