Sept. 2, 1952 J. BROUGH 2,609,152

VERTICALLY ARRANGED HAMMER MILL

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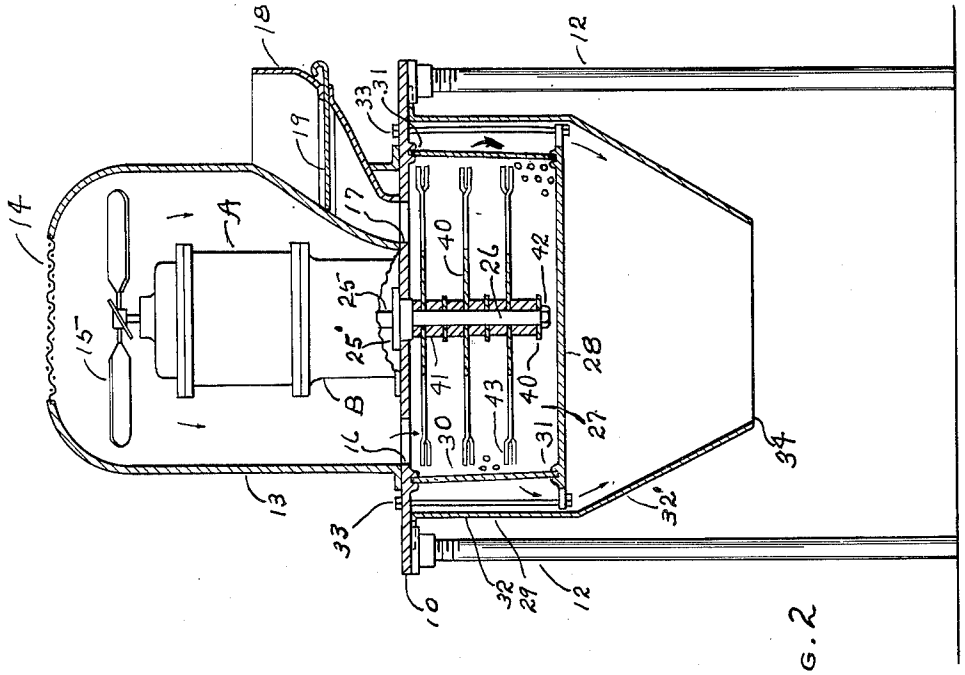


FIG. 2

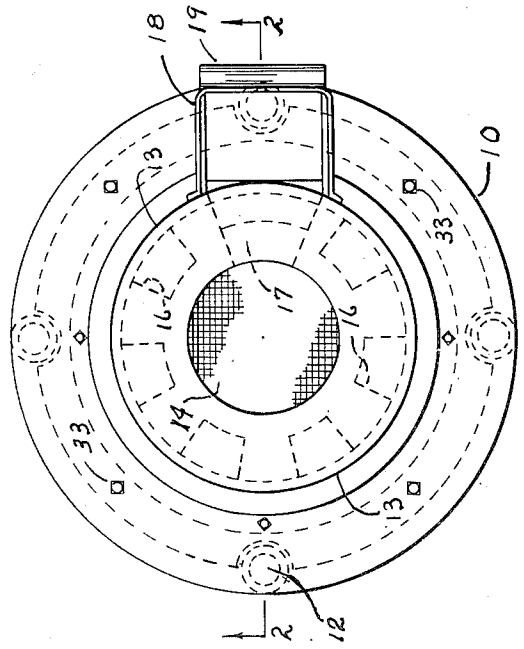


FIG. 1

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VERTICALLY ARRANGED HAMMER MILL

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1 Claim. (Cl. 241—51)

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The present invention relates to a hammer mill with the motor and mill direct coupled and positioned vertically, the motor having a fan for creating a down draft through the mill for carrying the ground material out of the mill into a discharge outlet or tube.

Objects of the present invention are to provide a mill which is simple, easily manufactured at low cost and efficient.

A further object of the present invention is to provide a vertically arranged hammer mill with a circular screen presenting for action a complete circle of 360° F. thus to increase the capacity relative to the size of the mill, whereas the conventional hammer mill screen includes only half of a circle.

A still further object of the present invention is to provide a mill which will, because of the position and shape of the screen, grind the material more uniformly.

To these and other useful ends my invention consists of parts, combinations of parts or their equivalents and mode of operation as hereinafter described and claimed and shown in the accompanying drawings in which:

Fig. 1 is a top view of my improved hammer mill.

Fig. 2 is a partially vertically sectioned view taken on the line 2—2 of Fig. 1.

As thus illustrated, my device comprises a driving motor which is in its entirety designated by reference charcater A, having a pedestal B which is secured to a frame plate 10, the plate being mounted preferably on a number of spaced supporting legs 12. I provide a housing or cover 13 for motor A with a screened opening 14 in its top. Motor A is provided with a fan 15 which is secured to the protruding end of the motor shaft, the fan being adapted to force a current of air downwardly around motor A as indicated by arrows and through a number of spaced openings 16 which are arranged concentric with the motor, one of the openings being omitted, at which point an outlet opening 17 is provided for feed hopper 18, this hopper being provided with preferably a slide valve 19 by which the flow of material into the mill may be regulated. Motor A is provided with an armature shaft 25 which is operatively connected to or forms a part of the mill shaft 26 which extends downwardly and substantially through mill chamber 27 as shown and being supported in a bearing 25'. A plate 28 forms the bottom closure for chamber 27. This plate is suitably anchored to frame plate 10 by means of a number of bolts 29 which are arranged circumferentially and adapted to firmly hold plate 28, in position relative to plate 10. I provide a circular screen 30, the edges of which are anchored within channels 31—31 on members 10 and 28. This screen may be made integral from a single piece or in sections of suitable lengths for completing the circle.

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Any convenient means may be provided whereby these screens may be removed and replaced. Generally plate 28 is removed for this purpose. It will be noted that the parts forming chamber 27 are very simple and inexpensive and easily inspected by simply removing an outlet housing 32 which is supported on plate 10 by means of suitable bolts as at 33. Housing 32 is circular and positioned concentric with shaft 26, its bottom converging as at 32' terminating in an opening as at 34 or being connected direct to a delivery tube or sacker. Member 32 is somewhat larger than screen 30 so there is a free passageway for the ground feed as it leaves the screen.

The operating parts of the mill comprise a number of arms 40 which are arranged alternately at right angles with each other and spaced apart by means of sleeves 41, the assembly being held together by means of a nut 42, arms 40 being held in position by friction or they may be keyed to shaft 26. Arms 40 at their ends are preferably split for a short distance and freed parts 43 are offset as indicated.

As thus shown and described it will be seen that applicant's device can be made sturdy, at low cost and that it will be very efficient and have a high capacity per weight because of the large area of the screen and the shape and position of arms 40.

From the foregoing, it will be seen that my device is particularly adapted for small size mills and will in the nature of things provide a small mill with efficiency comparable to large mills and at a cost which when considered from a capacity standpoint, is comparable to conventional large mills.

Clearly minor detail changes may be made in the design shown without departing from the spirit and scope of my invention as recited in the appended claim. For example, member 28 may be made slightly smaller in diameter at the bottom and the screen slightly cone so as to slightly urge the material upward.

Having thus shown and described my invention, I claim:

A hammer mill of the character described comprising in combination, a horizontally arranged frame plate, a vertically arranged motor concen-

trically mounted on the upper side of said frame plate, fan blades mounted on the upper end of the shaft of said motor and adapted to move air downwardly, the lower end of the shaft of said motor protruding for a distance through said frame plate, a generally circular in cross section housing for said motor and concentric therewith and mounted on the top of said frame plate and forming an air passageway around the motor, a number of ports in said frame plate and circumferentially spaced between the mounting of said motor and housing, one of said ports adapted to act as a feed passageway port and the others being adapted to act as air outlets from said housing, said housing being extended inwardly to partially surround said feed passageway port, a feed inlet member adapted to cooperate with said housing inwardly extending portion to form a feed hopper, a circular plate having a diameter substantially equal the diameter of said housing and being secured a distance below said frame plate by means of a number of spaced bolts, a circular screen detachably mounted between said frame plate and circular plate having a diameter substantially the general diameter of said housing cooperating with said frame and circular plate to form a hammer chamber, a number of vertically spaced hammer arms mounted on said protruding end of the motor shaft, a circular outlet duct having a diameter somewhat larger than said circular plate and extending downwardly from the frame plate past the circular plate forming an outlet for the ground feed.

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