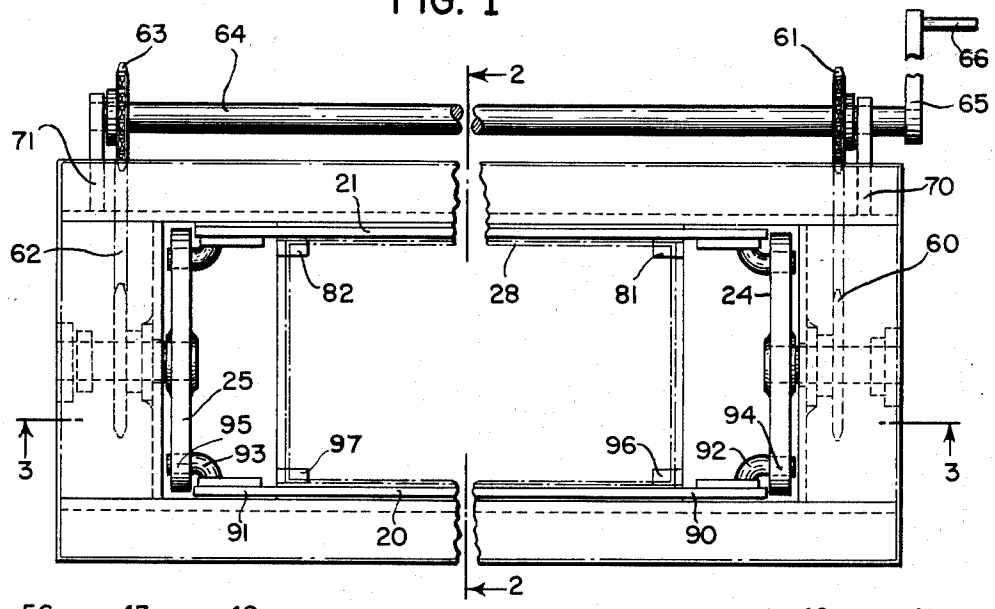
Sept. 9, 1952 A. J. LAYBERGER 2,609,996

HAMMER MILL FEED DELIVERY CHUTE, INCLUDING DUST GUARD

Filed Aug. 11, 1950 2 SHEETS—SHEET 1

FIG. 1



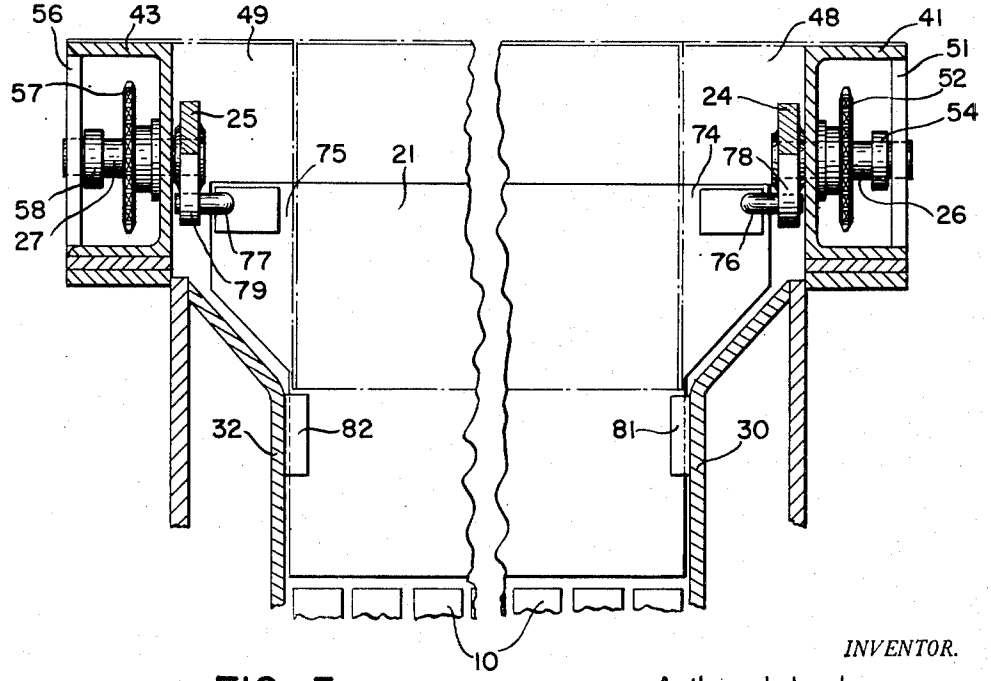


FIG. 3

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HAMMER MILL FEED DELIVERY CHUTE, INCLUDING DUST GUARD

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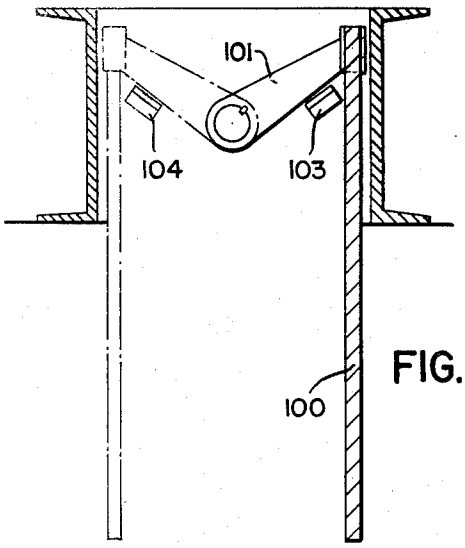


FIG. 4

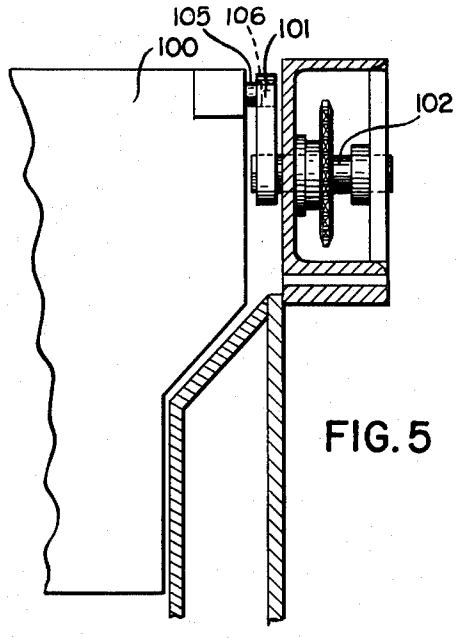


FIG. 5

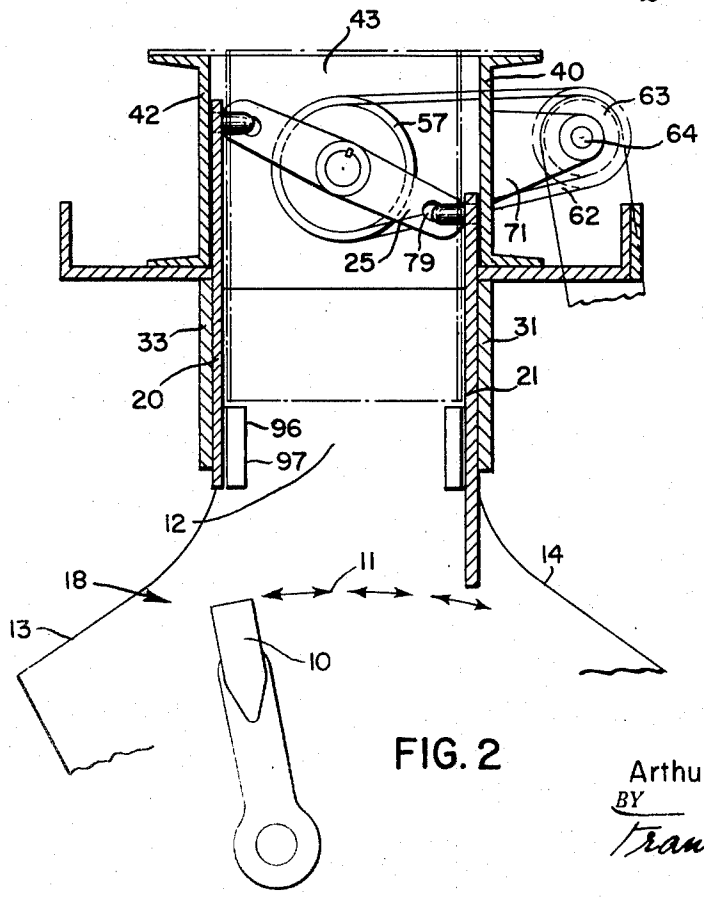


FIG. 2

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UNITED STATES PATENT OFFICE

2,609,996

HAMMER MILL FEED DELIVERY CHUTE, INCLUDING DUST GUARD

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Application August 11, 1950, Serial No. 178,798

6 Claims. (Cl. 241—186)

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This invention relates to a dust guard for a reversible type hammermill to intercept the material carried up, around and toward the supply chute by the hammers.

The object of this invention is to provide a hammermill crusher combining with the delivery chute a dust guard mechanism cooperating with the hammers and casing structure to intercept and divert this material and prevent it from being thrown upward toward the incoming supply.

Another object of this invention is to provide a dust guard that is inexpensive and durable in construction.

Other and further objects of this invention will appear from the following description taken in connection with the accompanying drawings of which

Fig. 1 is a top view of the machine;

Fig. 2 is a cross-sectional view of the machine along lines 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view along lines 3—3 of Fig. 1;

Fig. 4 is a fragmentary end view of another embodiment of the invention; and

Fig. 5 is a fragmentary side view of the other embodiment of the dust guard.

Referring to Figs. 1, 2 and 3 of the drawings there is shown the hammers 10 of a reversible type hammermill crusher mounted on a driven rotor (not shown) and subscribing a hammer circle 11 on rotation. A plurality of hammers are in each of the longitudinally extending rows as illustrated in Fig. 3. On each side of the rotating hammers are breaker surfaces 13 and 14 against which frangible material dropped through the delivery chute 12 are hit by the hammers and smashed against the breaker surfaces and shattered into smaller particles. Breaker surfaces are arranged on both sides of the delivery chute 12 and are spaced above the hammers 10 to form a breaker chamber 18. The breaker surfaces are shown schematically since the detail construction and arrangement of these surfaces varies with the type of material to be crushed and the size of crushed material desired. These surfaces are preferably of the same construction on each side of the delivery chute so that the machine may be operated in either direction with the same resulting action of the material against the breaking surfaces. The broken material is carried by the hammers around and down to screen bars (not shown) where the broken material is further crushed and dropped through the screen bar. However dust formed by the crushing process tends to remain within the machine

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and be carried upwards and thrown with the air currents into the breaking chamber and up into the delivery chute interfering with the incoming material and eventually escaping out of the top of the delivery chute into the atmosphere.

To prevent the dust and air currents from entering the breaker chamber 18 and delivery chute 12 a plate 21 is positioned in the breaker chamber 18 between the end of the breaker surface 14 adjacent the chute 12 and the incoming material and extends almost down to the hammer circle 11 as illustrated in Fig. 2. As the hammers 10 approach the chute on a counterclockwise rotation the end of the plate or dust guard 21 breaks the momentum of the dust and deflects the dust and air currents back into the hammer circle. The incoming material then drops substantially free from these disturbing currents and dust in front of the hammers 10.

When the rotor is turned clockwise the plate 21 is raised and the plate 20 is lowered into the breaker chamber preferable between the breaker surfaces 13 and the incoming material, and extending almost to the hammer circle 11. Thus a dust guard is provided for clockwise rotation to interrupt the returning dust and air currents and deflect them into the hammer circle.

The plates 20 and 21 are mounted within the delivery chute 12 and are suspended from rocker arms 24, 25 mounted on rotatable shafts 26, 27. The delivery chute is of a rectangular shape in cross-section extending the entire length of the crusher. The side walls are formed by the longitudinally supporting beams 40, 42 and side plates 31, 33. The end walls are formed by the plates 30, 32 flared outwardly at their upper ends to form recesses 48, 49 for the rocker arms 24, 25. A rectangular shaped sleeve 28, shown in phantom by the dot and dash lines in Figs. 1 and 2, is positioned between the plates 20, 21 and the recesses 48, 49 and extends down to the end walls 30, 32 isolating the recesses 48, 49 with the rocker arms 24, 25 from the incoming material.

The rocker arm 24 is journaled in and supported by the beam 41 and the member 51. A drive gear 52 is mounted on the shaft outside of feed chute 12 to turn the shaft 26. A safety set collar 54 is mounted on the shaft to bear against the member 51 to hold the shaft 26 with the gear 52 from excessive axial movement. The shaft 27 is similarly mounted in the end member 43 and the supporting member 56. A drive gear 57 for turning the rocker arm 25 is mounted on the shaft outside of the feed chute. The safety set

collar 58 and the drive gear 57 holds the shaft 27 from excessive axial movement.

The drive gears 52, 57 are each respectively driven by the chains and sprockets 60, 61, and 62, 63 mounted on the shaft 64 that is turned by the crank 65 and handle 66. The shaft 64 is journeled in supports 70, 71 rigidly fastened to the member 40.

The plate 21 is rectangular shape sheets of metal with side portions 74, 75 and is pivotally supported by pins 76, 77 rigidly secured to the extensions 74, 75 respectively and rotatably fitting into the slots 78, 79 of the arms 24, 25 respectively. The plate 21 slides along the longitudinal side wall of the delivery chute guided by the projections 81, 82 secured below the flared portion to the end walls 30, 32 respectively. As the rocker arms 24, 25 are turned by the crank 65, handle 66 and the plate 21 slides along the wall and the pins 76, 77 of the plate slide in the slots 78, 79 of the arms. The end of the plate 21 would then be above the breaker chamber and the rotor is free to revolve counterclockwise knocking the incoming material against the breaker plates 13.

Plate 20 of a rectangular shape with extensions 90, 91 is similarly suspended from the other end of rock arms 24, 25. Pins 92, 93 are securely fastened to the opposite corners of the extensions 90, 91 respectively and are pivotally mounted in the slotted opening 94, 95 of the rocker arms 24, 25 respectively. As the rocker arm is turned the plate 20 slides up or down in the guides 96, 97 extending the lower edge into the breaker chamber almost down to the hammer circle.

This arrangement provides for a balanced structure around the shafts 26, 27 so that in shifting the plates only the frictional resistance and inertia of the parts need be overcome. However a single plate may be used as shown in Figs. 4 and 5.

In Figs. 4 and 5 another embodiment of the invention is shown instead of having plates on each side of the chute a single plate may be suspended from crank arms and swing from one side of the chute to the other on the reversal of the rotation of the hammer. In Fig. 4 the suspension of one end of the plate is shown with the crank arm 101 mounted on a shaft 102 and plate 100 pivotally mounted at the outer end of the crank arm. A pin 105 supporting the plate is fixedly mounted in the end of the plate 100 and rotatably fits into a hole 106 in the crank arm so as the crank arm is shifted from one position to the other the plate 100 remains vertical. The plate 100 extends into the breaker chamber almost to the hammer circle forming a dust guard. The rotation of the crank arms is limited by the stops 103, 104 upon which the crank arm rests and supports the plate in position. The stops are mounted on the end walls of the delivery chute. The plates may be shifted from one side to the other by the same means that shifts the rocker arms.

I claim:

1. In a hammermill having a delivery chute having walls forming a passage centrally positioned above a rotor and feeding frangible material between hammers on said rotor to crush the frangible material against breaker plates symmetrically located on both sides of said feed chute and above said hammers to form a breaker chamber between said hammers and said plates, a dust guard comprising rocker arms mounted on opposite walls of the delivery chute each rotatably mounted at one end and at the other end pivotally supporting a plate along a longitudinal wall of the delivery chute positioned to extend into the breaker chamber between the delivery chute passage and breaker plates on the rotation of the rocker arms to form a deflecting barrier between the approaching hammers and the incoming material.

2. A dust guard for a hammermill having a delivery chute centrally spaced over a reversible rotor with hammers thereon and having breaker plates on both sides of the exit of said chute comprising two plates on opposite sides of said chute extendible toward said rotor up to and adjacent the periphery of the rotating hammers, rocker arms rotatably mounted at a central point thereof and pivotally and slidably supporting said plates at opposite ends of said rocker arms to alternately raise one plate while lowering the other plate to correspond to the direction of rotation of the hammers.

3. A dust guard for interrupting the return of air and dust into the delivery chute of a reversible rotor with peripheral hammers and breaker plates spaced above said hammers comprising a plate positioned along the inside of the chute and extendible up to the periphery of the rotating hammers, a crank arm at each end of said plate pivotally supporting said plate at the rotating end to readily shift the plate from one side of the delivery chute to the other side and extending into the space between the hammers and the periphery of the rotating hammers.

4. A dust guard as claimed in claim 2 wherein the sides of the chute at the ends of the plates have recesses and the rocker arms are mounted in the recess clear of the material passing through the delivery chute.

5. A dust guard as claimed in claim 4 wherein the plates have portions extending into the recesses.

6. In a hammermill having a delivery chute with end walls and longitudinal walls centrally positioned above a reversible rotor and feeding frangible material between the hammers on said rotor, said rotor crushing the frangible material against breaker plates cylindrically located on both sides of said feed chute and above said hammers to form a breaker chamber between said hammers and said plates, a dust guard for deflecting the returning dust and air currents within the periphery of the rotating hammers having a plate within said chute and extending along a longitudinal wall with a dust deflecting lower portion positionable within said breaker chamber adjacent the breaker plates on one side of said chute and having the lower edge of said plate adjacent the hammer circle to deflect the dust and air currents within the rotor, a crank arm within said chute mounted on the end walls thereof and pivotally connected to the upper end of said plate to remove the lower portion from adjacent said breaker plates to permit the crushing of the frangible material against said breaker plates on reversal of the rotor.

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