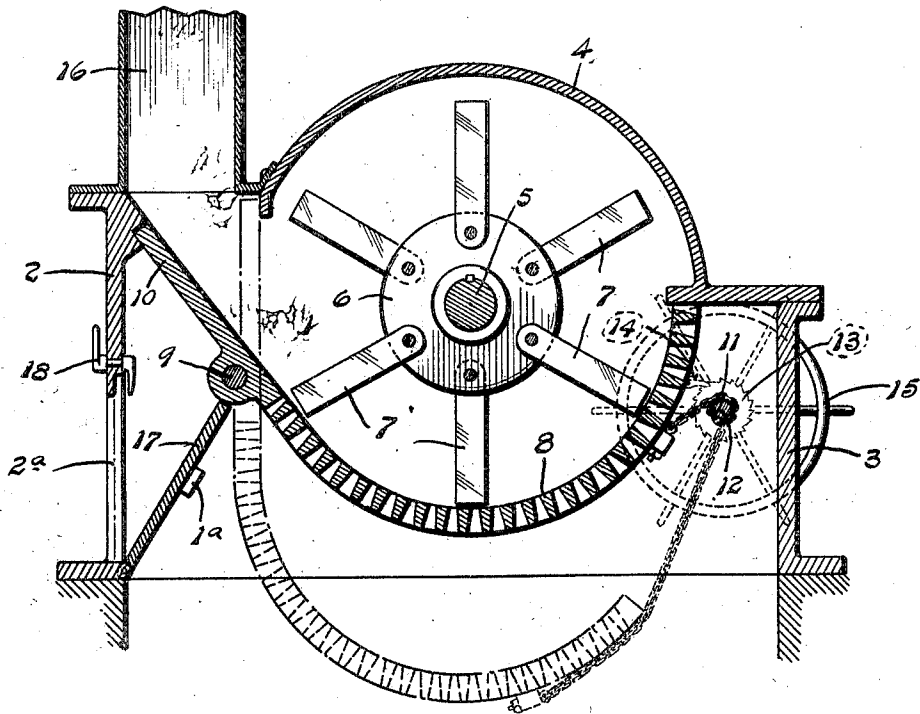


F. R. CORNWALL.
PULVERIZER.
APPLICATION FILED NOV. 15, 1911.

1,039,102.

Patented Sept. 24, 1912.



WITNESSES

Wm. J. Janss.
J. A. Bishop

INVENTOR

Frederick W. Cornwall

UNITED STATES PATENT OFFICE.

FREDERICK R. CORNWALL, OF ST. LOUIS, MISSOURI, ASSIGNOR TO WILLIAMS PATENT CRUSHER AND PULVERIZER COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

PULVERIZER.

1,039,102.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed November 15, 1911. Serial No. 660,523.

To all whom it may concern:

Be it known that I, FREDERICK R. CORNWALL, a citizen of the United States, residing at St. Louis, Missouri, have invented a certain new and useful Improvement in Pulverizers, 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.

This invention relates to a new and useful improvement in pulverizers designed particularly for crushing coal or other material, the object being to provide means whereby the grinding cage may be lowered in the event of a choke in the feed chute to relieve the machine, and incidentally to divert the material outside the casing of the machine and prevent it commingling with the reduced material in the pit or bin under the machine.

In practice, crushers of the hammer type shown in the drawing are frequently employed to reduce "run-o'-mine" coal for coking purposes, the machine being employed at the mine. The coal is brought from the mine in cars and dumped into a bin where it is conducted by a chute directly to the crusher. This chute is usually provided with a gate or valve for the purpose of cutting off the supply of coal from the machine when desired and for obvious reasons. Frequently the coal coming from the mine is wet and is introduced into the machine in large lumps. This wet coal has a tendency to choke up the feed chute and frequently a gorge will be formed in the chute, which, when precipitated into the machine will produce an over-load with possible damage to the machine and injury to workmen around the machine. The operator can by ear tell when the machine is working properly and when the feed is cut off by a choke in the chute and machine runs wild. In anticipation of an over-load, the operator may drop the grinding cage and divert the over-load outside the casing of the machine, or permit

it to fall into the bin under the machine as desired. It sometimes happens also that foreign, uncrushable material, such as pick heads or the like, are accidentally fed into the machine, in which event, it is desired to drop the grinding cage to permit such uncrushable material being thrown out without stopping the operation of the machine. Where the machine is stopped by an overload of material, the grinding chamber is full and the hammers are brought to a standstill with the result that the driving belt will be broken or thrown off, the gear teeth stripped if the machine is gear driven, or fuse blown out, if the machine is motor driven.

In the drawing accompanying my application, the figure represents a longitudinally sectional view through a crusher in which 1 indicates the side frame, preferably in the form of a casing; 2, the front wall; 3, the rear wall; 4, the cage or cover, and 5 is a shaft on which are mounted hammer supporting disks 6 carrying pivotally revolving hammers 7.

8 is the grinding surface in the form of a cage on which the material is reduced and when of such fineness as to pass through the openings in the grinding cage, will be delivered into the bin under the machine. This cage 8 is pivotally mounted upon a rod 9 and is continued upwardly and forwardly to form a breaker plate 10 on which the material is primarily reduced before being acted upon between the cage bars and hammers. This breaker plate 10 has an extended portion and also forms the bottom wall of the feed hopper and of course may be renewable, if desired.

The upper edge of the breaker plate is preferably seated against a rabbet in the upper edge of the front wall, as shown. The free edge of the cage is connected by a chain, or other flexible device which co-operates with a winding shaft 12 on the end of which is a ratchet-wheel 13, coöperating with a pawl 14 to prevent retrograde movement of the winding shaft by which the cage may be adjusted by means of the hand wheel

15, to take up wear on the ends of the hammers and to restore the cage after the same is lowered to relieve the machine of a choke or uncrushable, foreign material before referred to.

The operator can, at any time desired, lift the pawl out of engagement with the ratchet and release the grinding cage to permit the same to swing to a lower position as shown 10 by dotted lines. When in this lowered position, the breaker plate, swinging with the cage, moves against the front edge of the cover, as shown by dotted lines, and preferably under a shoulder in the feed chute so 15 that the material being fed to the machine through the feed chute 16 will not enter the grinding chamber.

17 indicates a deflecting plate, preferably pivoted at its lower edge to the bottom of 20 the front wall 2, and when said plate is in the position shown in full lines, it may rest against lugs 1^a on the side frame castings.

The front wall 2 is provided with an opening 2^a and when the deflecting plate is in the 25 position shown by full lines and the cage is lowered, the breaker plate acts as a valve or gate to prevent the material from entering the grinding chamber and compels said material to take a path alongside of the 30 grinding chamber so that when it strikes the deflecting plate, it will be diverted through the opening 2^a outside of the machine.

If desired, the deflecting plate may be 35 swung to a vertical position to close the opening 2^a and locked in such vertical position by means of a locking device 18 operated by hand on the outside of the machine.

When the deflecting plate is in such vertical 40 position and the cage is lowered, the material will not be deflected outside of the machine, or permitted to drop into the bin or receptacle under the machine.

I do not claim in this application, the 45 pivoted grinding cage or winding mechanism employed for raising and lowering the same, as the same is disclosed in the patent to M. F. Williams, No. 843,729, dated February 12, 1907, except so far as they enter 50 into a novel combination of elements set forth in the following claims.

What I claim is:

1. In a machine of the character described, the combination of hammers, a grinding 55 surface, a breaker plate upon which the material is primarily crushed, said breaker plate having an extension, and means for moving said breaker plate whereby said extension will shut off the supply of material 60 to the grinding surface.

2. In a machine of the character described, the combination of hammers, a pivoted grinding surface, and a pivoted breaker plate, said grinding surface and breaker

plate being connected so as to move together, whereby, when the grinding surface is lowered, the breaker plate will shut off the supply of material to the machine.

3. In a machine of the character described, the combination of hammers, a movable 70 grinding surface, means for permitting said grinding surface to be lowered and for raising said grinding surface again to operative position, and a pivoted breaker plate connected to said grinding surface, whereby 75 when the grinding surface is lowered, the breaker plate will shut off the supply of material from the machine.

4. In a machine of the character described, the combination of hammers, a grinding surface, a feed hopper, one wall of which is 80 movable to shut off the supply of material to the grinding surface, and means for directing the material outside of the machine when said wall is moved to its shut-off position. 85

5. In a machine of the character described, the combination of hammers, a grinding surface, a feed hopper for directing the material to the grinding surface, means for moving 90 one wall of said hopper to shut off the supply of material to the grinding surface, and a deflecting wall for diverting the material so shut off from the grinding surface to a point outside the machine. 95

6. In a machine of the character described, the combination of hammers, a grinding surface, a pivoted breaker plate, and a pivoted deflecting plate for deflecting material flowing in front of said breaker plate when the 100 latter is raised.

7. In a machine of the character described, the combination of a casing, the front wall of which is provided with an opening, hammers, a grinding surface, a pivoted breaker 105 plate, means for moving the breaker plate to shut off the supply of material to the grinding surface, and a deflecting plate for deflecting material through said opening or permitting said material to fall within the 110 machine when the breaker plate is raised.

8. In a mill, the combination of a grinding cylinder having a grinding cage, beaters adapted to cooperate with said cage, a feed 115 hopper communicating with said cylinder, and means for adjusting said cage whereby a portion thereof is moved to prevent ingress of material into said cylinder from said hopper.

9. In a mill, the combination of a casing 120 forming a chamber, a grinding surface and beaters within said chamber, a feed hopper communicating with said chamber and means for moving a portion of said grinding surface to cut off the communication between said chamber and said hopper. 125

10. In a mill, the combination of a casing forming a chamber, beaters mounted in said

chamber, a grinding cage cooperating with
said beaters, a feed hopper, and means for
adjusting a portion of said grinding cage
whereby material contained therein is moved
5 from the reach of said beaters and commu-
nication cut off between said chamber and
said feed hopper.

In testimony whereof I hereunto affix my
signature in the presence of two witnesses,
this 10th day of November, 1911.

FREDERICK R. CORNWALL.

Witnesses:

M. P. SMITH,
LILY ROST.