April 10, 1928. 1,666,014

J. H. KERSHNER

GRINDER CUTTER

Filed Aug. 31, 1925 2 Sheets-Sheet 1

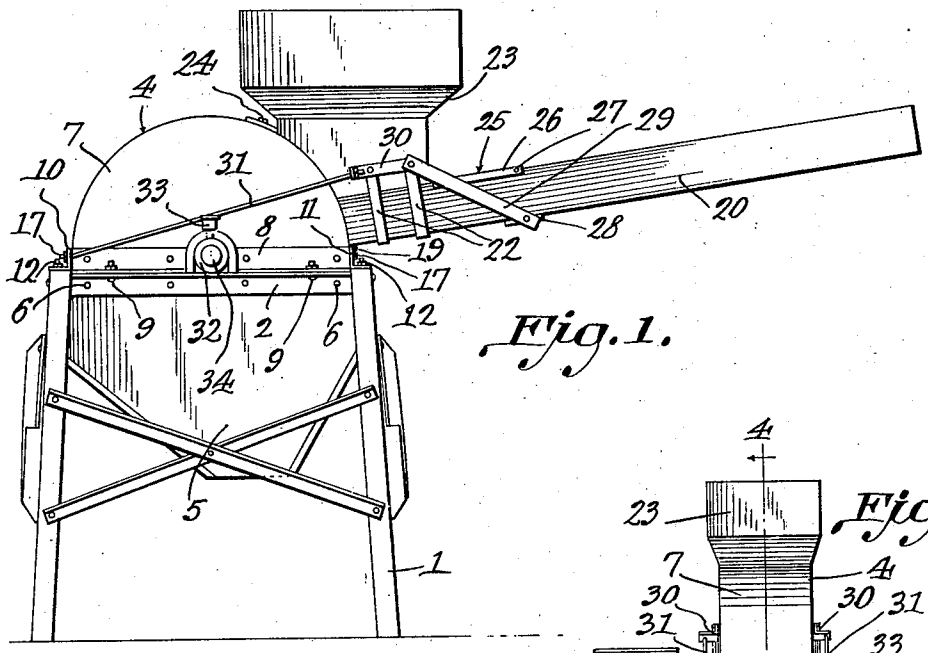


Fig. 1.

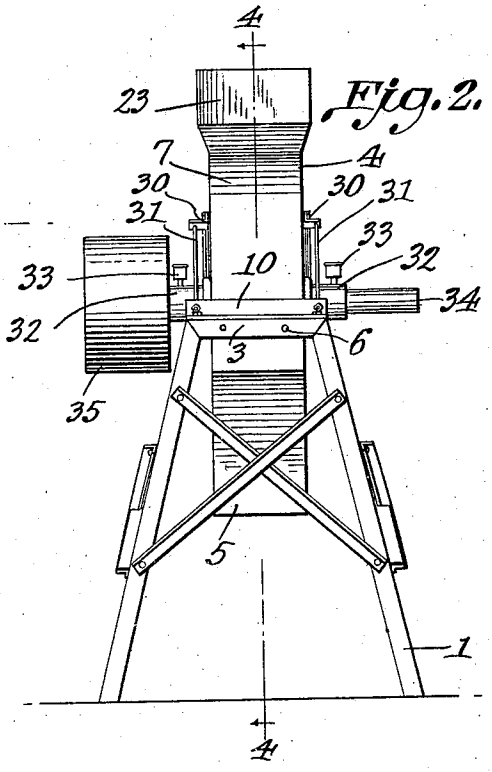


Fig. 2.

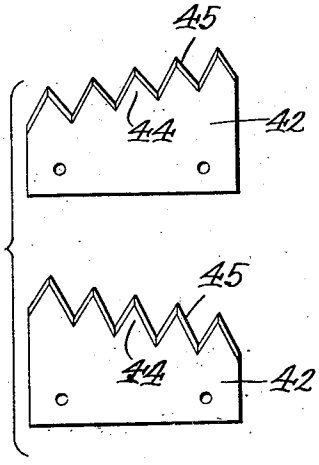


Fig. 3.

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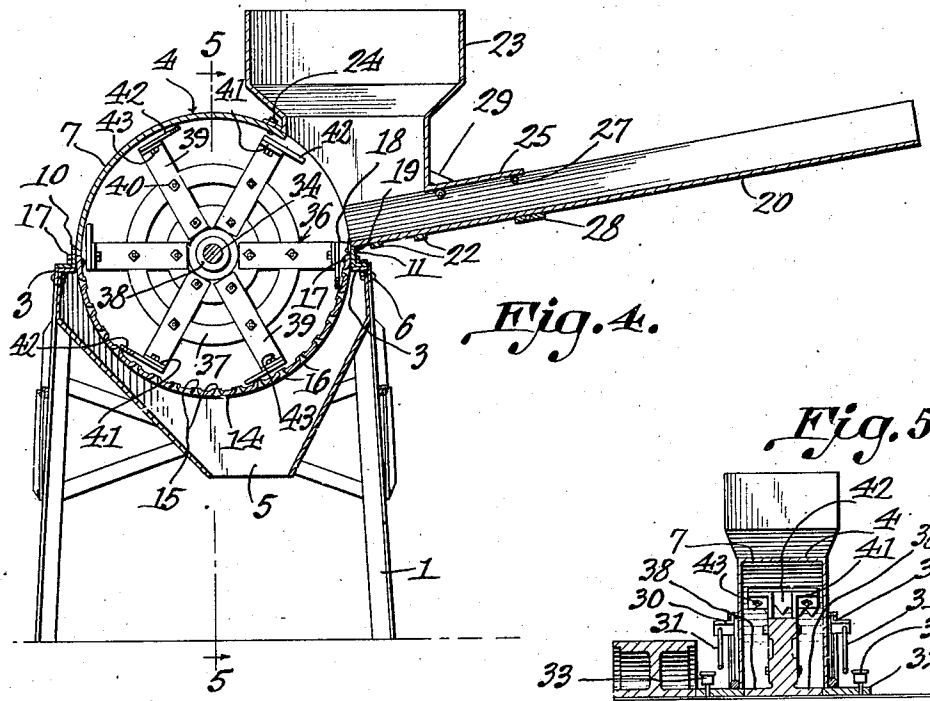


Fig. 4.

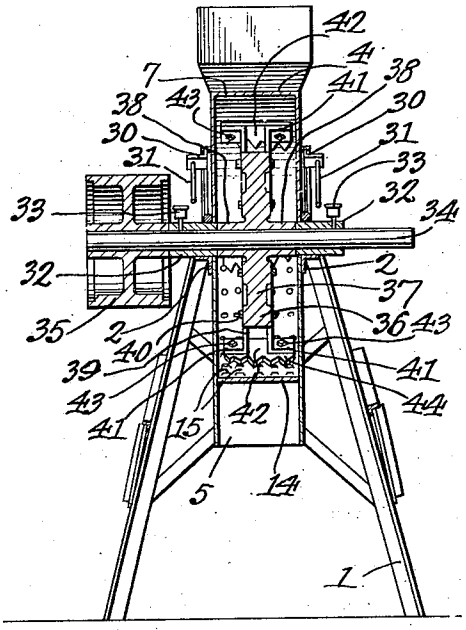


Fig. 5.

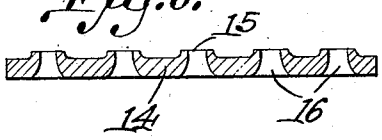


Fig. 6.

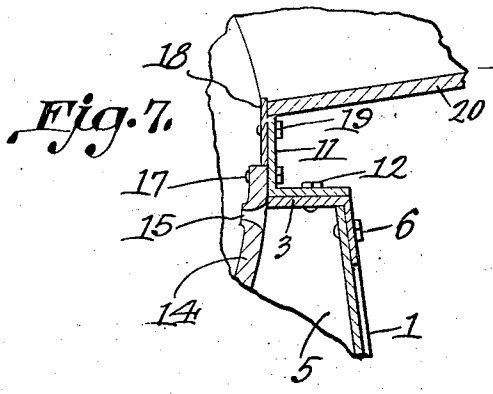


Fig. 7.

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UNITED STATES PATENT OFFICE.

JOHN HENRY KERSHNER, OF NORTON, KANSAS.

GRINDER CUTTER.

Application filed August 31, 1925. Serial No. 53,637.

This invention aims to provide a simple but effective means whereby, in a single machine, stuff such as ensilage may be cut, it being possible, also, to grind feed in the machine.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:—

Figure 1 shows in side elevation, a device constructed in accordance with the invention; Figure 2 is an end elevation; Figure 3 is a diagrammatic view illustrating the relation which exists between the working edges of adjacent blades on the rotor; Figure 4 is a section taken about on the line 4—4 of Figure 2, parts remaining in elevation; Figure 5 is a section taken about on the line 5—5 of Figure 4; Figure 6 is an enlarged sectional view showing a portion of the concave; Figure 7 is a sectional view enlarged from Figure 4.

In carrying out the invention, there is provided a frame 1. So far as material to the present discussion, the frame includes end bars 3 and side bars 2. The frame 1 carries a housing 4. The housing 4 embodies a discharge spout 5 secured at 6 to the side bars 2 and to the end bars 3 of the frame 1. The housing 4 embodies a cap 7 of approximately semi-circular shape. The cap 7 has side cleats 8 secured by bolts 9 or otherwise to the side bars 2 of the frame 1, the cap thus being removable. Angle brackets 10 and 11 are secured at 12 to the respective end bars 3 of the frame 1. A removable concave 14 is provided. The concave 14 is located in the spout 5 and has inwardly projecting burrs 15. The openings through the burrs 15 flare at their outer ends, as shown at 16, so that the ground material may free itself readily. Securing elements 17 connect the ends of the concave 14 with the brackets 11. A fixed blade 18 is secured at 19 to the bracket 11 and is disposed above the intake end of the concave 14.

The numeral 20 marks an inclined chute which discharges into the housing 4, across the blade 18, and at the intake end of the concave 14. The chute 20 is connected by U-shaped straps 22 to a hopper 23. The hopper 23 discharges partly onto the chute 20 and partly into the housing 4, as shown most clearly in Figure 4. The hopper 23 has a flange that is connected by securing elements 24 to the upper part of the cap portion 7 of the housing. A cover plate 25 extends from the lower end of the hopper 23 over a portion of the chute 20, the cover plate having flanges 26 which are connected at 27 to the side walls of the chute. A cross piece 28 is connected to the bottom of the chute 20. Inclined supports 29 extend between the cross piece 28 and one of the straps 22, the straps 22 being joined by anchor strips 30 which form places of attachment for adjustable ties 31, such as bolts, the same being mounted at their outer ends in the angle bracket 10.

Bearings 32 are secured to the side bars 2 of the frame 1 and carry dope cups 33 for the lubrication of a shaft 34 which is journaled in the bearings 32. Any suitable means 35 may be provided whereby rotation may be imparted to the shaft 34. The shaft 34 carries a rotor 36 located in the housing 4 and cooperating with the concave 14. Rotor 36 includes a disk-like body 37 having lateral hubs 38, arms 39 being secured removably at 40 to opposite sides of the body 37, the arms 39 having lateral fingers 41 to which blades 42 are attached by securing devices 43, removably. The blades 42 project, generally stated, circumferentially of the rotor, and the edges of adjacent blades being inclined in opposite directions, transversely of the rotor, as Figure 3 will clearly show, those edges of the blades being provided with teeth 44, which are sharpened upon their edges, as shown at 45.

If ensilage or the like is to be cut, the concave 14 preferably is removed, the ensilage being fed along the chute 20, the edges 45 of the teeth 44 of the blades 42 on the rotor 36 cooperating with the fixed blade 18 to sever the material, the material passing downwardly and outwardly, through the spout 5. In the event that material is

to be ground, the concave 14 remains in place. The material to be ground can be dumped directly into the housing 4 through the hopper 23, or, if desired, it can be fed in through the chute 20. When the rotor 36 is in operation, the blades 42 carry the material over the burrs 15 of the concave 14, the finely divided material flowing downwardly through the flared openings 16 of the concave.

Because the working edges of the blades 42 are inclined in opposite directions transversely of the rotor, because the said edges have teeth 44, and because the edges of the teeth are sharpened as at 45, a very effective cut is secured when the blades 42 of the rotor cooperate with the fixed blade 18: and, furthermore, because the blades 42 are constructed as described, those blades, in combination with the burrs 15 of the concave 14, are peculiarly efficient, the material being moved laterally from side to side, torn by the teeth 44, rubbed by the burrs 15 and cut by the edges 45 of the teeth. Owing to the way in which the working edges of the blades are inclined, sharpened, and toothed, the benefit of a draw cut is obtained, and at the same time, the material is worked toward the center of the chute 23, or toward the center of the chute 20, and a clogging at the sides of the chute is avoided. It has been found by experiment that a machine embodying the features above described with respect to the knives or blades, will operate with approximately 25% less power than is required when the shape of the blades or knives is changed from that shown in Figure 3 of the drawings.

I claim:—

1. In a device of the class described, a support, a chute carried by the support, a fixed blade at the inner end of the chute, and a rotor journaled on the support and provided with circumferentially extended blades coacting with the fixed blade, the working edges of adjacent blades on the rotor being inclined in opposite directions transversely of the rotor thereby to obtain the benefit of a draw cut, and to keep the material centralized with respect to the chute and to avoid a crowding of the material at either side of the chute.

2. In a device of the class described, a support, a chute carried by the support, a fixed blade at the inner end of the chute, and a rotor journaled on the support and provided with circumferentially extended blades coacting with the fixed blade, the working edges of adjacent blades on the rotor being inclined in opposite directions transversely of the rotor, said edges being provided with teeth, the above-defined construction of the working edges of the blades being such that a draw cut will be effected and, at the same time, the material will be centralized with respect to the chute, to prevent a crowding of the material at the sides of the chute.

3. In a device of the class described, a support, a chute carried by the support, a fixed blade at the inner end of the chute, and a rotor journaled on the support and provided with circumferentially extended blades coacting with the fixed blade, the working edges of adjacent blades on the rotor being inclined in opposite directions transversely of the rotor, those edges being provided with teeth, and the edges of the teeth being sharpened, the aforesaid construction of the working edges of the blades being such that a draw cut will be effected, and, at the same time, the material will be centralized with respect to the chute, thereby to avoid a crowding at the sides of the chute.

4. In a device of the class described, a support, a concave on the support and having inwardly projecting burrs, a chute, a rotor cooperating with the chute journaled on the support and supplied with circumferentially extended blades coacting with the burrs, the working edges of the adjacent blades being inclined in opposite directions transversely of the rotor, the aforesaid inclination of the edges of the blades operating to afford a draw cut and to cause the material to be advanced toward the center of the chute, thereby avoiding a clogging at the sides of the chute.

5. In a device of the class described, a support, a concave on the support and having inwardly projecting burrs, a chute discharging on the concave, and a rotor journaled on the support and supplied with circumferentially extended blades coacting with the burrs, the working edges of adjacent blades being inclined in opposite directions transversely of the rotor, the said edges being supplied with teeth, the aforesaid construction of the working edges of the blades being such that a draw cut will be afforded, and being such that the material will be forced toward the center of the chute, thereby to avoid a clogging at the sides of the chute.

6. In a device of the class described, a support, a concave on the support and having inwardly projecting burrs, a rotor journaled on the support and supplied with circumferentially extended blades coacting with the burrs, the working edges of adjacent blades being inclined in opposite directions circumferentially of the rotor, the said edges being provided with teeth, and the edges of the teeth being sharpened, and a chute discharging on the rotor, the aforesaid construction of the working edges of the blades affording a draw cut and preventing a clogging of the material at the sides of the chute.

7. In a device of the class described, a support, a concave carried by the support, a rotor journaled on the support, a chute dis-

charging upon the rotor and the concave, the concave being provided with projecting annular burrs having openings which flare outwardly, the blades cooperating with the inner ends of the burrs, the edges of adjacent blades being oppositely inclined, and being provided with teeth, the said edges of the blades being sharpened, and the construction of the blades at their edges being such that a draw cut will be afforded, and, at the same time, the material will be carried toward the center of the chute, thereby to avoid a clogging at the sides of the chute.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOHN HENRY KERSHNER.