

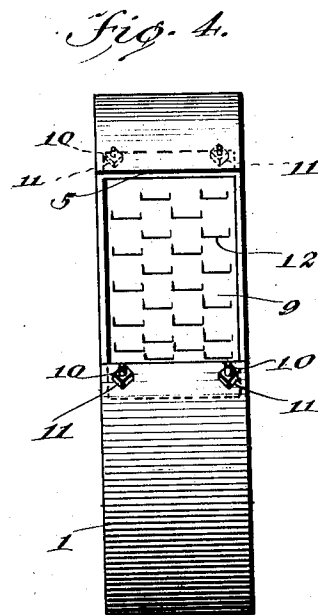
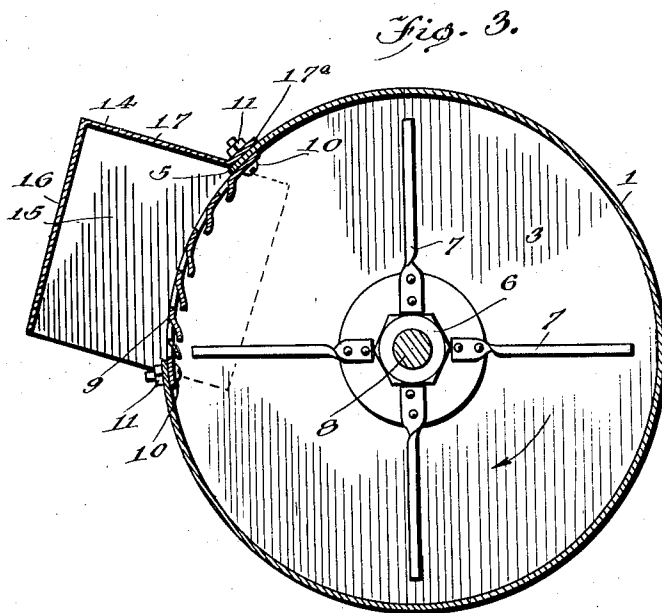
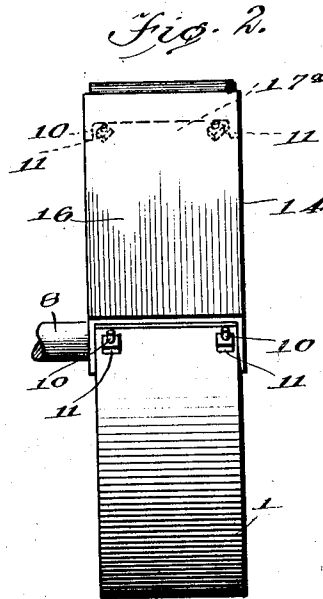
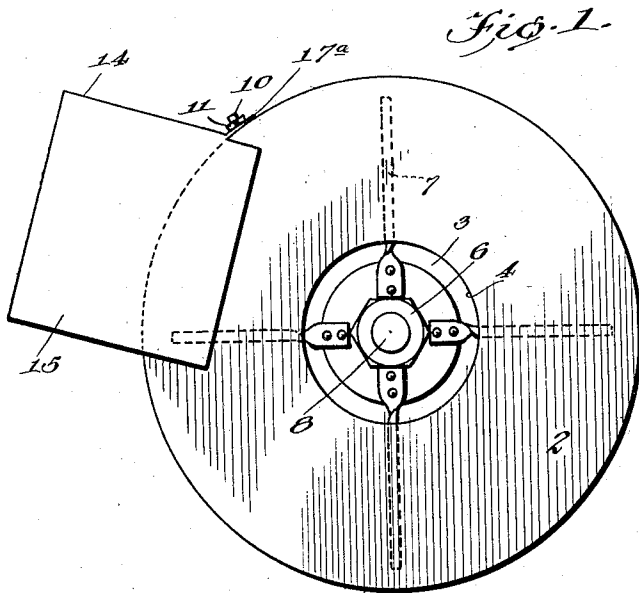
Jan. 12, 1926.

G. E. MILLER
MACHINE FOR GRINDING GRAIN

Filed Nov. 25, 1924

2 Sheets-Sheet 1

1,569,561



WITNESSES

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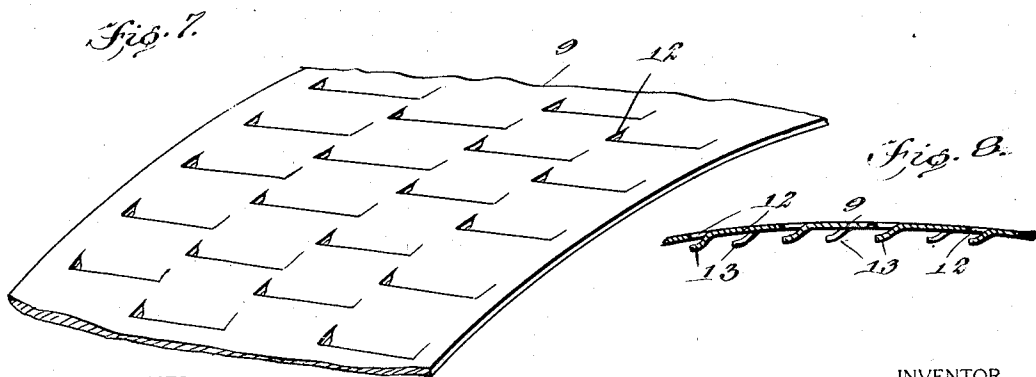
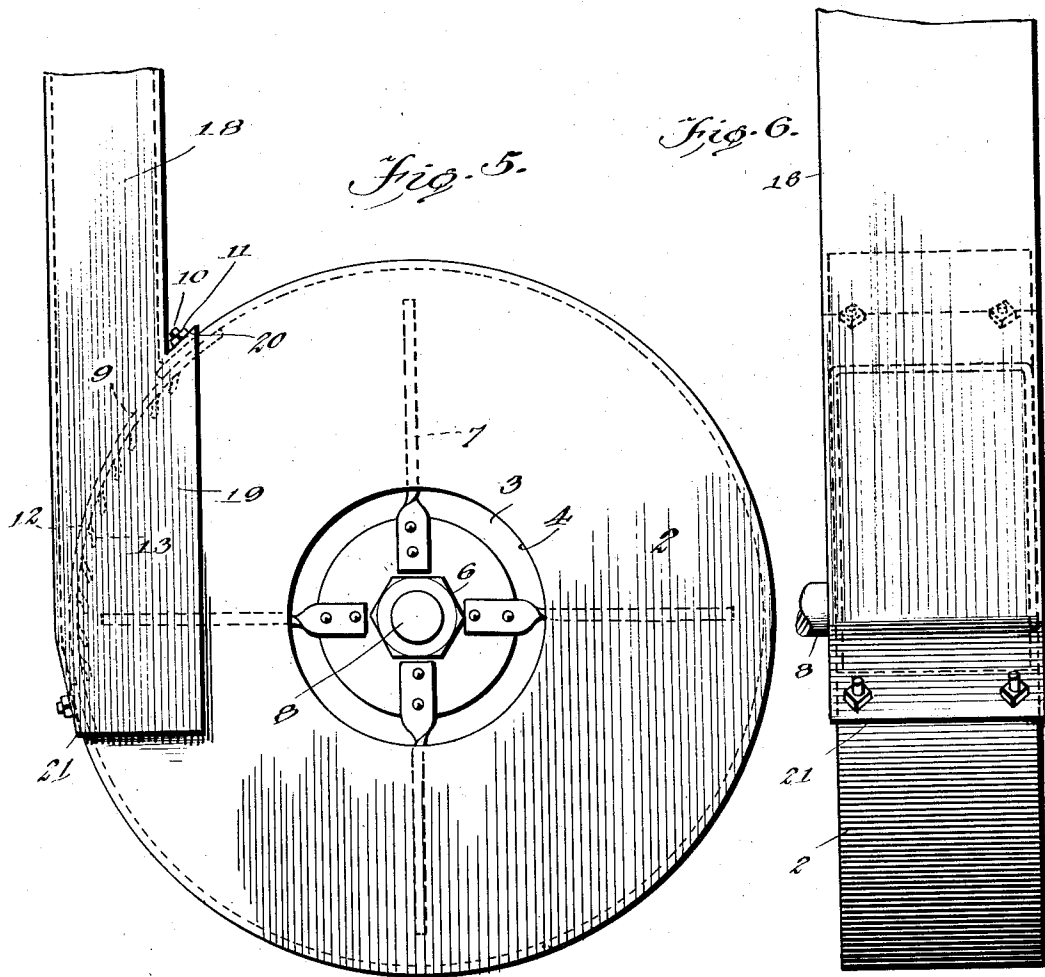
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MACHINE FOR GRINDING GRAIN

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2 Sheets-Sheet 2



WITNESSES

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Patented Jan. 12, 1926.

1,569,561

UNITED STATES PATENT OFFICE.

GUSTAF E. MILLER, OF STRATTON, NEBRASKA.

MACHINE FOR GRINDING GRAIN.

Application filed November 25, 1924. Serial No. 752,172.

To all whom it may concern:

Be it known that I, GUSTAF E. MILLER, a citizen of the United States, and resident of Stratton, in the county of Hitchcock and State of Nebraska, have invented certain new and useful Improvements in Machines for Grinding Grain, of which the following is a specification.

My invention relates to improvements in machines for grinding, cracking or crushing grain, for feed or other purposes, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of the invention is to provide a simple, reliable and efficient machine of the character described which affords facilities for grinding, cracking or crushing grain rapidly and uniformly.

A further object of the invention is the provision of a machine of the character described which will discharge the ground, crushed or cracked grain for delivery to any desirable place.

Other objects and advantages will be apparent from the following description, considered in conjunction with the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying the invention, showing a feed deflecting hood associated with the outlet thereof,

Figure 2 is an elevation of the structure exhibited in Figure 1, the view being taken at right angles to Figure 1,

Figure 3 is a transverse vertical section through the structure exhibited in Figure 1,

Figure 4 is a view similar to Figure 2, with the hood omitted,

Figure 5 is a side elevation of the machine with a feed elevating conduit associated with the outlet thereof,

Figure 6 is an elevation of the structure exhibited in Figure 5, the view being taken at right angles to Figure 5,

Figure 7 is a fragmentary perspective view of the grating which is preferred by me for use at the outlet of the casing of the machine,

Figure 8 is a longitudinal vertical section through the grating.

In carrying out the invention I provide a substantially drum-shaped casing comprising a substantially cylindrical body 1 provided at its opposite ends with end members 2 and 3 respectively. The end mem-

ber 2 is formed with a central circular opening 4 which constitutes the inlet of the casing. The cylindrical body 1 is provided with an opening 5 which preferably terminates at its lower end at about the level of the axial line of the casing. A fan 6 having radial blades 7 which terminate at their outer ends in proximity to but short of the inner wall of the cylindrical body 1 is rotatably supported within the casing in concentric relation to the latter in any suitable known manner, as by being secured on a shaft 8 which extends into the casing through a central opening in the end member 3, the shaft being rotatable and terminating within the casing short of the plane of the end member 2, as is usual in blower fan constructions.

The outlet opening 5 is covered by a grating 9 which may have the marginal edge portions thereof disposed against the inner face of the portion of the cylindrical body 1 which margins the outlet opening 5 but which obviously may be disposed in a like position at the outer side of the cylindrical body. The grating 9 is attached to the cylindrical body by bolts 10 and nuts 11, the bolts 10 extending from within the casing through aligned openings in lapped portions of the grating and cylindrical body and the nuts being screwed on the outer ends of the bolts, as shown. The bolts 10 and of course the nuts therefor may vary in number as desired. In the drawings, I show two bolts 10 at the upper end of the outlet opening and two bolts 10 at the lower end of the outlet opening but obviously I may make use of a greater or less number of bolts, if desired.

I prefer to make use of a grating 9 having perforations 12 formed therein by striking portions of the grating body inwardly to form guard lips indicated at 13 for the respective perforations 12. The end portions of the guard lips 13 are disposed in offset relation to the body of the grating and radially inward of the perforations 12 so that the guard ribs prevent flow in a straight radial direction from the space within the casing through the perforations but permits entrance to the perforations 12 from the interior of the casing at one side. The guard lips 13 are turned within the casing in the direction opposite to that of the rotation of the fan so that the end edges of the guard lips will face the blades of the

rotating fan as they are swung in the arc of a circle within the casing by the rotation of the fan.

While the grating just described is that preferred by me, I do not wish to be restricted to the use of the specific grating but can make use of gratings or screens of various descriptions and having perforations of various sizes and configurations and each provided with a guard lip or without a guard lip, as will be more fully understood from the following recitation of the operation of the machine.

The operation of the machine is substantially as follows: The grain that is to be ground, cut, cracked or crushed to provide feed is fed into the space within the casing through the inlet opening 4 and is struck by the fan blades. Any suitable known means may be employed to feed grain through the inlet opening 4, and I therefore have not illustrated or described any particular means for feeding the grain through the opening 4 into the casing of the device. The impact of the quickly moving fan blades on the grain tends to break or cut the individual grains and as the fan rotates the whole grains and the portions of grain are thrown at high velocity against the grating and will be further broken and cracked because of the impact thereof against the grating, particularly in view of the provision of the guard lips at the inner side of the grating. The portions of grain which are sufficiently small to pass through the apertures 12 will be forced therethrough as the fan rotates, both because of pressure thereagainst as other grains are thrown and pushed outwardly against the grating by the fan blades and because of the force of the air blasts which are caused by the rotation of the fan in the casing. The grains which are not broken or ground between the rotating fan blades and the grating sufficiently small to pass through the perforations 12 as a result of the initial impact with the grating will be carried around within the casing by the rotating fan and will be thrown and pressed against the grating 10 until they are sufficiently small to pass outward from the casing through the perforations 12.

The matter which passes through the perforations 12 may be deflected or conducted to any desirable place. In Figures 1 to 3 inclusive, I show a deflecting hood, indicated generally at 14, which is attached to the casing of the device in position to deflect the matter which passes through the perforations 12 downwardly. The hood may comprise a pair of parallel side members 15 which straddle the ends of the casing at the sides of the openings 5 and are connected at their outer ends by an end member 16 and at their upper ends by a top member 17. The outer end members 16 and the top mem-

ber 17 may be integral with the side members 15 and also may be joined integrally with one another, as shown. The top member 17 is separated from the side members 15 for a slight distance from the inner end of the hood by incisions which extend along the side edges of the top member from the inner end of the latter, thus providing an attaching end portion 17^a which is secured to the body 1 of the casing of the device by the same bolts and nuts 10 and 11 respectively which are used to secure the upper end portion of the grating 9 to the body 1.

With the arrangement just mentioned, matter passing through the perforations 12 into the hood will be deflected downwardly through the opening between the lower ends of the outer end members 16 and the side members 15 of the hood and the adjacent portion of the body 1 of the device. The hood proper can be bent relatively to the attaching portion 17^a along the line of juncture of the attaching portion 17^a with the major portion of the top member 17 to vary the distance between the lower end of the outer end member 16 and the proximate portion of the body 1 of the casing, whereby both the direction of deflection of the matter passing from the hood and the effective area of the opening through which matter passes from the hood downwardly can be varied within a considerable range.

In Figures 5 and 6, I show an arrangement for conducting the matter which passes through the perforations 12 upwardly from the casing of the device. To this end, I make use of a tubular conduit 18 which is slitted and opened out for a short distance from its lower end to provide a pair of side flaps 19 which are arranged in straddling relation to the ends of the casing of the device at the side of the opening 5. Vertical walls of the conduit 18 are bent to position to closely overlie the body 1 both above and below the opening 5, as indicated at 20 and 21 respectively and are secured to the body 1 of the casing by the same bolts and nuts which are used to secure the grating 9 to the body of the casing. Matter passing through the perforations 12 will be blown upwardly through the conduit 18 by the wind blasts from the fan 6 through the conduit 18 which of course may lead to any desirable place.

For example, the machine can be used for elevating grain without grinding, crushing or cracking it. For this use of the machine, the construction exhibited in Figures 5 and 6 with the grating 9 omitted is employed, the grain being blown from the fan casing through the elevating conduit 18 to any desired place.

Obviously, my invention is susceptible of embodiment in forms other than those illustrated in the accompanying drawing and I

therefore consider as my own all such modifications and adaptations of the forms of the device herein described as fairly fall within the scope of the appended claims.

5 I claim:—

1. A device of the character described comprising a casing having a substantially cylindrical body and end members at the ends of the body, one of said end members having a central inlet opening, said cylindrical body being formed with an outlet opening, a fan mounted to rotate within said casing in concentric relation to said cylindrical body, the ends of the blades of the fan passing in proximity to the inner wall of the cylindrical body but being spaced from the latter, and a grating covering said outlet opening, said grating comprising a plate having portions struck inwardly therefrom at intervals throughout its area to provide perforations and inwardly extending guard lips for the perforations, each of said guard lips having the free end thereof facing the outer end portion of each blade of the fan as that blade is moved close to the outlet opening of the casing during the rotation of the fan.

2. A device of the character described comprising a casing having a substantially cylindrical body and end members at the ends of the body, one of said end members having a central inlet opening, said cylindrical body being formed with an outlet opening, a fan mounted to rotate within said casing in concentric relation to said cylindrical body, the ends of the blades of the fan passing in proximity to the inner wall of the cylindrical body but being spaced

from the latter, and a grating covering said outlet opening, said grating comprising a plate having portions struck inwardly therefrom at intervals throughout its area to provide perforations and inwardly extending guard lips for the perforations, each of said guard lips preventing radial movement of matter from the center of the casing through said perforations but permitting entrance to said perforations from the space within the casing in a direction extending obliquely to radial lines from the center of the casing to said perforations.

3. A machine of the character described comprising a fan casing having an outlet opening in the periphery thereof and having a lateral inlet, a fan mounted to rotate within the casing, a grating covering the outlet opening, and a hood attached to said casing in position to deflect matter passing from the perforations of the grating downwardly from the casing, the body of said hood being adjustable in respect to the casing to vary the direction of deflection of said matter from the hood and to vary the effective area of the space within said hood between adjacent walls of the hood and fan casing.

4. In a device of the character described, a grating comprising a plate having portions struck laterally thereof at intervals throughout the area of the plate thus providing perforations and guard lips therefor, the free end portions of said guard lips being disposed in offset relation to the body of the plate and partly covering said perforations.

GUSTAF E. MILLER.