May 2, 1944. E. J. DOBERSTEIN 2,348,061

CUTTER CHAIN

Filed July 10, 1943

Fig. 1

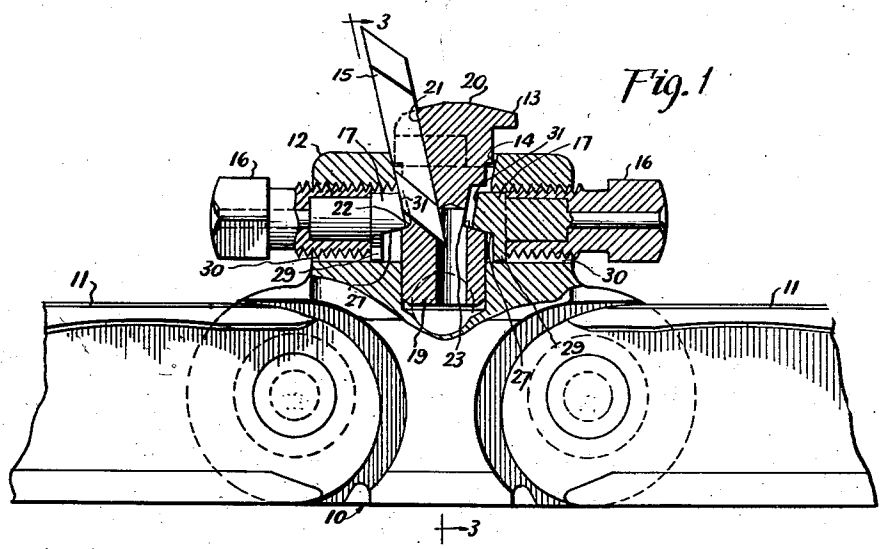


Fig. 2

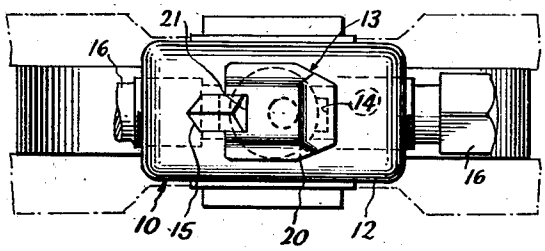


Fig. 3

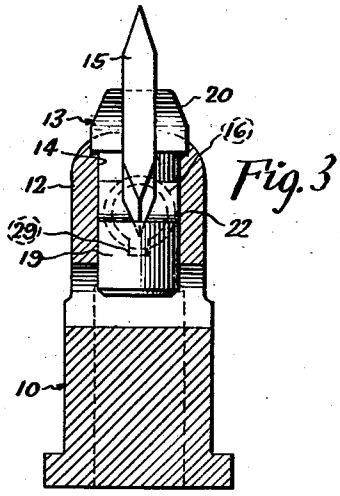


Fig. 4

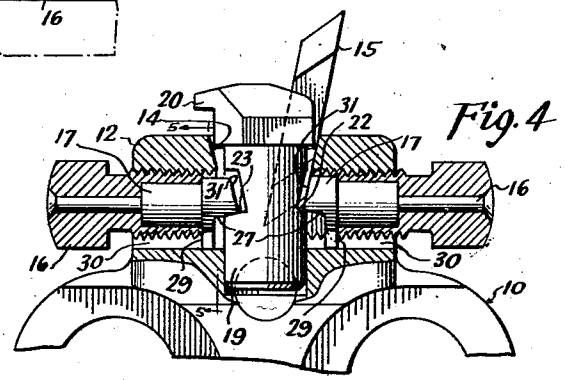


Fig. 5

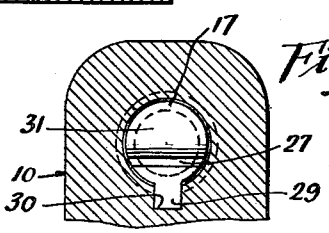
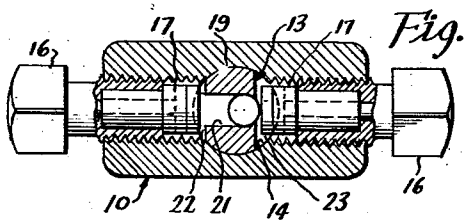


Fig. 6



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CUTTER CHAIN

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Application July 10, 1943, Serial No. 494,162

8 Claims. (Cl. 262—33)

This invention relates to improvements in cutter chains for kerf-cutting machines of the type adapted to cut coal in mines underground and has as its principal objects to provide a novel form of means for detachably holding a cutter bit in a cutter chain block so the chain may readily be adapted for cutting in reverse directions.

Other objects of my invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawing wherein:

Figure 1 is a view in side elevation of a portion of a cutter chain, with certain parts of the bit carrying block shown in longitudinal section in order to illustrate certain details of my invention;

Figure 2 is a plan view of the bit carrying block of the cutter chain shown in Figure 1;

Figure 3 is a transverse sectional view taken substantially along line 3—3 of Figure 1;

Figure 4 is a longitudinal sectional view taken through the bit holding portion of the cutter chain block, showing the bit positioned for cutting in a direction opposite to that shown in Figure 1 and showing certain other details than in Figure 1;

Figure 5 is a fragmentary transverse sectional view taken substantially along line 5—5 of Figure 4; and

Figure 6 is a horizontal sectional view taken through the bit holding portion of the block, showing certain details of the means for clamping the bit holder and cutter bit in position in the block.

The cutter chain shown in the drawing and embodying the principles of my invention may be made up of a series of chain blocks 10, 10 connected together by a series of parallel spaced straps 11, 11. Said chain is driven from a suitable sprocket (not shown) and is guided in a guide channel extending around a cutter bar (not shown) projecting from a kerf-cutting machine, for cutting a kerf in a coal seam as the cutter bar is sumped into the coal face and fed with respect thereto, in a manner well known to those skilled in the art.

The chain block 10 is provided with a projecting bit carrying boss 12 having a bit holder 13, carried in an apertured portion 14 of said boss, extending through the center of said boss. Said bit holder is adapted to receive and clamp a bit 15 in said block, and said bit and bit holder are held in position in said block by means of set screws 16, 16 threaded in opposite ends of said boss. A clamping chamber 17 is rotatably carried by each of said set screws, for engagement with opposite sides of said bit holder.

The cutter bit 15 may be of any type and is preferably of the double ended type known as the throw-away bit, made of flat bar stock, having a substantially uniform rectangular cross section and having opposite ends thereof cut off at an angle to define cutting points.

The bit holder 13 is provided with a shank 19, herein shown as being circular in cross section, which fits in the apertured portion 14 of the boss 12. A head 20 is formed on the outer end of said bit holder and serves to back up and embrace opposite sides of the cutter bit 15, which is mounted in an inclined bit receiving slot 21, formed in said bit holder and extending downwardly through said head and shank. The inner face of said slot is at an angle with respect to the longitudinal axis of said bit holder, to position the point of said bit at the proper angle for cutting, and the lower end of said slot is at an angle parallel to the lower edge of the cutting point of the bit, to form a stop, to limit inward movement of said bit.

The shank 19 of said bit holder is provided with a pair of oppositely disposed recessed portions having inclined lower faces 22 and 23 respectively. Said inclined faces 22 and 23 are adapted to be engaged by corresponding inclined faces 27, 27 of the clamping members 17, 17, so said clamping members will move said bit holder into the block and hold said bit holder and cutter bit therein, as they are moved towards said bit holder by their respective set screws. Said clamping members are each provided with a depending lug 29, which is adapted to engage a keyway 30 cut in the threaded aperture for the respective set screw 16, to hold said clamping members from rotation during tightening or loosening of said set screws. Each clamping member is also provided with an inclined engaging face 31, inclined at the angle of the advance face of the cutter bit when in a cutting position, the engaging face of the advance clamping member being adapted to engage the advance lower portion of the cutter bit and to serve as an abutment therefor.

When it is desired to hold the cutter bit in position for cutting, it is placed in the bit receiving slot 21 formed in the bit holder 13 until its inner end engages the lower end of said bit receiving slot. The advance set screw 16 is then turned so that the inclined engaging face 27 of the clamping member 17 comes into engagement with the inclined surface 22 of the bit holder and so that its advance engaging face 31 comes

into engagement with the lower advance portion of the bit 15. The opposite set screw 16 is then tightened, to engage the engaging face 27 with the inclined face 23 of said bit holder, and to move said bit holder into said boss by the wedging action obtained by rectilinearly moving the inclined surface 27 along the correspondingly inclined clamping surface 23, to firmly clamp said bit holder and the cutter bit in the bit holding boss of said cutter chain.

When it is desired to reverse the direction of cutting, it is simply necessary to back out the two set screws 16, 16 to a point where the bit may be removed from the bit holder, and turn the bit holder 180 degrees in its bit receiving aperture 14. The bit may then be replaced and the advance set screw 16 may then be advanced into the bit receiving boss 12 to a position so that the face 31 of its clamping member 17 abuts the lower portion of the advance face of the bit. The opposite set screw is then turned in a direction to engage its engaging face 27 with the engaging face 23 of the recessed portion of said bit holder, to firmly clamp said bit holder and bit in position in the block.

It may be seen from the foregoing that a simplified form of bit holder has been provided, for securely holding a detachable bit in a cutter chain, which may readily be adapted for cutting in reverse directions, and which is clamped in the chain in such a manner that it cannot be thrown from the chain block during cutting.

While I have herein shown and described one form in which my invention may be embodied, it will be understood that the construction thereof and the arrangement of the various parts may be altered without departing from the spirit and scope thereof. Furthermore, I do not wish to be construed as limiting my invention to the specific embodiment illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a reversible cutter chain and in combination with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to receive a cutter bit, and having a pair of oppositely disposed transversely extending recessed portions having engaging surfaces inclined upwardly from the outer sides thereof, and clamping means slidably mounted in said block and adapted to be moved into engagement with said inclined surfaces of said recessed portions, for clamping said bit holder and cutter bit within said block.

2. In a reversible cutter chain and in combination with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to receive a cutter chain bit, and having a pair of oppositely disposed recessed portions having lower plane surfaces inclined upwardly from the outer sides thereof, clamping means slidably mounted within said block on opposite sides of said bit holder, and adapted to engage said inclined surfaces, for holding said bit holder and bit within said block, said clamping means in the advance portion of said block also being adapted to engage the lower portion of an advance face of the cutter bit.

3. In a reversible cutter chain and in combination with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to embrace the sides and rear surface of a cutter bit, and having a pair of oppositely disposed transversely extending inclined engaging surfaces, a set screw threaded in each end of said block for movement towards said bit holder, and a separate clamping member projecting from the inner end of and rotatably carried by each of said set screws, each of said clamping members having an inclined face adapted to engage one of said transversely extending engaging surfaces, for moving said bit holder into said block with a wedging action and for holding said bit holder and cutter bit therein.

4. In a reversible cutter chain and in combination with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to receive a cutter bit, and having a pair of oppositely disposed transversely extending inclined engaging surfaces, a set screw threaded in each end of said block for movement towards said bit holder, and a separate clamping member projecting from the inner end of and rotatably carried by each of said set screws, each of said clamping members having an inclined face adapted to engage one of said transversely extending engaging surfaces, for moving said bit holder into said block with a wedging action and for holding said bit holder and cutter bit therein, each of said clamping members having a surface inclined at the angle of the cutter bit, and the advance of said clamping members being adapted to engage the lower end of the cutter bit, to form an abutment therefor.

5. In a reversible cutter chain and in combination with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to embrace the sides and rear surface of a cutter bit, and having a pair of oppositely disposed transversely extending inclined engaging surfaces, a set screw threaded in each end of said block for movement towards said bit holder, and a separate clamping member projecting from the inner end of and rotatably carried by each of said set screws, each of said clamping members having an inclined face adapted to engage one of said transversely extending surfaces, for moving said bit holder into said block with a wedging action and for holding said bit holder and cutter bit therein, and means for holding said clamping members from rotation during turning movement of said set screws.

6. In a reversible cutter chain and in combination with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to embrace the sides and rear surface of a cutter bit, and having a pair of oppositely disposed transversely extending inclined engaging surfaces, a set screw threaded in each end of said block for movement towards said bit holder, and a separate clamping member projecting from the inner end of and rotatably carried by each of said set screws, each of said clamping members having an inclined face adapted to engage one of said transversely extending surfaces, for moving said bit holder into said block with a wedging action and for holding said bit holder and cutter bit therein, and each of said clamping members having a projecting lug adapted to engage a keyway formed in said block, to hold said clamping members from rotation during turning movement of said set screws.

7. In a reversible cutter chain and in combina-

tion with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to embrace the sides and rear surface of a cutter bit, and having a pair of oppositely disposed transversely extending recessed engaging surfaces, inclined upwardly towards the center thereof, a set screw threaded in each end of said block for movement towards said bit holder, a separate clamping member rotatably carried by each of said set screws, each of said clamping members having an inclined face adapted to engage one of said transversely extending surfaces, for moving said bit holder into said block with a wedging action and for holding said bit holder and cutter bit therein, each of said clamping members having a surface inclined at the angle of the cutter bit and the advance of said clamping members being adapted to engage the lower advance portion of the cutter bit, to form an abutment therefor, and means for holding said clamping members from rotation during turning movement of said set screws.

8. In a reversible cutter chain and in combination with a bit carrying chain block, a bit holder adapted to fit in an apertured portion of said chain block, said bit holder having a forward slotted portion adapted to embrace the sides and rear surface of a cutter bit, and having a pair of oppositely disposed transversely extending recessed engaging surfaces, inclined upwardly towards the center thereof, a set screw threaded in each end of said block for movement towards said bit holder, and a separate clamping member rotatably carried by each of said set screws, each of said clamping members having an inclined face adapted to engage one of said transversely extending surfaces, for moving said bit holder into said block with a wedging action and for holding said bit holder and cutter bit therein, each of said clamping members having a surface inclined at the angle of the cutter bit and the advance of said clamping members being adapted to engage the lower advance portion of the cutter bit, to form an abutment therefor, and means for holding said clamping members from rotation during rotation of said set screws including a lug projecting from each clamping member, adapted to engage a keyway formed in said block.

EDWARD J. DOBERSTEIN.