Oct. 13, 1953 L. G. ROLLINS 2,655,362

CHAIN GUIDE FOR DISINTEGRATING APPARATUS

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Fig. 1.

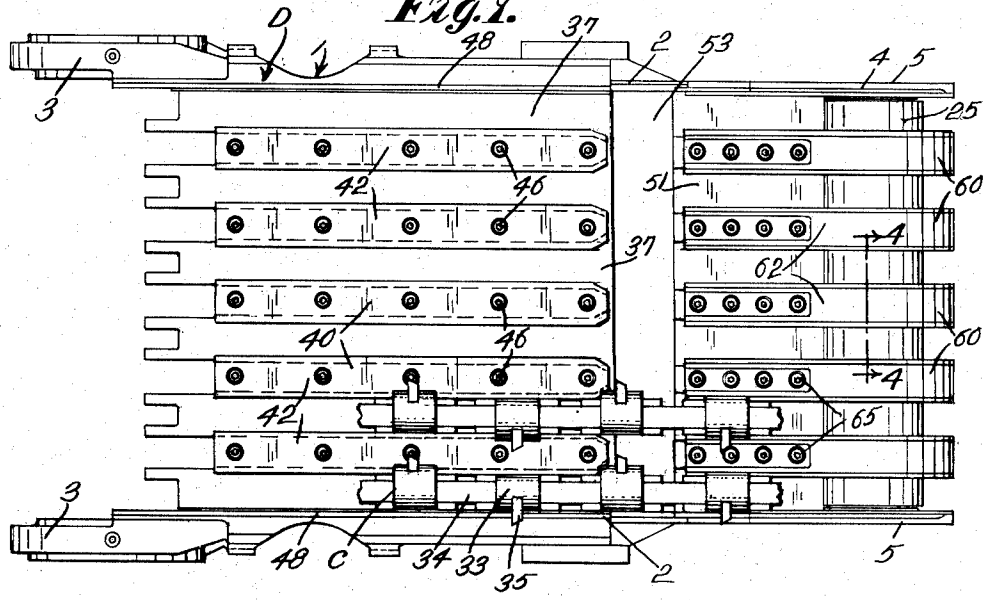


Fig. 2.

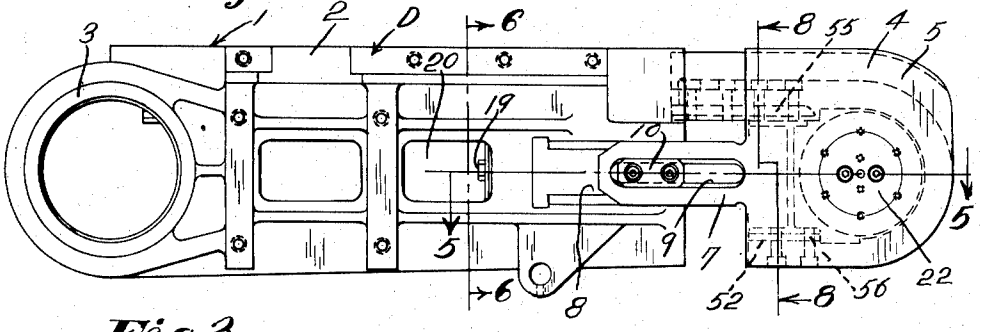


Fig. 3.

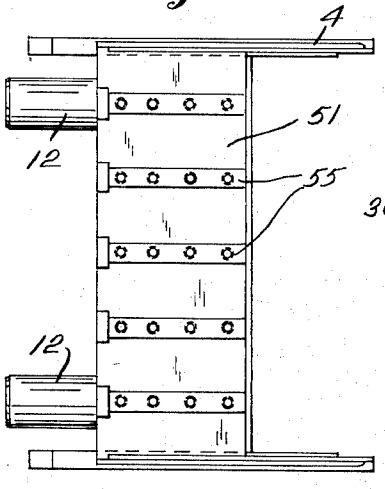


Fig. 4.

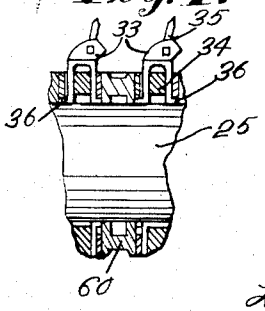
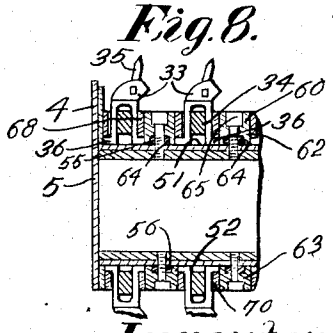


Fig. 8.



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Fig. 5.

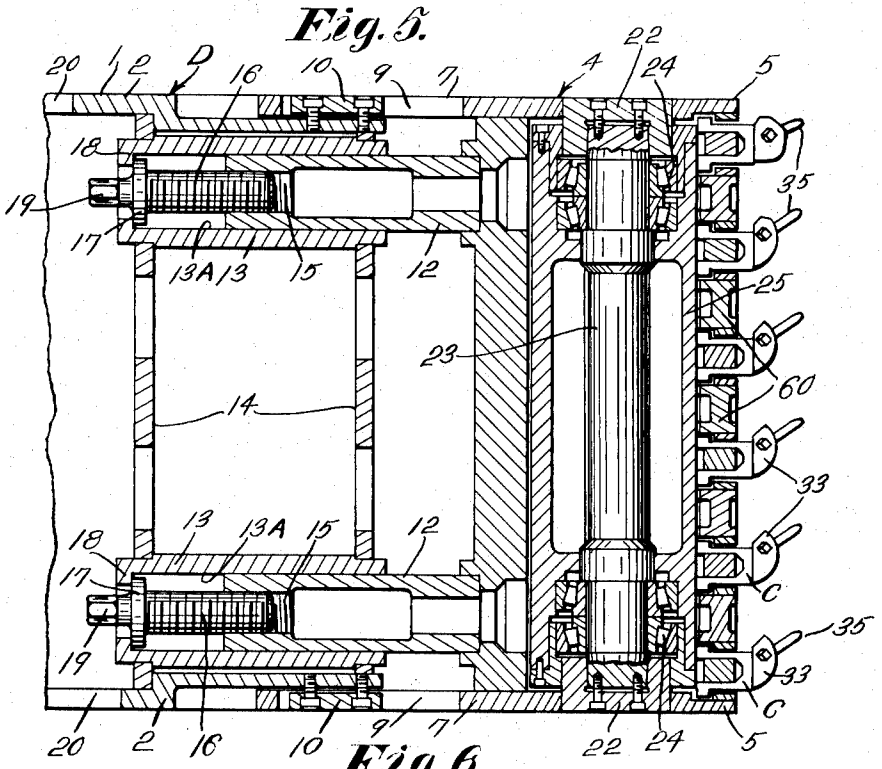


Fig. 6.

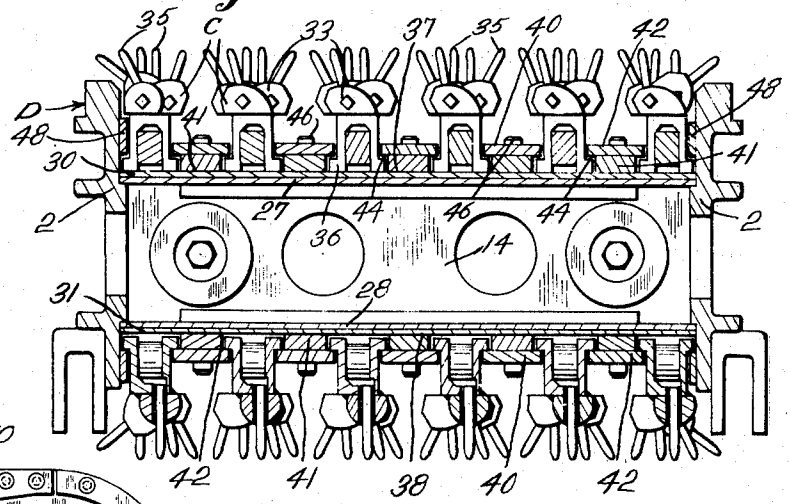
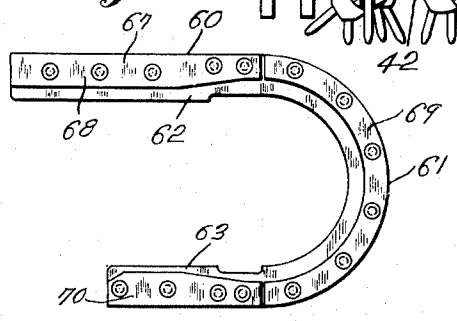


Fig. 7.



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CHAIN GUIDE FOR DISINTEGRATING APPARATUS

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Application June 27, 1950, Serial No. 170,639

3 Claims. (Cl. 262—28)

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This invention relates to disintegrating apparatus, and more particularly to the disintegrating apparatus of continuous miners.

Continuous miners, in a well-known form, are provided with disintegrating (material attacking and disintegrating) apparatus or mechanisms which include elongated, relatively wide, vertically movable frames about which a plurality of disintegrating element-carrying chains are circulated in like orbits. At the forward ends of the frames there are idler rollers for the support of the chains. Guiding and separating means for the chains as they pass around the idler rollers are provided, and it is to this portion of disintegrating mechanisms or apparatus that the invention particularly relates.

An object of the invention is to provide an improved disintegrating apparatus. Another object is to provide an improved disintegrating apparatus of the multiple chain type, having improved chain separating, restraining and guiding arrangements. A further object is to provide an improved guide and spacer element for the chains of disintegrating apparatus. Other objects and advantages of the invention will hereinafter appear.

In the accompanying drawings, in which there is shown one illustrative embodiment which the invention may assume in practice:

Fig. 1 is a top view of a disintegrating apparatus in which the invention is incorporated in its illustrative form, the disintegrating chains being omitted except for fragments of two of the same.

Fig. 2 is a side elevational view of the structure shown in Fig. 1, no portions of the disintegrating chains being shown in this figure.

Fig. 3 is a top view of the forward frame member of the disintegrating apparatus, the idler roller for the chains being omitted.

Fig. 4 is a fragmentary sectional view on the plane of the line 4—4 of Fig. 1, the disintegrating chains being shown in this view but in a different position relative to the bar structure.

Fig. 5 is a horizontal section on the plane of line 5—5 of Fig. 2, the disintegrating chains being shown in this view.

Fig. 6 is a vertical transverse section on the plane of the line 6—6 of Fig. 2, the disintegrating chains being shown in this view.

Fig. 7 is a side elevational view of a chain guide and spacer element.

Fig. 8 is a vertical transverse section on the planes of the line 8—8 of Fig. 2, the disintegrating chains being shown in this view but in a different position relative to the bar structure.

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The disintegrating mechanism shown, and generally designated D, is adapted to be used as a part of a Continuous Miner of the type shown in the application of John R. Sibley, Serial No. 102,996, filed July 5, 1949 for Apparatus for Continuous Mining. It includes a rearward frame member 1 of built-up construction and having side plates 2 terminating in eye portions 3 which are adapted to be mounted, as shown in said Sibley application, upon journal surfaces provided on a reciprocating frame (not shown here) which is advanced and retracted as sumping and withdrawing take place.

The rearward frame member 1, having side plates 2, supports, in adjustable relationship to it, an outer or forward idler roller-supporting member 4, having side plates 5 which, at their outer sides, desirably lie flush with the side plates 2 of the rearward frame member 1. The side plates 5 of the adjustable idler roller-supporting member are provided with rearward guides 7 received in longitudinal guiding slots 8 in the sides of the rearward side plates 2. The guides 7 have longitudinal slots 9 which are engaged by retaining blocks 10 secured, as by screws, to the forward ends of the side plates 2 of the rearward frame member 1. The adjustable idler roller-supporting member 4 has parallel tubular elements 12 secured to its rearward or inner side, and slidingly received in parallel longitudinal tubular guides 13 secured to transverse plates 14, which rigidly brace the forward ends of the side plates 2 of the rearward frame member 1. The tubular guides 13 are preferably welded to the transverse plates 14, and have parallel bores 13A in which the tubular elements 12 are received. The tubular elements 12 have threaded portions 15 engaged by adjusting screws 16, and the screws have collars 17 engaging inwardly directed flanges 18 on the rearward ends of the tubular guides 13. The screws have polygonal portions 19 which are accessible through side openings 20 in the side plates 2, and are engageable by suitable turning instruments, such as a wrench.

Supported within end supports 22 secured to the side frames 5 of the idler roller supporting member 4 is a transverse shaft 23 which supports bearings 24 on which an elongated idler roll 25 is journaled.

Endless disintegrating chains C are guided by the idler roller 25 as they pass around the outer end of the swingable bar structure 1. By suitably adjusting the screws 16, the adjustable frame or idler roller-supporting member 4 may be adjusted outwardly along its guides relative

to the rear frame member to vary the tension of the chains.

The swingable structure D comprises parallel upper and lower transverse plates 27, 28, rigidly held in spaced relation by a series of perpendicular transverse bracing plates of which the only ones shown are the plates 14. The transverse bracing plates may be welded to the upper and lower plates 27 and 28 to provide a rigid unitary structure. Detachably secured, as by bolts, to the outer surface of the upper and lower plates 27 and 28 are outer plates 30 and 31.

There are shown in the drawings six disintegrating chains C, each composed of disintegrating element-carrying blocks 33 and connecting links 34, the blocks 33 each carrying a disintegrating element 35 and each having guide flanges or gibs 36.

Extending along upper and lower surfaces 37 and 38 of the structure 1 are guide structures 40, each herein shown as including a narrower strip or bar element 41 adjacent one of the surfaces mentioned, and a wider outer strip 42 projecting out from the opposite sides of the elements 41 and spaced from the surfaces 37 or 38 as the case may be, with which they are respectively associated, thus providing grooves 44 for receiving the side flanges or gibs 36. The widths of the elements 41 and strips 42, which are held togther and to the frame structure 1 as by screws 46, are such as to provide the desired spacings between adjacent chains. The outer gibs on the side chains are held down by strips 48 secured to the side plates 2, 2.

The forward idler roller-supporting frame has upper and lower surfaces 51 and 52 thereon which lie in planes tangent to the idler roller and which are in the same planes with the upper and lower surfaces 37 and 38 respectively of the rearward frame member 1. The frame portion on which the surface 51 is formed extends further toward the pivot of the disintegrating apparatus than does the portion on which the surface 52 is formed, and the first mentioned one of these portions overlaps with a surface 53 on the frame 1 to prevent disintegrated materials dropping through between the two frames which constitute the supports and guides for the disintegrating chains C. Each of the surfaces 51 and 52 has secured to it positioning strips or ribs, those secured to the surface 51 being numbered 55 and the others being numbered 56. These strips are in line with the strips 41 and 42 secured to the frame member 1.

To guide the chains C around the idler roller, there are provided guide and spacer elements 60. These include substantially semicircular portions 61 and parallel portions 62 and 63, which extend substantially tangentially with respect to the portions 61. These members are grooved as at 64 along the inner sides (the mutually adjacent sides) of their parallel portions 62 and 63, and thus are adapted to fit over the strips 55 and 56 and to be positioned by them laterally. The strips 55 and 56 and the walls of the grooves 64 are machined to provide good fitting. Threaded elements 65 pass through the portions 62 and 63 and the strips 55 and 56 to hold the elements 60 in position. The elements 60 are provided at their opposite sides with guide and wear strips 67, these being shown as made in three pieces, a portion 68 secured to the sides of the longer tangential portion 62, an arcuate portion 69 secured to the arcuate portion 61, and a shorter portion 70 secured to the shorter tangential portion 63. These strips cooperate with the flanges or gibs 36 on the disintegrating element supporting blocks 33 and restrain and guide the latter as they approach, pass around, and move rearwardly from the idler roller.

It will be understood that the structure described provides for the effective guiding of the disintegrating chains, that the guiding means are located positively in the desired positions, that the number of parts employed is minimized and that the arcuate portions 61 of the guiding devices may be located wholly out of contact with the guide roller and yet be securely held in position. A further very important advantage is that the members 60, through the connections 55, 64, and 56, 64 which constitute interlocking connections, are prevented from shearing their holding screws, with the result that a much stronger and more durable structure is provided.

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.

What I claim as new and desire to secure by Letters Patent is:

1. In a disintegrating apparatus, in combination, a bar structure having at the forward end thereof an elongated rotatably supported idler roller and having upper and lower chain guiding surfaces in planes tangent to said roller, chain guides for disintegrating chains which include bit-carrying blocks having lateral surfaces and oppositely projecting flanges, each of said guides including a forward arcuate portion and rearwardly extending parallel portions, and means for securing said rearwardly extending parallel portions against lateral displacement relative to said upper and lower chain guiding surfaces and to position said forward arcuate portion in coaxial relation with said roller including spaced parallel ribs on said chain guiding surfaces, grooves in said chain guides to fit over said ribs and thereby laterally fix and space said guides with respect to each other and threaded holding elements extending through said chain guides between the sides of the grooves therein, said chain guides having on their laterally opposite faces portions spaced from said chain guiding surfaces and having lateral and inner surfaces to coact with the lateral surfaces and oppositely projecting flanges respectively on the chain blocks.

2. In a disintegrating apparatus, in combination, a disintegrating bar structure including a rearward, pivotally supportable frame member and a forward idler roller supporting member for supporting an idler roller, means for securing said members together in longitudinal alinement, each of said members having an upper chain guiding surface and said forward member having a lower chain guiding surface, said surfaces in planes tangent to a cylinder of the diameter of an idler roller which said forward idler supporting member is adapted to support, parallel chain guides on the upper chain guiding surface of said rearward member, guide ribs on the upper chain guiding surface of said forward member, and a plurality of arcuate chain guides each having a guide portion extending tangentially with respect to the arc thereof, and means for holding said guide portions against lateral dis-

placement relative to said chain guiding surfaces including grooves one between the sides of each of said guide portions and each receiving one of said ribs.

3. As an article of manufacture, a unitary guide and spacer element for arrangement between disintegrating chains which include bit-carrying blocks having lateral surfaces and oppositely projecting flanges, said element including an arcuate portion and parallel tangential portions, said parallel tangential portions grooved longitudinally in their mutually adjacent faces to provide recesses adapted for engagement with positioning ribs on a bar structure on which the chains are guided, and said arcuate portion and said parallel tangential portions having secured to their lateral surfaces and in spaced relation to their inner sides wear plates for engagement with the lateral surfaces and with the flanges of the bit-carrying chain blocks.

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