No. 738,507. PATENTED SEPT. 8, 1903.

M. F. WILLIAMS.

BREAKER BAR.

APPLICATION FILED OCT. 4, 1902.

NO MODEL.

Fig. 1.

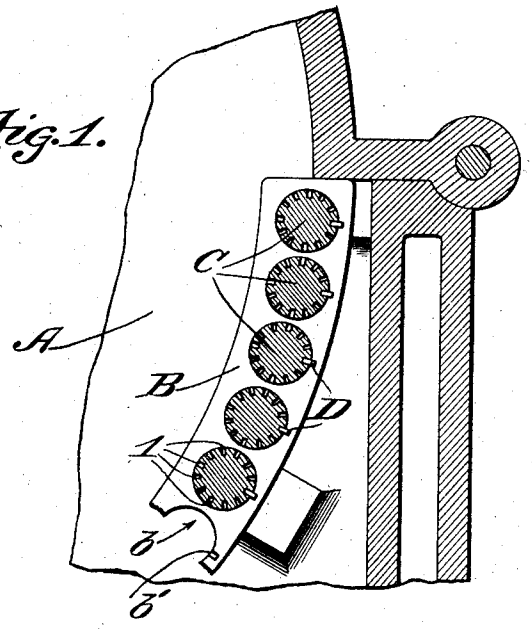


Fig. 2.

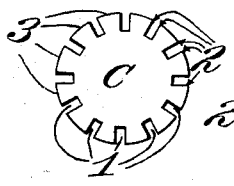
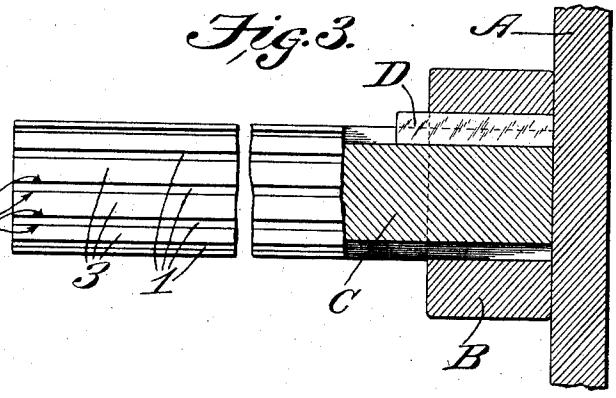


Fig. 3.



Witnesses:

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Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 738,507. Patented September 8, 1903.

UNITED STATES PATENT OFFICE.

MILTON FRANKLIN WILLIAMS, OF ST. LOUIS, MISSOURI, ASSIGNOR TO WILLIAMS PATENT CRUSHER & PULVERIZER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

BREAKER-BAR.

SPECIFICATION forming part of Letters Patent No. 738,507, dated September 8, 1903.

Application filed October 4, 1902. Serial No. 125,882. (No model.)

To all whom it may concern:

Be it known that I, MILTON FRANKLIN WILLIAMS, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Breaker-Bars, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a fragmentary sectional elevation of a portion of a machine with my present invention applied. Fig. 2 is an end elevation of the bar; and Fig. 3 is a side elevation of said bar, one end of the same being shown in position in the side plate of the cage, and said bar end, side plate, and a wall of the machine being shown in section.

My invention relates to improvements in breaker-bars designed particularly for use in pulverizing-machines and the like, which employ rapidly-revolving beaters. Such machines are well known in the art, and in their action the material being operated upon is thrown by the beaters against the said bars for the purpose of breaking said material. Heretofore in such machines cylindrical breaker-bars having unbroken surfaces have been employed. In grinding-machines, in which the material is reduced by attrition only and is not forcibly thrown against a surface to be broken or chipped by means of the force of the blow, corrugated grinding-bars have been employed, and such machines have also included grinding-plates provided with projecting angular ribs which extend across the machine, said ribs being spaced a relatively large distance from each other and the grinding-plates being reversible end for end and side for side. These fluted grinding-bars and the grinding-plates just described cannot be successfully employed as breaker-bars of pulverizing-machines of the class described. The flutes present blunt, rounded, or tapering projections whose ends would be easily broken by material thrown against them, and as soon as the ends of said projections were broken the bars would become useless as breaker-bars. The grinding-plates above described present substantially independent and isolated ribs, and these would be quickly broken by the material thrown with great force against them. Furthermore, both the flutes and the isolated or widely-separated ribs present relatively large flat surfaces, against which the material would merely be thrown and shattered.

My object is to provide a breaker-bar which can be easily applied to its support and readily adjusted, said bar having protected stock portions provided with sharp cutting edges and being able to withstand a great deal of wear, while its use results in an extremely fine product.

To these ends and also to improve generally upon devices of the character indicated my invention consists in the various matters hereinafter described and claimed.

Referring now more particularly to the drawings, A represents a side wall of a pulverizing-machine; B, a side supporting-plate of the cage, which includes the hereinafter-mentioned bars, and C the breaker-bars or "grinding-bars," as they have sometimes heretofore been called. It is to be borne in mind, however, that in these centrifugal pulverizers employing rapidly-revolving beaters, while some grinding action may result between the bars C and the beaters, the most important function of the bars is that of breaking or shattering the material forcibly thrown against them by the beaters. Each bar C is cylindrical and is provided with a series of narrow, radial, longitudinal kerfs or channels 1, which open upon its periphery, the outer edges of the side walls of said channels forming cutting edges 2 at the periphery of the bar. A relatively wide stock 3 is left between neighboring channels. Thus instead of having a bar provided with a series of weak and easily-broken projections there is presented a bar provided with wide and strongly-supported stock portions having intermediate narrow kerfs. The stock portion in advance of its neighboring stock portion serves as a protector for such rear or succeeding stock portion, for as the beaters throw a piece of material tangentially against the bar said material can only slightly enter the

kerf between said stock portions, and thus engages only the outer cutting portion of the said rear stock portion. The said material therefore does not forcibly meet a large side surface of the stock portion, and thus tend to break the latter. Furthermore, the material is not shattered against the side of a rib or projection, but is chipped by the sharp cutting edge 2, the radial kerfs causing the stock portions to be, in effect, undercut, whereby tapering cutting edges are produced. Some of the chips fall into the kerfs; but they are quickly drawn out by the suction created by the beaters and are either delivered from the operating-chamber or returned again and again to the cutting edges of the breaker-bars for further reduction. The side plates of the cage are provided with circular openings or seats *b*, which receive the ends of the bars, said bar ends abutting against the side plates A of the machine-casing. A keyway *b'* opens into each opening *b*, and the kerfs 1 in the bars form cooperating keyways for the reception of the keys D. The bars can be quickly assembled upon the supporting-plates and when so assembled are firmly held in position. Furthermore, each bar can be readily adjusted, it only being necessary to withdraw the key, turn the bar to its new position with a new kerf registering with the keyway *b'*, and then reinsert the key. Each bar is adjustable circumferentially, so that a great number of cutting edges can be formed upon a single bar, and when the several cutting edges of what may be termed the "rear walls" of the kerfs have become worn the bar can be turned end for end, whereupon the cutting edges of what have been the front slot-walls become available. Thus the present bar affords a great number of sharp cutting edges. Each stock portion provided with a cutting edge is protected by the stock portion in advance of the same. The stock portions are strong and are firmly supported. The bar can be easily and quickly placed in position. A great number of adjustments are afforded, and adjustment can be quickly effected.

I am aware that many minor changes in the construction, arrangement, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. The combination with a support provided with a bar-seat and a keyway opening thereinto, of a breaker-bar seated in said seat and provided about its periphery with a series of kerfs adapted to coöperate with said keyway, and a key entering said keyway and one of said kerfs; substantially as described.

2. The combination with breaker-supports having keyways, of a breaker-bar provided with a series of longitudinal kerfs extending its entire length, and keys in said keyways and in the kerfs at each end of the breaker-bar; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 1st day of October, 1902.

MILTON FRANKLIN WILLIAMS.

Witnesses:
GALES P. MOORE,
GEORGE BAKEWELL.