Nov. 3, 1936. R. D. MacDONALD 2,059,377

GRINDING MILL

Filed April 13, 1934

Fig. 1.

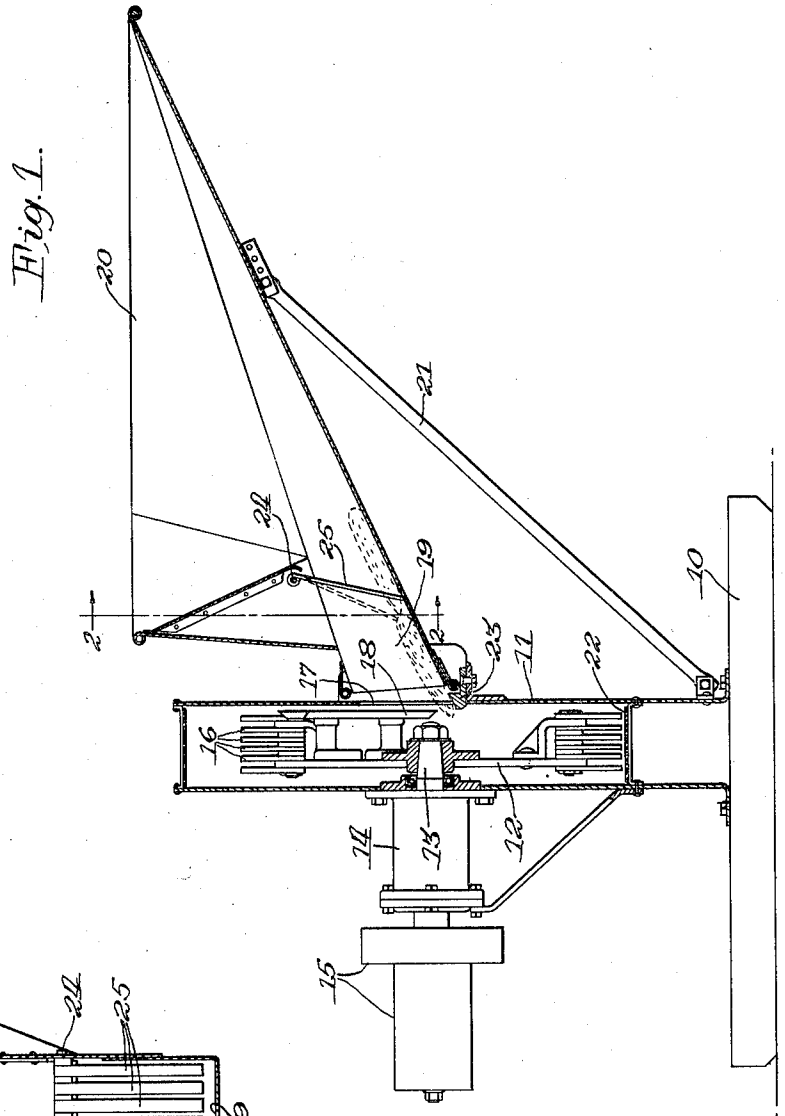
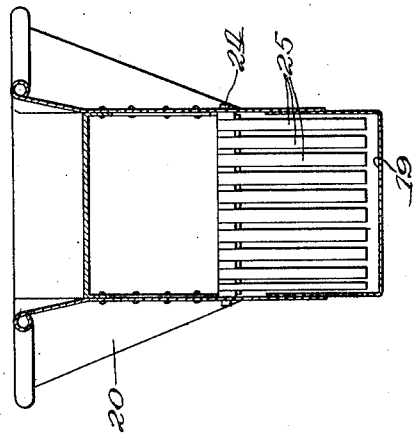


Fig. 2.



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GRINDING MILL

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2 Claims. (Cl. 83—11)

The invention relates to feed grinding mills, and particularly to those of the so-called hammer type having a comminuting rotor in a casing provided with a feed opening and a hopper to lead the material to be reduced thereto. In operating these mills, the high speed of the rotor frequently causes chunks of the material in process, such as cobs or broken parts thereof, to be thrown out of the drum and feed opening with great velocity. When the hopper is not full, such thrown out parts constitute a serious safety hazard endangering life and limb of the mill attendant.

More particularly, therefore, the invention relates to means for overcoming such hazard.

The object of the invention is to provide an improved baffle or gate construction to be located in the feed throat of the mill to prevent parts of the material in process from being thrown out of the machine.

A further object of the invention is to provide such baffle or gate which will not interfere with or constitute any obstruction to the feeding operation.

Another object is to provide such device which will be fool proof and simple and which can be applied to standard mills without altering the construction thereof.

Further important objects will become apparent to those familiar with this art as the disclosure is more fully made.

These objects are achieved by mounting a shaft across the throat of the feed hopper and pivotally hanging therefrom a plurality of spaced baffle arms which substantially obstruct the throat passage and cannot swing outwardly, but only inwardly relative to the feed opening of the mill. Thus, when a cob or part thereof is thrown outwardly, it will hit one or more of these baffle arms and be stopped in its flight, the cob or part then having to feed back into the reducing chamber.

In the drawing showing a practicable form of the invention,—

Figure 1 is a central, vertical cross-sectional view through a hammer mill, showing the baffle or gate of this invention associated therewith; and,

Figure 2 is a cross-sectional view through the hopper of the mill as seen along the line 2—2 of Figure 1 to show a face view of the baffle.

The mill shown is of a well known type having a base 10, upon which is mounted a vertically disposed cylindrical drum 11 to form a reducing chamber in which is the comminuting rotor 12 carried on a shaft 13 mounted in a wall of the drum by means of bracket 14, said shaft being driven from a belt pulley 15. The rotor 12 carries peripherally disposed swinging hammers 16 and on its face adjacent the feed opening 17, a preliminary cutting and breaking knife element 18. The feed opening has the throat 19 of a hopper 20 associated therewith, said hopper being carried on the adjacent wall of the drum 11, as shown. The hopper is supported by a brace 21. The inner periphery of the drum carries a screen 22 which cooperates with the hammers 16 to help reduce the material in process. The wall 11 adjacent the knife 18 carries a stationary shear bar 23 which cooperates with the knife 18 to cut up ears of corn, as shown in Figure 1.

In practice it frequently happens when the hopper is about empty that the rotor hammers 16 operating at high speed bat a cob, or broken part thereof, out of the feed opening 17 and the hopper 20. Obviously this involves a serious hazard to the safety of the attendant. The cooperating action of the knife 18 and shear bar 23 acts frequently also to push the infeeding ears of corn back toward the hopper. To prevent this danger, a baffle or gate is provided which will now be described. Such gate also serves to hold the ears against being pushed back into the hopper under the force of the knife.

Adjacent the top of the throat 19, the hopper 20 carries a cross shaft 24 from which is pendently and pivotally hung a series of spaced baffle arms 25, which substantially obstruct the entrance to the throat 19. These arms 25 can swing inwardly under the press of feed toward the rotor, but they cannot swing backwardly toward the hopper from the full line position shown in Figure 1, because the lower ends of the arms contact the upward slope of the bottom of the hopper. These pivoted arms 25 easily swing inwardly and form no impediment to the infeed of material, which moves down the hopper by gravity over the lower sloped surface thereof. Also these arms work and function independently of each other as occasion requires. The arms or fingers 25 are spaced from the plane of movement of the knife 18 a distance approximately the average length of an ear of corn. Consequently these arms are in proper position to hold the ears against being pushed back into the hopper when the knife 18 is cutting them. Also, it is impossible for pieces of the cobs to be thrown out of the hopper.

The use and operation of the baffle gate mechanism, of course, is clear from the above description and need not be further amplified. It can be

seen that the desired objects heretofore recited are attained.

It is the intention to cover all changes and modifications which do not depart from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

1. The combination with a mill having a reducing chamber containing a rotor carrying a knife, a feed hopper including a throat portion and a sloping bottom for feeding material to a feed opening in the chamber, said bottom having its low end adjacent the feed opening, a shear bar in said throat cooperating with the knife to cut cobs, of a baffle mechanism in the hopper substantially occupying the entrance to the throat, said mechanism comprising a series of spaced independently swingable arms, said baffle mechanism being spaced from the shear bar a distance approximating the average length of a cob, the lower ends of said arms normally contacting the sloping bottom whereby under the press of infed material the arms may swing inwardly toward the chamber and the sloping bottom serving as a stop to limit movement of the arms in an opposite direction beyond their normal bottom contacting positions.

2. The combination with an upright mill having a reducing chamber enclosing a rotor operating on a horizontal axis, a feed hopper having a downwardly sloping bottom and terminating in a throat portion adjacent the low end of the bottom for feeding material by gravity through a feed opening formed in a side wall of the chamber, said hopper being disposed at substantially a right angle to the face of said wall whereby the material is fed to the face of the rotor, the bottom of said hopper being stationary, of a baffle mechanism in the hopper comprising means for carrying a plurality of independently movable, spaced, pivoted and pendently hung arms which normally substantially close the throat portion, said arms being free to swing inwardly toward the chamber feed opening under the press of feed of material moving down said bottom, the said stationary sloped bottom serving as a stop to limit swinging movement of the arms in a direction away from said chamber, said latter limiting action occurring when the lower ends of the arms strike said bottom.

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