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N. K. BOWMAN

1,903,772

CORE BREAKER

Filed June 10, 1932

Fig. 1.

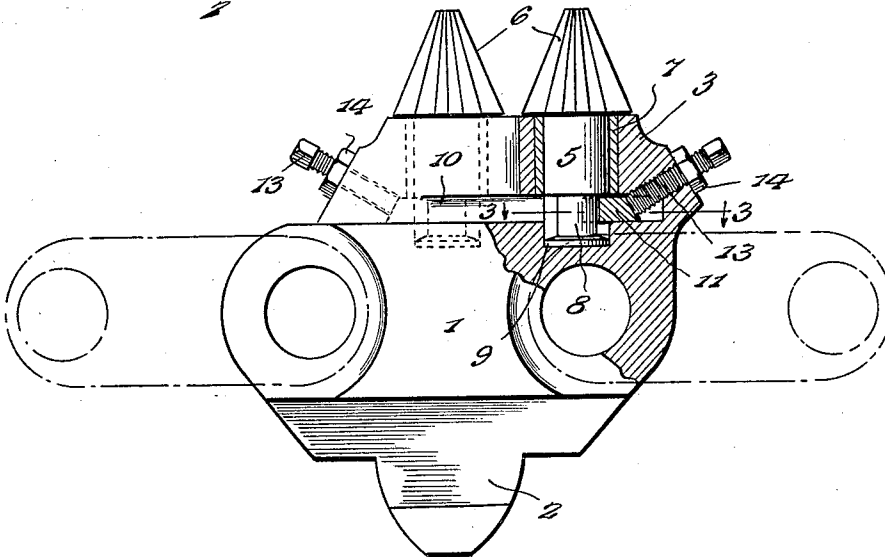


Fig. 2.

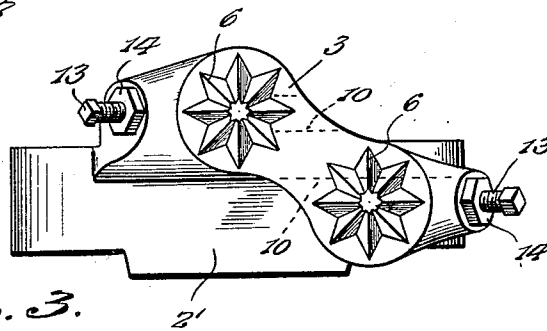


Fig. 3.

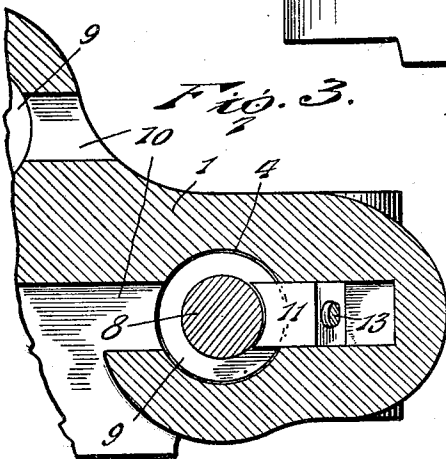
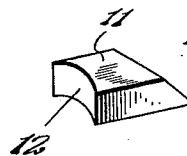


Fig. 4.



Inventor

N. K. Bowman.

By

Lacey Lacey,

Attorneys

UNITED STATES PATENT OFFICE

NEWTON K. BOWMAN, OF BOWDIL, OHIO

CORE-BREAKER

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This invention relates to the core-breakers employed in the cutter chains of mining machines and has for its object to simplify the construction and more firmly hold the core-breaker against withdrawal and damage and provide for the discharge of possible accumulations of dust. The invention is illustrated in the accompanying drawing and will be hereinafter fully set forth and defined.

In the drawing, Figure 1 is a view, partly in side elevation and partly in section, of a core-breaker embodying the present invention.

Fig. 2 is a top plan view of the same.

Fig. 3 is an enlarged detail section on the line 3—3 of Fig. 1.

Fig. 4 is a detail perspective view of the keeper plate.

Mining machines at the present time embody an endless chain carrying cutters which are operated to move along a bank of coal and form clefts therein which facilitate the subsequent breaking down of the shelf of coal. In many mines, foreign matters are found in the layers of coal which resist the action of the cutters so that the cutters move around these foreign elements and leave the same projecting from the face or bank of the coal. I have heretofore provided core-breakers which ride upon and break down these projecting cores of hard foreign matters so that the cutters following the core-breakers may proceed in their prescribed straight paths without putting breaking strains on the cutter chain and causing excessive wear on the chain guides and bits. In the accompanying drawing, the numeral 1 designates a block or link to which coupling links are pivoted whereby the block may be properly connected in a cutter chain. Upon one side, the block 1 is formed with a tooth 2 to be engaged in sockets in a driving wheel whereby the chain may be driven and also to engage in guide grooves in the cutter bar so that the block will be supported and guided at the face of the coal. On its outer flat face 2', the block is formed with a diagonally disposed reinforcing boss 3 having openings 4 formed therein to receive the shanks 5 of core-breakers 6, it being noted, upon reference to Figs. 1 and 2, that the core-breakers are conical or tapered heads having corrugated or ribbed sides so that upon engaging a projecting core they will roll over the same and by their engagement therewith will produce a hammering or chipping action thereon which has been found to very effectually break down the cores. The shanks 5 are of circular cross section so that they may readily rotate within the openings in the block and bushings 7 of hard metal are preferably disposed within the openings so as to minimize wear. The inner end portions of the shanks are reduced in diameter to provide stems 8 and annular flanges 9 are formed at the inner extremities of the stems so that a space or annular groove is formed between the end of the shank and said flange. A passageway 10 is formed in the offset reinforcement 3 of the bit block and in one end of the passageway is fitted a keeper plate 11 having a concave end 12 adapted to fit around the stem 8, as will be understood. A set bolt 13 is mounted in the inclined end of the bit block with its inner end bearing upon the outer end of the keeper plate 11, as clearly shown in Fig. 1, so that said plate may be effectually held to the stem between the shank and the flange 9 and thereby prevent accidental withdrawal of the core-breaker while permitting free rotation of the same and sufficient endwise movement thereof to accommodate the thrust exerted by contact with the projecting core. The set bolt is held firmly in its set position by a lock nut 14 mounted thereon and bearing against the inclined end of the reinforcing boss. Upon reference to Fig. 2, it will be noted that one core-breaker is disposed on the medial longitudinal line of the block 1 while another core-breaker is disposed at one side of said line or in offset or staggered relation to the first-mentioned breaker. The core-breakers will, consequently, travel in different paths so that they will act over a relatively wide extent and, consequently, will very effectually impinge upon any projecting core. By merely reversing the block, the

core-breakers may be relatively reversed so that one set of breakers will act at one side of the path followed by the cutter chain and another set of core-breakers will act at the opposite side of said path. The passageways 10 will, of course, be provided at both sides of the block 1 and they not only provide means facilitating the placement of the keeper blocks 11 but also provide clean-out holes for the discharge of any coal dust or other accumulation which may find its way past the core-breakers and tend to accumulate about the shanks or stems thereof.

Having thus described the invention, I claim:—

1. A link block for mining machine cutter chains having an offset reinforcement on its outer face, said reinforcement having openings therethrough, core-breakers loosely fitted in said openings and having reduced stems at their inner ends, said stem being provided with annular flanges at their inner extremities, keeper blocks disposed within the offset reinforcement to engage around said stems between the ends thereof, and means for maintaining said keeper blocks in engagement with the core-breakers.

2. A link block for the cutter chains of mining machines having an offset reinforcement on its outer face, said reinforcement having openings therethrough and being provided with passageways communicating with said openings and opening through the side of the reinforcement, core-breakers having shanks loosely fitted in said openings and formed with reduced stems extending from the inner ends of the shanks and provided at their inner extremities with annular flanges, keeper plates fitted in the passageways at the closed ends thereof to engage around the stems of the core-breakers between the shanks thereof and the annular flanges, and set bolts mounted in the end portions of the reinforcement and bearing upon said keeper plates whereby to maintain them in engagement with the stems of the core-breakers to prevent accidental withdrawal of the breakers.

3. A core-breaker including a link body having a reinforcing boss extending from one face thereof and provided with spaced sockets disposed one in advance of and offset with respect to the other, there being clean-out openings communicating with the sockets near the lower ends thereof, and core-chipping burrs mounted for rotation in said sockets.

4. A core-breaker including a link body having a flat outer face provided with a reinforcing boss extending diagonally of said face and provided with spaced sockets disposed one in advance of and offset with respect to the other, there being clean-out openings communicating with the lower ends of

the sockets, one of the clean-out openings being disposed in the plane of said flat face, and core-chipping burrs mounted for rotation in said sockets.

5. A core-breaker for mining machines including a link body having one end thereof provided with a guide tooth for engagement with a guide channel in a cutter bar of the mining machine and its other end provided with a reinforcing boss having spaced sockets formed therein and disposed one in advance of and offset with respect to the other, there being clean-out openings formed in the boss and communicating with the lower ends of the sockets, and core-chipping burrs mounted for rotation in said sockets.

6. A core-breaker for mining machines including a link body having one end thereof provided with a guide tooth adapted to enter a guide channel in the cutter bar of the mining machine and its other end provided with a reinforcing boss having its opposite ends provided with downwardly inclined terminal faces, there being spaced sockets formed in the boss disposed one in advance of and offset with respect to the other, core-chipping burrs mounted for rotation in the sockets and provided with grooves, keepers fitting in said grooves, clamping screws threaded in the terminal inclined faces and engaging the keepers, and locking nuts threaded on the screws and bearing against said inclined faces.

In testimony whereof I affix my signature.

NEWTON K. BOWMAN. [L. S.]