

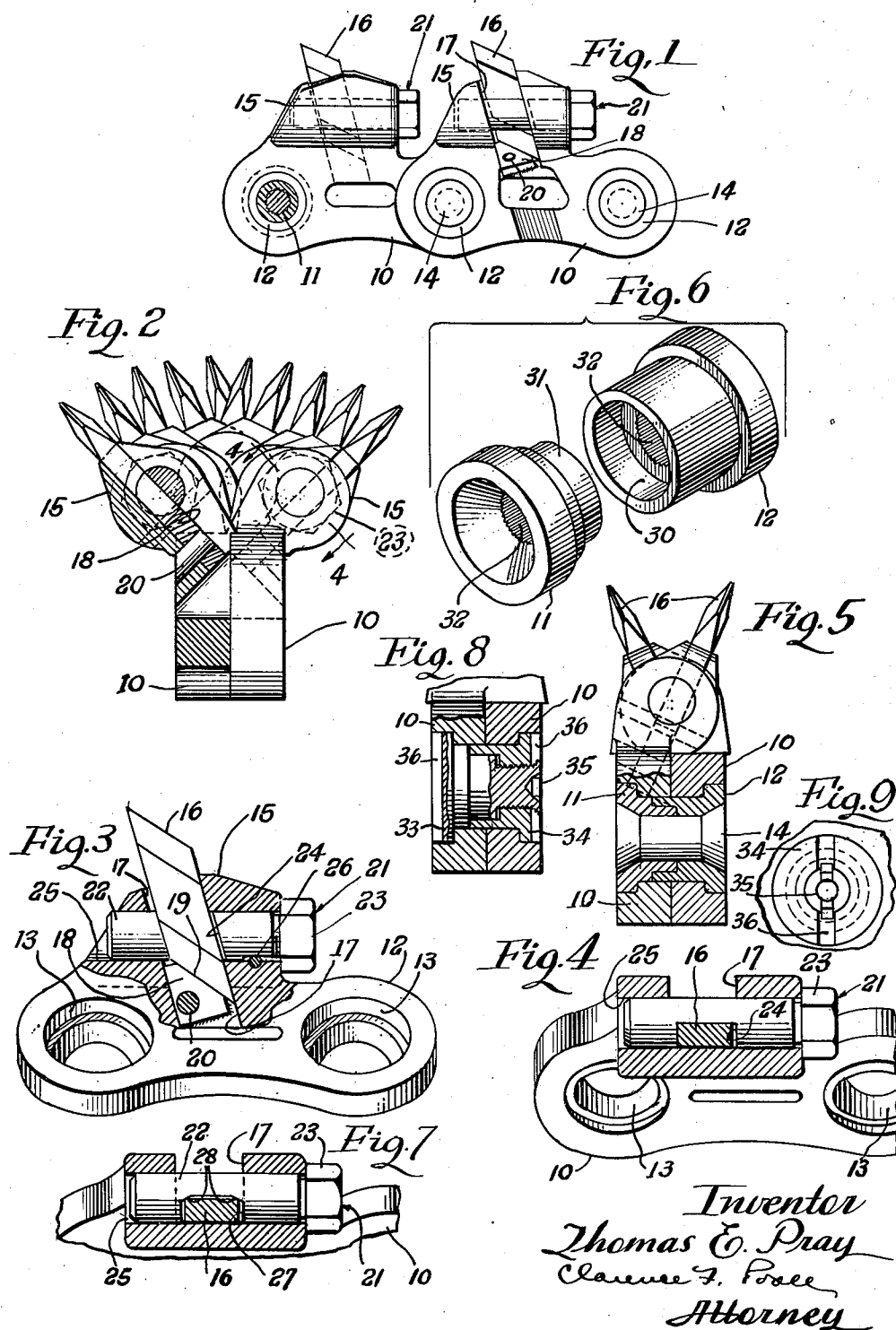
March 11, 1941.

T. E. PRAY

2,234,449

CUTTER CHAIN

Filed July 20, 1938



Inventor
 Thomas E. Pray
 Clarence F. Foose
 Attorney

UNITED STATES PATENT OFFICE

2,234,449

CUTTER CHAIN

Thomas E. Pray, Chicago, Ill., assignor to Goodman Manufacturing Company, Chicago, Ill., a corporation of Illinois

Application July 20, 1938, Serial No. 220,165

5 Claims. (Cl. 74-254)

This invention relates to improvements in cutter chains for mining machines.

Among the objects of the invention are to provide a self-cleaning strapless cutter chain of a simple and durable construction.

Another object of my invention is to provide an improved means for detachably holding a cutter chain bit of the throw away type in the chain block, which is so arranged as to firmly hold the bit in position in the block and to permit ready removal of the bit without binding.

Still another object of my invention is to provide an improved pivotal bearing connection between adjacent links of the cutter chain, arranged to provide a relatively large pivotal bearing area for the links of the chain, and to prevent spreading of the links with respect to each other.

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

Figure 1 is a view in side elevation of two interconnected links of a cutter chain constructed in accordance with my invention;

Figure 2 is an end view of a cutter chain constructed in accordance with my invention with certain parts of one of the links shown in transverse section;

Figure 3 is a fragmentary longitudinal sectional view taken through one of the links of the chain, showing certain details of the clamping means for the bits;

Figure 4 is a sectional view taken substantially along line 4-4 of Fig. 2;

Figure 5 is an end view of a pair of cutter chain links with certain parts shown in transverse section in order to show the details of the connection between the links;

Figure 6 is an enlarged detail isometric view showing the bearings which connect the cutter chain links together;

Figure 7 is a view somewhat similar to Fig. 4, showing a modified form of construction of clamping stud for the cutter chain bits;

Figure 8 is a transverse sectional view of a pair of links of the cutter chain, showing a modified form of bearing connection between the links; and

Figure 9 is a detail side view showing certain details of the modified connection between the links not shown in Fig. 8.

Referring now in particular to the drawing, illustrating one form in which my invention may

be embodied, the cutter chain shown is of the endless type and includes a plurality of links 10, 10 pivotally connected together by means of a pair of interlocked flanged bearing members 11 and 12. Said bearing members fit in shouldered apertures 13, 13 formed in said links, and as is shown in Figure 5, are secured together by means of rivets 14, 14. The detailed form of construction of said bearing members will hereinafter be more clearly described as this specification proceeds.

The cutter chain is adapted to be guided in a channeled groove formed about a cutter bar (not shown) and said chain, as herein shown, is of the gibless type; that is, no means is provided for retaining the chain in the channeled guide formed in the cutter bar except the tension of the chain itself.

The links 10, 10 are pivotally connected together in staggered or offset relation with respect to each other; that is, when the chain is arranged to cut in a horizontal plane, one link has two other links abutting its upper surface and pivotally connected to opposite ends thereof by the bearing members 11 and 12 and rivets 14. These adjoining links, in a like manner, have their under surfaces abutted by corresponding chain links and pivotally connected together in the aforementioned manner, leaving a space in the channelled guide of the cutter bar between alternate links to enable the chain to clear debris from the cutter bar.

Each link 10, 10 is provided with an integrally formed bit holding lug or block 15 on the outer end thereof, which forms a means for holding a cutter bit 16. As herein shown, the cutter bit 16 is relatively short and is so formed that each of its ends defines a cutting point so that it may be reversed when one end thereof is dull, and thrown away when both ends are dull.

Each bit holding block 15 projects outwardly from the center of the respective link 10 at an angle which varies with respect to the plane of travel of the chain, as may clearly be seen with reference to Fig. 2, to hold the cutter bits in various angular positions with respect to each other throughout the chain and arrange said bits to completely cut a kerf or groove in the coal face, of sufficient width to clear the cutter bar about which the chain travels.

Each block 15, as herein shown, is provided with a bit receiving slot or recess 17 extending outwardly therealong in an angular forward direction with respect to the direction of travel of

the blocks. A stop 18 is provided in each slot 17 adjacent the lower end thereof. Said stop is provided with an inclined engaging face 19 for engaging the lower end of the bit and is herein shown as being secured in said slot by means of a pin 20.

A clamping member 21 is provided for securing each bit 16 in its respective block, which includes a stud 22 having a nut 23 threaded in the outer end thereof. Said stud is provided with a bit receiving slot 24 offset from the center of said stud and open to one side thereof, and is somewhat similar to that shown in my prior Patent No. 1,472,736 which issued Oct. 30, 1923, with the exception that the bit receiving slot in my prior patent extends through the center of the stud and is not open towards one side thereof.

It may be seen that the opening of the bit receiving slot 24 of the stud 22 to one side of said stud, prevents material, such as fine coal, from clogging in said slot and also enables more stock to be provided in said stud than if an aperture were broached through the center thereof, as in my prior patent.

The stud 22 slidably fits in an aperture 25 extending lengthwise through the block in a plane herein shown as being substantially parallel to the plane of travel of the block. This aperture may be a drilled hole in which said stud is slidably fitted, and, in the form shown in the drawing, the forward end of said stud is adapted to extend through the block to the forward face thereof to permit ready removal thereof.

A pin 26 is provided to prevent turning movement of the stud 22 to hold the bit receiving slot 24 substantially in alignment with the slot 17 to permit ready insertion of the bit 16 in the slots 17 and 24. Said pin, as herein shown, extends through the block and engages a flattened surface formed on the stud 22 to prevent turning of said stud, but to permit slidable movement thereof within the aperture 25, and thus to permit tightening of the nut to draw the bit against the rear face of the slot 17.

In the modified form of clamping member shown in Fig. 7, a bit receiving slot 27 is provided in the stud 22. This slot is shown as being provided with beveled corners 28, 28 adapted to engage the side of the bit and force it against the side of the slot 17 with a wedging action in order to more firmly hold said bit within said slot.

Referring now in particular to Figures 5 and 6 and the flanged bearing members 11 and 12 and the means for connecting adjacent blocks of the chain together, the bearing member 12 is provided with a recessed shouldered portion 30, and the bearing member 11 is provided with a shouldered annular projecting portion 31 which is adapted to snugly fit within said recessed portion to interlock the two bearing members and to prevent axial movement of said bearing members with respect to each other about an axis transverse to their longitudinal center. Said bearing members are each provided with an aperture 32 extended therethrough, which may be drilled and which are herein shown as being serrated. The serrations of said apertures are adapted to engage the outer periphery of the rivet 14 to prevent turning of said bearing members with respect to said rivet.

In the modified form of my invention shown in Figures 8 and 9, flanged bearing members 33 and 34 are provided to connect the links 10, 10 of the chain together. These bearing members are similar to the bearing members 11 and 12 except

that the bearing member 33 is provided with an integrally formed threaded stud 35 which is threaded within the bearing member 34. Each of said bearing members is provided with a slot 36 for a spanner wrench, for tightening the bearing member 34 on the stud 35, and when tightened an end of the stud 35 is peened over into the slot 36 of the bearing member 34 for locking said bearing members from movement with respect to each other.

It may now be seen that a simplified form of self-cleaning cutter chain has been provided consisting of a number of links pivotally connected together in offset relation with respect to each other so as to leave an upper and lower space in the chain guide, between alternate links, which permits the chain to readily clear slack or cuttings from the chain guide, and including a new and improved form of bit holding means for securely holding a relatively short bit of the throw away type in the chain block in the proper cutting position. It may also be seen that this bit holding means is so arranged as to permit cuttings in the bit holding slot to be readily cleared therefrom and to prevent the bits from sticking in the blocks. It may still further be seen that a connecting means of a simplified and improved form has been provided for connecting adjacent links of the chain together, which consists of a pair of interlocked bearing members secured together to prevent spreading or twisting of the links with respect to each other, except about the axes of said bearing members.

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 myself to the specific embodiment illustrated, excepting as it may be limited in the appended claims.

I claim as my invention:

1. In a cutter chain, a plurality of links, and means for pivotally connecting said links together comprising a pair of aligned flanged bearing members, the flanges thereof being adapted to engage recessed shouldered portions formed in the outer sides of the links of said chain, and one of said bearing members having a recessed socket formed therein, adapted to be engaged by a projecting shouldered portion of said other bearing member, to prevent movement of said bearing members with respect to each other about a transverse axis, each of said bearing members being apertured, a connecting member extending through said apertures of said bearing members for securing said links and bearing members together, and the walls defining the apertures of said bearing members being serrated to prevent turning movement of said bearing members with respect to said connecting member.

2. In a cutter chain, a plurality of links, and means for pivotally connecting said links together comprising a pair of aligned flanged bearing members, the flanges thereof being adapted to engage recessed shouldered portions formed in the outer sides of the links of said chain, one of said bearing members having a recessed socket formed therein, the other of said bearing members having a shouldered portion adapted to engage said socket, said first mentioned bearing having an internally threaded portion and said other bearing member having an integrally

formed threaded projection adapted to be threaded within said internally threaded portion for holding said bearing members and the links of said chain together, and the other end of said internally threaded portion having means formed therein to receive an overturned end of said threaded portion to prevent turning movement of said bearing members with respect to each other.

3. In a chain of the character described, a pair of chain links, and means to pivotally connect said links together including a bearing member split in the plane of travel of the chain to form two aligned and abutting bearing portions having surfaces which abut adjacent the central portion of the chain, one of said bearing portions extending through one link and a part of the next adjacent link and having a shouldered recessed portion therein, said other portion extending through said next adjacent link and having a shouldered projecting portion engaging said shouldered recessed portion, to provide an interlocking connection between the inner ends of said split bearing member, and means to secure said split bearing members together and prevent turning movement of one of said bearing members with respect to the other.

4. In a chain of the character described, a plurality of chain links, and means to pivotally connect said links together including a bearing member split in the plane of travel of the chain to form two aligned and abutting bearing portions having surfaces which abut adjacent the central portion of the chain, one of said bearing portions extending through one link and a part of the next adjacent link and having a shouldered

recessed portion therein, and said other portion extending through said next adjacent link and having a shouldered projecting portion engaging said shouldered recessed portion, to provide an interlocking connection between the inner ends of said split bearing member, and means to secure said split bearing members together, arranged to prevent turning movement of one of said bearing members with respect to the other including a rivet extending through said bearing and engaged by internally formed serrated surfaces in the aperture in said bearing portions, through which said rivet extends.

5. In a chain of the character described, a plurality of chain links, and means to pivotally connect said links together including a bearing member split in the plane of travel of the chain to form two aligned and abutting bearing portions having surfaces which abut adjacent the central portion of the chain, one of said bearing portions extending through one link and a part of the next adjacent link and having a shouldered recessed portion therein, and said other portion having a shouldered projecting portion engaging said shouldered recessed portion, to provide an interlocking connection between the inner ends of said split bearing member, and a projecting threaded portion extending from said shouldered projecting portion and threaded in and extending through said other portion, and said other portion having a slot formed in the outer end thereof to permit overturning of the end of said threaded portion, for holding said portions of said bearing member from rotation with respect to each other.

THOMAS E. PRAY.