Sept. 24, 1935. J. W. ARMOUR 2,015,581

PULVERIZER HAMMER

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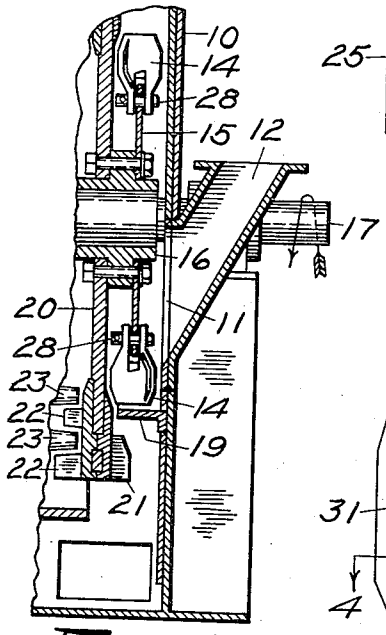


Fig. 7

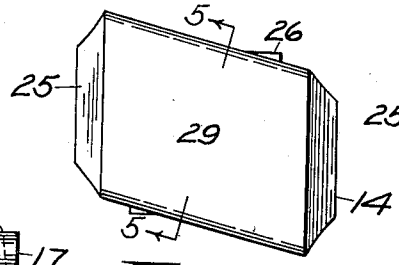


Fig. 3

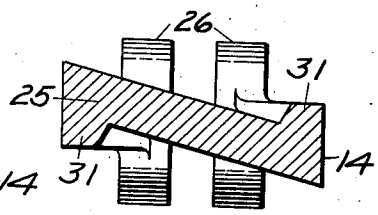


Fig. 4

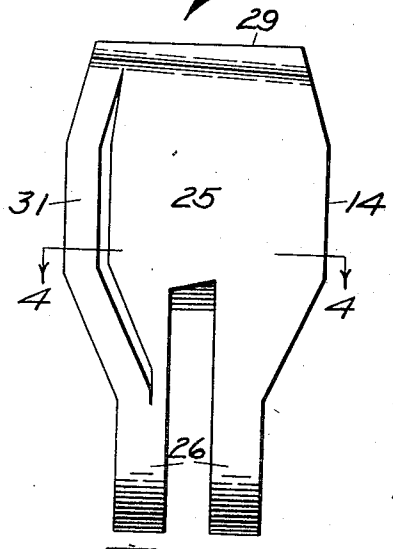


Fig. 1

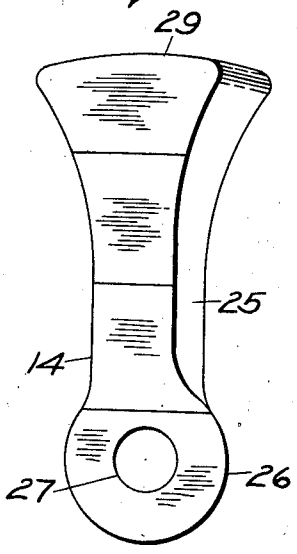


Fig. 2

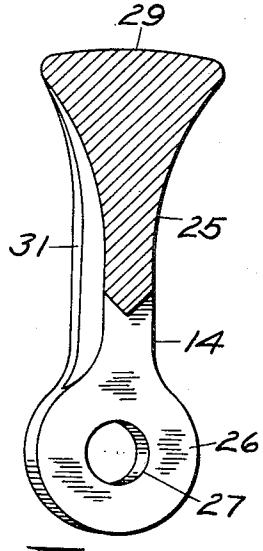


Fig. 5

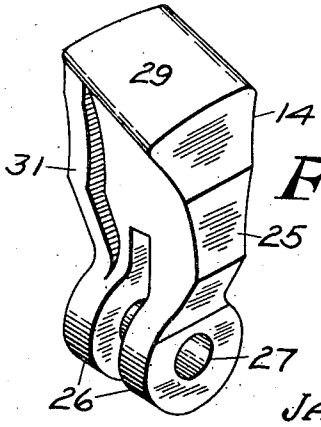


Fig. 6

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PULVERIZER HAMMER

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2 Claims. (Cl. 83—11)

This invention relates to pulverizer hammers, and more particularly to an improved preliminary breaker hammer adapted for use in pulverizers of the general type disclosed in the patent to Andrews No. 1,840,380.

The said Andrews patent discloses a pulverizing apparatus comprising a series of hammers revoluble about a horizontal axis. The coarse material to be pulverized is introduced laterally into the path of the hammers through a feed opening in the casing, and a semi-circular plate is located beneath the hammers to catch this material and prevent it from falling directly to the bottom of the casing without being broken up by the hammers. A revoluble disk is mounted at the opposite side of the hammers from the feed opening, and this disk carries pegs which cooperate with stationary pegs on the casing wall and serve to pulverize the material finely after it has been preliminarily crushed by the hammers.

It is found that the hammers as heretofore constructed wear rapidly at the outer corner on the side adjacent to the feed opening, and as a result replacement is necessary after a comparatively short period of operation, although the greater part of the original hammer structure remains unaffected. Furthermore, the plate beneath the hammers is likewise subjected to concentrated wear directly opposite the said outer corners of the hammers, and hence must be replaced more frequently than is desirable. These replacements are expensive, not only because of the costly material used for the parts, such as manganese steel for example, but also because of the enforced interruption in the operation of the pulverizer.

It is accordingly one object of the invention to overcome these difficulties and to provide a pulverizer hammer which will have a much longer life of usefulness than constructions heretofore used.

It is a further object of the invention to provide a pulverizer hammer so constructed that wear due to abrasion in service will occur substantially evenly over its operative surface.

It is a further object of the invention to provide a preliminary breaker hammer particularly suitable for use in a pulverizer of the general type disclosed in the patent to Andrews No. 1,840,380, and to so construct the hammers as to avoid concentrated wear on the plate therebeneath.

It is a further object of the invention to provide a pulverizer hammer which will have ample strength to withstand contact with tramp iron or other foreign bodies, and which will provide an extensive surface subject to wear, without necessitating an excessive weight of expensive material for its manufacture.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claims appended hereto.

Referring to the drawing illustrating one embodiment of the invention, and in which like reference numerals indicate like parts,

Fig. 1 is an elevation of my improved pulverizer hammer;

Fig. 2 is a side view of the hammer shown in Fig. 1;

Fig. 3 is a top plan view of the hammer shown in Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 1;

Fig. 5 is a section on the line 5—5 of Fig. 3;

Fig. 6 is a perspective view of the hammer; and

Fig. 7 is a section showing a portion of a pulverizer with my improved hammers mounted therein.

Referring first to Fig. 7 of the drawing, I have there illustrated a portion of a pulverizer comprising a casing 10 having a feed opening 11 in one side wall thereof for the introduction of coarse material. An inclined feed chute 12 leads to the opening 11. A series of hammers 14 are mounted within the casing and arranged to be revolved about a horizontal axis. For this purpose the hammers 14 are shown fastened to the periphery of a vertical disk 15 which is bolted to a hub 16, and the hub is mounted on a horizontal revoluble shaft 17. The hammers 14 revolve close to the inlet opening 11, so that the coarse material is delivered laterally into the path of the hammers. A plate or shelf 19 is mounted on the casing wall below the inlet 11 and projects beneath the hammers. It will be understood that this plate 19 is curved in a circular arc concentric with the shaft 17 and extends throughout approximately the entire 180 degrees below the horizontal axial plane. A large vertical disk 20 is mounted on the hub 16 on the opposite side of the hammers from the inlet. This disk 20 carries a series of agitator pegs 21 on the side toward the hammers, and on the other side two rows of pulverizing pegs 22 are mounted. The pegs 22 interfit with stationary pegs 23. For a further disclosure of the structure and operation of the pulverizer, reference may be had to the patent to Andrews No. 1,840,380.

The present invention is concerned primarily with the construction of the preliminary breaker hammers 14. Each of these hammers comprises

a body portion 25 having a pair of spaced ears or lugs 26 projecting from the inner edge thereof. These ears 26 are provided with aligned circular openings 27. At assembly, the ears 26 straddle the disk 15, and a pin 28 is passed through the openings 27 and a similar opening in the disk, thus providing a pivotal support for the hammers. The pins 28 are parallel to the axis of the shaft 17. In operation the hammers will be held in radial positions by the centrifugal force resulting from the high speed at which they are revolved.

In order to distribute the in-coming material over the hammer and avoid concentrated wear on any particular portion thereof, the striking surface of the hammer is sloped backwardly at a slight angle from the outer corner at the inlet side, in both the lateral and radial directions. The hammer thus acts somewhat in the manner of a plow, and throws the material over substantially the entire front or striking face. In the preferred construction, the body portion 25 is arranged at an angle to the axis of the openings 27, as shown in Fig. 4, and flares outwardly in a radial direction away from the lugs 26, as shown particularly in Fig. 5. The outer surface 29 of the hammer is preferably concentric with the axis of the openings 27.

As a result of the lateral inclination of the hammer body 25, there is a tendency for material to be thrown against the disk 20, thus causing considerable wear and abrasion on the disk. I avoid this by providing a rib 31 which extends along the lateral margin of the front face of the hammer at the side opposite to the inlet opening 11. Most of the material sliding over the surface of the hammer is stopped by this rib and thus kept from contacting with the disk 20. Ribs 31 are preferably provided on both faces of the body 25 in diagonally opposite positions, as shown particularly in Fig. 4, so that the hammer is Z-shaped in cross-section. With this construction the hammer is reversible, and after one surface is badly worn the hammer may be turned around and operated with the opposite surface in front. The ribs 31 greatly strengthen the hammer without adding appreciably to its weight, and reduce the danger of breakage in the event a hard foreign body, such as a piece of tramp iron, should enter the machine.

The operation of the invention will now be apparent from the above disclosure. The shaft 17 is rotated in the direction of the arrow by a suitable source of power, and coarse material is supplied to the chute 12 by means of a suitable feeding device. The material passes through the opening 11 and is broken up by the action of the revolving hammers 14. The air currents through the machine carry the material around the periphery of the disk 20 and into contact with the interfitting pegs 22 and 23, which serve to reduce the material to a fine powder. By reason of the lateral and radial inclination of the front faces of the hammers 14, the material is thrown over a considerable area of the hammers, and concentrated wear is avoided. Furthermore, the hammers spread the material laterally over the surface of the plate 19, so that the useful life of this plate is greatly increased. The ribs 31 strengthen the hammers and prevent the material from being thrown against the disk 20. The hammers can be reversed after one face has become worn, and they may then be kept in service until a large part of the original hammer structure has been worn away.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A pulverizer hammer comprising a body portion and a supporting lug projecting inwardly therefrom, the body portion being Z-shaped in cross-section and flaring outwardly in a radial direction.

2. A pulverizer hammer comprising a supporting lug having an opening, a body portion integral with the lug and inclined at an angle to the axis of the opening, the body portion flaring outwardly in a direction away from the lug, and two ribs located in diagonally opposite positions on the body portion, each rib extending along a lateral margin of the body portion to form a structure Z-shaped in cross-section.

JAMES W. ARMOUR.