June 17, 1941. S. VAN ETTEN 2,246,225

CUTTING CHAIN

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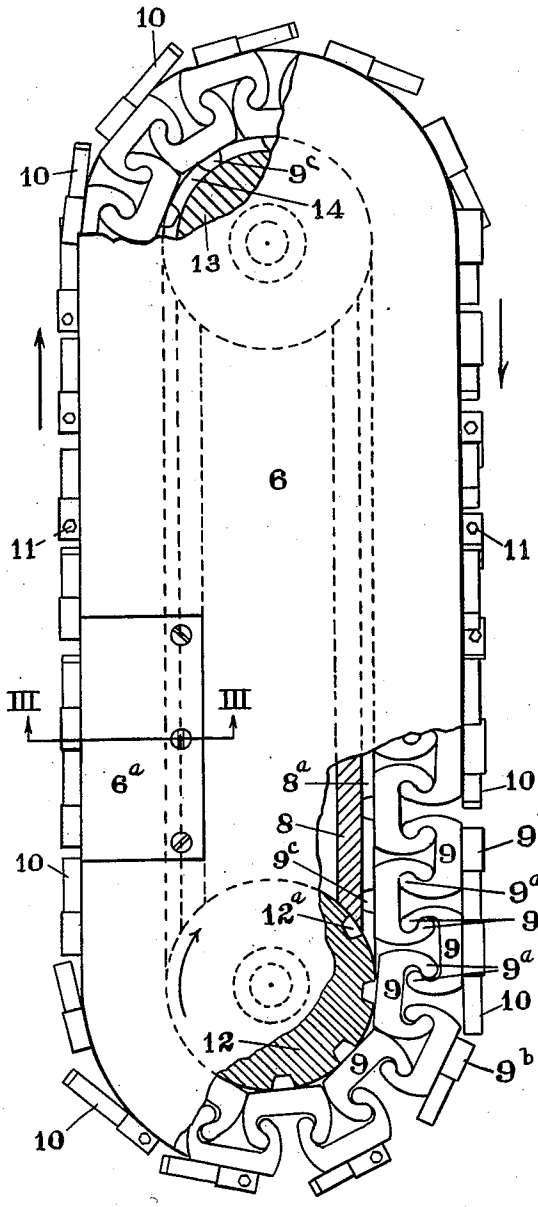


Fig. 1.

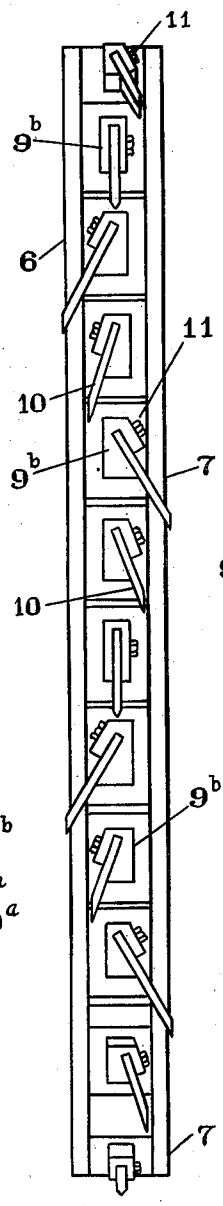


Fig. 2.

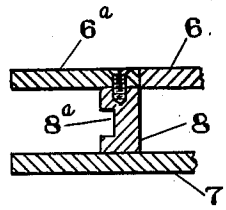


Fig. 3.

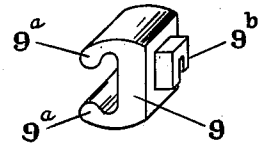


Fig. 4.

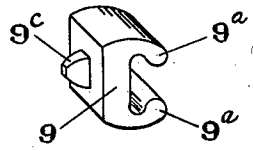


Fig. 5.

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CUTTING CHAIN

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Application June 22, 1940, Serial No. 341,872

5 Claims. (Cl. 262—28)

This invention relates to coal mining machines of the type employing a power driven chain provided with steel coal cutting bits.

In mining coal with a cutting chain as now commonly employed the kerf or cut made in the wall of coal is of such width as to produce a wasteful quantity of dust and other fine portions not salable at a profitable price. The result is due to the form or construction of the links carrying the cutting bits. Such links are composed of numerous parts hinged together with hinging pins and they are not only likely to get out of order but their upkeep is expensive and time-consuming.

It is therefore an object of my invention to provide a cutting chain, the links of which are simple parts and of narrow dimension in the line of their travel and that can be inexpensively manufactured. By reason of the relatively narrow dimension of links the wide and heavily wasteful cut of the former construction of chains is avoided. Another object of the invention is to make the links of such forms that they can be easily assembled and disassembled by a mere sliding lateral movement of the links in relation to each other. Other objects will appear herein.

The invention is embodied in the example herein shown and described, the features of novelty being pointed out in the claim.

In the accompanying drawing—

Figure 1 is a plan view of the cutting device with parts broken out to illustrate details.

Fig. 2 is an edge view of the cutting device showing the various positions of the cutting bits.

Fig. 3 is a detail cross section on the line III—III Fig. 1.

Fig. 4 is a detail view in perspective of one of the outer or tool-carrying links of the cutting chain.

Fig. 5 is a detail view in perspective of one of the inner links of said chain.

The chain carrying and operating means includes a metallic top plate 6 and a bottom plate 7 of suitable gage and length and of substantially identical outline in the cutting margin with the parallel edges terminating in semi-circular end portions. These plates 6 and 7 are spaced parallelly apart and have secured between them an inset circumambient beam 8 to form a uniform channel around the rim of the carrier for the travel of the cutting chain. The beam 8 is formed with a groove 8^a for the travel of lugs shown on the inner links of the chain. The beam 8 can be welded or otherwise secured to the said plates 6 and 7 but a sufficient portion of the top plate 6, as shown at 6^a, is made removable so that the cutting chain can be exposed conveniently to permit the removal of one or more of the links there exposed for repair and replacement or for substitution of a fresh one.

The links as shown in the drawing are formed to provide a body 9 having at the ends thereof a leg 9^a of hook form bent toward each other, the dimensions of said legs being preferably such that the space between the legs of one link at one side of the chain is adapted to receive the legs of two links of similar form to effect the concatenation. It is desirable that the connection between the links shall be effected by merely sliding them laterally together. The form and spacing of the legs 9^a is such that the resulting chain shall have flexing action substantially as depicted in Fig. 1. It is important that the hooking character of the links shall be such as to preclude the escape from the inner links of the outer or bit containing links.

Formed on the body portion 9 of the outer links are appropriate projections 9^b having chucks or sockets into which the shanks of the coal cutting bits 10 can be seated and removably held by set screws 11. The said bits are shown in the successive series as projecting in suitably different directions so as to cut the coal in different lines in making the kerf or channel.

The chain thus constructed is driven by a power driven wheel at 12 having sockets 12^a to engage the lugs 9^c on the inner series of links, and around an idler wheel at 13 which latter is provided with an annular groove 14 coinciding with the groove 8^a, and into which, the lugs 9^c project as the chain is drawn by the operation of the power wheel.

The cutting apparatus can be supported upon ordinary or suitable means for moving it to enter and advance through the wall to be cut. When a wall of coal is cut with the apparatus to the extent desired it is "shot" with powder or other explosive to throw the coal down.

The operation is this: Power is applied to the drive wheel 12 to cause the chain to travel in the direction indicated by the arrows adjacent thereto in Fig. 1 and when thus driven, the frame carrying the chain can be advanced endwise into the wall and then laterally by suitable supporting and driving means.

Because of the narrow width of the chain thus constructed, the kerf cut and coal removed can be half or less than half of that cut and removed by the coal cutting chains now in common use.

The forms of the parts can be changed without departing from the invention as claimed.

What I claim is:

1. In a cutting means of the kind described including a chain composed of links having interengaging laterally separable legs, guiding means for the travel of said chain adapted to prevent separation of said links in operation, said guiding means including a removable portion permitting repair access to one or more of said links.

2. A cutting chain of the kind described including a series of inner link members and a series of outer link members, the body portions of each of the said link members being substantially of block-like form and having at its opposite ends on one face thereof a leg extending transverse of the operating direction of movement of the chain, said legs on each link being of hook form, curved toward the other, and said legs on each link of each series being spaced apart to receive between them one leg of two links of the opposite series to effect the concatenation.

3. A cutting chain of the kind described including a series of inner link members and a series of outer link members, the body portions of each of said link members being of substantially of block-like form and having at its opposite ends on one face thereof a leg extending transverse the operating direction of motion of the chain, said legs on each link being of hook form curved toward the other, and said legs on each link of each series being spaced apart to receive between them one leg of two links of the opposite series to effect the concatenation, said links being separable after concatenation by sidewise movement of a link in a direction transverse the direction of the motion of the cutting chain.

4. A cutting chain of the kind described including a series of inner link members and a series of outer link members, the body portions of each of said link members being substantially of block-like form and having at its opposite ends on one face thereof a leg extending transverse the operating direction of motion of the chain, said legs on each link being of hook form curved toward the other, said legs on each link of each series being spaced apart to receive between them one leg of two links of the opposite series to effect the concatenation and guiding means for the travel of said chain constructed to prevent separation of said links in operation.

5. A cutting chain of the kind described including a series of inner link members having means thereon whereby they may be power driven, and a series of outer cutting tool carrying link members, the body portions of each of said link members being substantially of block-like form and having at each of its opposite ends a leg curved toward the other, said legs on each link being spaced apart to receive between them two links of the opposite series to effect the concatenation.

SCOTT VAN ETTEN.