June 2, 1931. H. J. SHELTON 1,808,264

CRUSHER AND PULVERIZER

Filed March 26, 1927 2 Sheets-Sheet 1

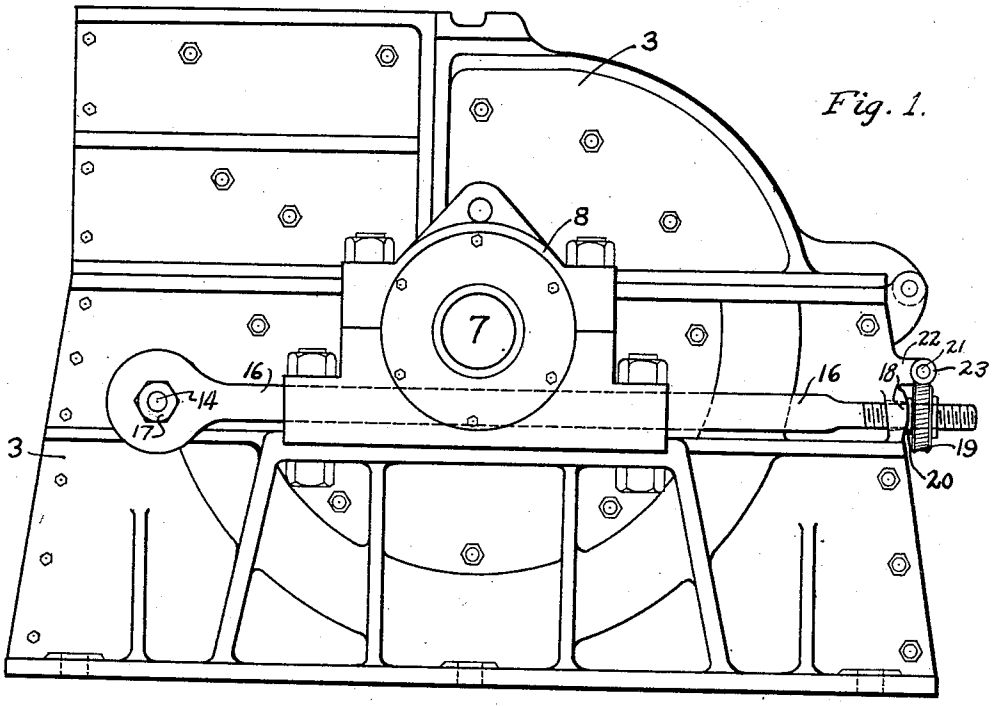


Fig. 1.

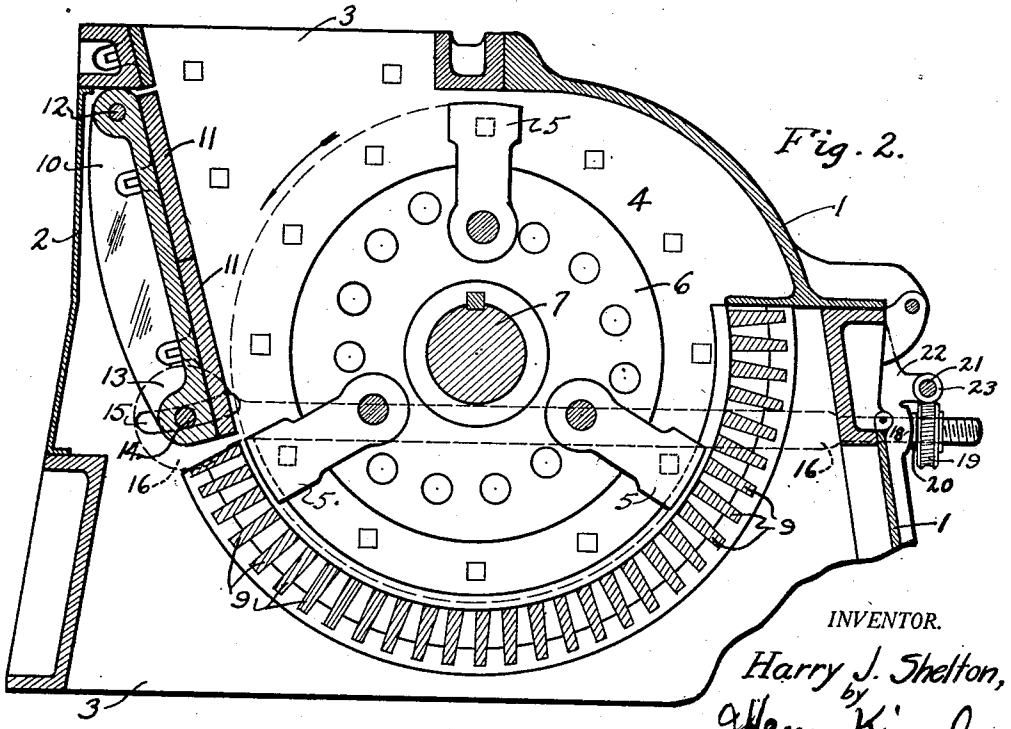


Fig. 2.

INVENTOR.
Harry J. Shelton,
by
Henry Kinsley.
ATTORNEY.

June 2, 1931. H. J. SHELTON 1,808,264

CRUSHER AND PULVERIZER

Filed March 26, 1927 2 Sheets-Sheet 2

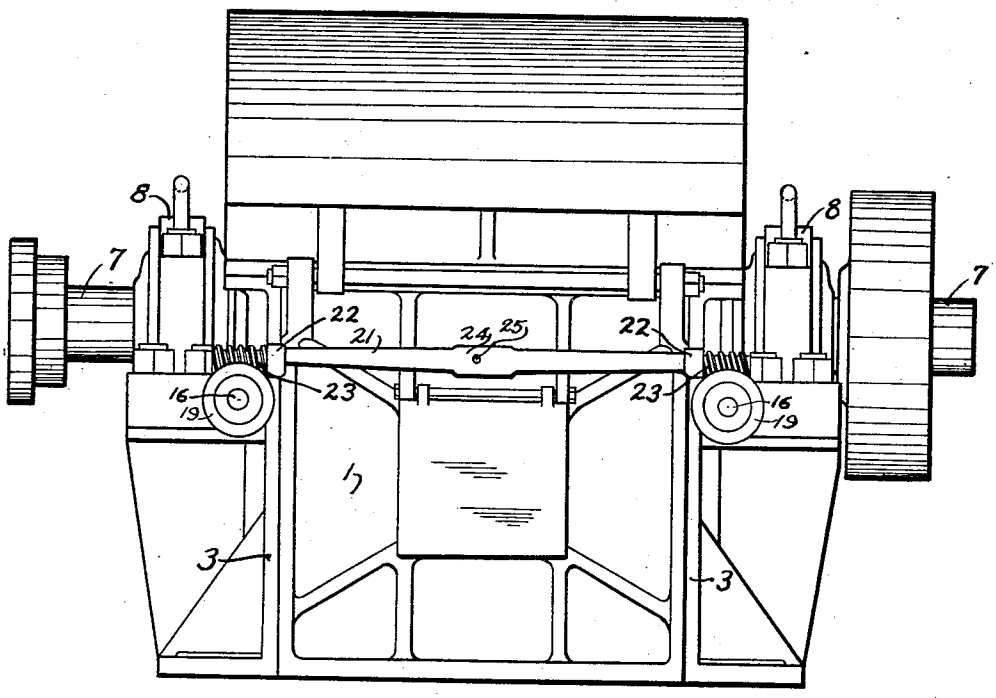


Fig. 3.

INVENTOR
Harry J. Shelton,
BY Henry Kinnaly
ATTORNEY

Patented June 2, 1931 1,808,264

UNITED STATES PATENT OFFICE

HARRY J. SHELTON, OF ST. LOUIS, MISSOURI

CRUSHER AND PULVERIZER

Application filed March 26, 1927. Serial No. 178,660.

My invention relates to crushers and pulverizers and more particularly to crushers and pulverizers comprising a housing having a pulverizing chamber with a crushing element mounted therein and also having an adjustable breaker plate mounted to form part of the wall of the pulverizing chamber and to cooperate with the crushing element to reduce material fed into the machine.

Heretofore in crushers and pulverizers of this type there has been great difficulty in mounting the adjustable breaker plate, sometimes called the crushing head, so that it may be quickly and easily adjusted and yet be rigidly maintained in a predetermined adjusted position.

In this type of machine it is desirable that the breaker plate be capable of adjustment from outside of the machine and, therefore, the rods extending from each end of the breaker plate at the lower side thereof necessarily had to extend to a point outside of the housing where they were engaged by side bars which controlled the movement in adjustment of the breaker plate. Since the breaker plate was usually pivoted at its upper side, when the lower end thereof was swung about the pivot as an axis the rods projecting from the ends of the breaker plate necessarily moved in two directions, that is backwardly or forwardly and up or down. To allow this double movement ribs were extended rearwardly from the back of the breaker plate and these ribs were provided with substantially vertical slots which cooperated with substantialy horizontal slots in the housing to allow the double movement of the rods. However, such slots formed a rather loose contact with the rod and allowed more or less vibration of the breaker plate.

Further, in machines of this type as heretofore manufactured each end of the breaker plate was adjusted independently of the other end and, therefore, the breaker plate at one end might be comparatively close to the crushing element while the other end of the plate was removed from the crushing element a substantial distance.

The objects of my invention are to provide a simple and effective means to allow adjustment of the breaker plate with respect to the crushing element and yet rigidly hold the plate in a desired adjusted position and to provide in a machine of this type a single actuating means for simultaneously adjusting both ends of the breaker plate in relation to the crushing element.

My invention is fully shown in the accompanying drawings wherein similar characters are used to designate similar parts; Fig. 1 is a side view of a crusher and pulverizer embodying my invention; Fig. 2 is a sectional view of the machine along the lines 2—2 in Fig. 3; Fig. 3 is a front view of the machine.

Referring now to the figures the crusher and pulverized shown therein as embodying my invention in the attainment of the objects set forth above has a housing which has a front wall 1, a back wall 2 and side members 3. The housing has a pulverizing chamber 4 therein in which, in this form of my invention, is mounted a crushing element consisting of hammers 5 loosely mounted between disks 6 fixed onto the shaft 7 which is rotatably mounted in the bearings 8 at each side of the housing. The lower circumferential wall of the pulverizing chamber is formed by a series of grate bars 9.

At the back of the pulverizing chamber is an adjustable breaker plate 10 which has on its face detachable blocks 11 which may be replaced when they become worn by the impact of material being reduced. The breaker plate is pivotally mounted at its upper end on the shaft 12 which extends between the side members 3. At the lower end of the breaker plate are formed lugs 13 in which is fixed a rod 14 which is long enough to project outwardly from the ends of the breaker

plate and through slots 15 in the side members 3. The outer end of the rod 14 at each side of the housing is engaged by the inner end of a bar 16 and, preferably, the outer ends of the rod 14 are threaded to receive a nut 17 which is used to hold the inner end of the bar 16 in place. The inner end of the bar 16, as shown in Fig. 1, is preferably provided with an enlargement so that it will substantially cover the slots 15 to keep dust from passing from the space under the pulverizing chamber. The outer end of each of the bars 16, that is, the end opposite the end which is in engagement with the rod 14, passes through a lug 18 formed on the housing.

The end of the bar 16 outside the lug 18 may have a nut threaded thereon to control the longitudinal movement of the bar, as hereinafter explained, but I prefer that it have a worm wheel 19 threaded thereon, for the purposes more fully outlined below. Also, I prefer that the outer face of the lug 18 be convex and that a washer 20 having a concave face be positioned between the lug and the worm wheel 19 so that the inner end of the bar 16 will be allowed a slight rocking movement. A shaft 21 is arranged transversely of the bars 16 and is journaled in the projections 22. The shaft 21 has fixed thereon worms 23 positioned to engage with the worm wheels 19 on the bars 16 whereby a rotation of the shaft 21 will turn the worm wheels 19 and thereby cause a longitudinal movement of the bars 16. I prefer that a portion 24 of the shaft 21, positioned substantially centrally longitudinally thereof, be shaped to receive a wrench to facilitate rotation of the shaft to move the bars 16. Also, this portion may have a hole 25 therein to receive a spike or crowbar which may be used to rotate the shaft.

When it is desired to adjust the breaker plate 10 in relation to the crushing element, which in this embodiment of my invention consists of the hammers 5, the shaft 21 is rotated and, as outlined above, this rotation through the worms 23 and worm wheels 19 causes the bars 16 to be moved either backwardly or forwardly as desired and as governed by the rotation of the shaft 21. It will be readily seen that when it is desired to bring the breaker plate closer to the crushing element the bars 16 are moved forwardly and when it is desired to move the breaker plate away from the crushing element the bars 16 are moved backwardly. The slots 15 in the side members 3 are, preferably, arcuate in shape, as described above, with the axis of the arc at the axis of the pivotal movement of the breaker plate 10 and, therefore, as the breaker plate is moved backward or forward in its adjustment the rod 14 will move in the direction in which the slots extend. When the parts are arranged as shown in the figures and the bars 16 are moved forwardly to bring the breaker plate 10 close to the crushing element the inner end of the bars will be moved slightly upwardly and, in turn, when the bars are moved rearwardly to move the breaker plate 10 away from the crushing element the inner ends of the bars will be moved slightly downwardly. As heretofore described this movement will be allowed by the convex surface of the lug 18 cooperating with the concave contacting surface of the washer 20. Of course, the shape of these members may be reversed, that is to say, the washer may have a convex surface and the lug have a concave surface.

It may be readily seen that since the side bars 16 are simultaneously moved by a single actuating means both ends of the breaker plate 10 will be uniformly moved and will be in the same adjustment in relation to the crushing element.

It may be readily understood that I do not intend to limit my invention to the exact details of construction shown in the drawings since the shape and arrangement of the various parts may be changed in adapting my invention for use with crushes and pulverizers of different types without deviating from the spirit of my invention as embodied in the claims below.

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

1. A crusher and pulverizer comprising a housing having a pulverizing chamber with a crushing element mounted therein, a breaker plate pivotally mounted at one side thereof to form part of the wall of said pulverizing chamber, a rod extending outwardly from each end of said breaker plate and fixed thereto, the side members of said housing having arcuate shaped slots therein through which said rod extends at each end of said plate, the axis of said arcuate slots being at the axis of the pivotal movement of said plate whereby said rod may be moved to adjust the position of said plate in relation to said crushing element, and bars engaging said rod outside of said housing for controlling the movement of said plate.

2. A crusher and pulverizer comprising a housing having a pulverizing chamber with a crushing element mounted therein, a breaker plate pivotally mounted at its upper side to form part of the wall of said pulverizing chamber, a rod extending outwardly from each end of said breaker plate at the lower side thereof and fixed thereto, the side members of said housing having arcuate slots therein through which the ends of said rod extend, bars engaging said rod at each end of said plate, the outer end of each of said bars passing through a lug on said housing, a worm wheel threaded on the outer end of each of said bars, a shaft arranged transversely of the outer ends of said bars, said shaft having worms thereon in engagement with

the worm wheel on each of said bars whereby when said shaft is rotated said bars will be moved to bring said plate to desired adjusted position, washers positioned on said bars between said worm wheels and said lugs, and the contacting surfaces of said washers and said lugs being shaped and arranged to allow a rocking of the inner end of said bars.

In witness whereof I have signed my name to the foregoing specification.

HARRY J. SHELTON.