S. K. DENNIS & F. W. RICE.

FEED GRINDER.

APPLICATION FILED AUG. 3, 1907.

956,892. Patented May 3, 1910.

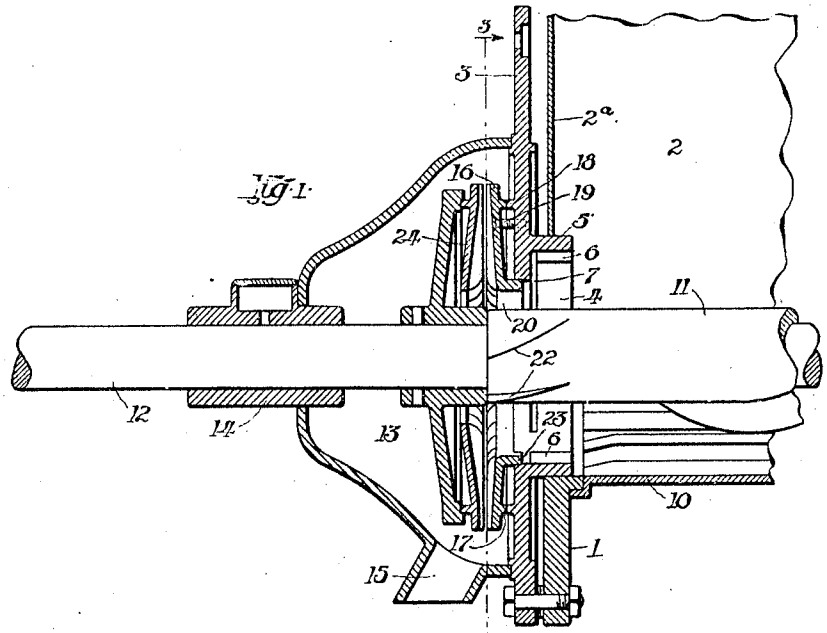

Fig. 1.

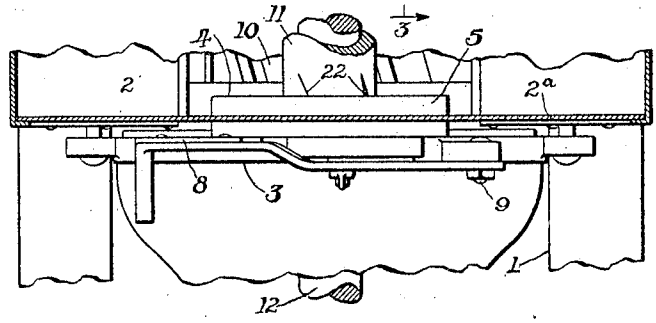

Fig. 2.

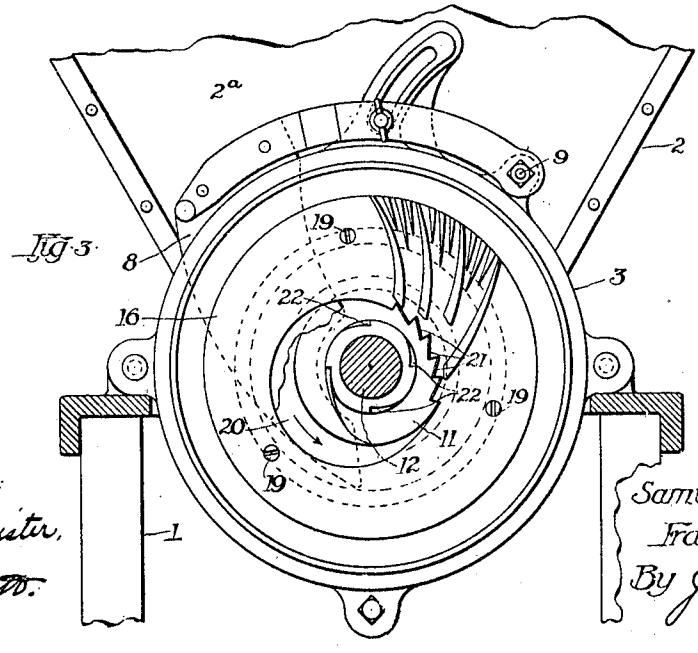

Fig. 3.

Witnesses:
F. W. Hoffmeister,
J. N. Daggett.

Inventors:
Samuel K. Dennis
and
Frank W. Rice.
By J. C. Warnes.
Attorney.

UNITED STATES PATENT OFFICE.

SAMUEL K. DENNIS AND FRANK W. RICE, OF CHICAGO, ILLINOIS, ASSIGNORS TO INTERNATIONAL HARVESTER COMPANY, A CORPORATION OF NEW JERSEY.

FEED-GRINDER.

956,892. Specification of Letters Patent. Patented May 3, 1910.

Application filed August 3, 1907. Serial No. 386,941.

To all whom it may concern:

Be it known that we, SAMUEL K. DENNIS and FRANK W. RICE, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Feed-Grinders, of which the following is a complete specification.

This invention relates to feed grinders of the vertical disk type, and is directly concerned with the grinding disks. The object in view is to increase the efficiency and capacity of feed grinders of the above type and to enable them to grind either shelled, ear-corn and other grains, or unhusked corn and chopped hay with equal facility. Feed grinders as at present constructed, so far as known to applicants, are not adapted to grind ear-corn with the husks on and similar fibrous matter without becoming clogged and choked, and hence much difficulty is experienced and time lost in clearing the grinder when such material is encountered.

The present invention consists essentially in providing an internally toothed eccentric feed opening in the stationary grinding disk surrounding the feed screw, these teeth coacting with teeth formed on the end of the feed screw. Such construction overcomes the above mentioned difficulty without impairing the efficiency or lessening the capacity of the machine.

The improved feature is illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section, taken through the grinding chamber adjacent to the end of the hopper and longitudinally of the feed grinder shaft. Fig. 2 is a fragmentary plan with the hopper shown in section; and Fig. 3 is a transverse section taken as indicated by the line 3—3 in Fig. 1, and shows, in elevation, the stationary grinding disk with its internally toothed eccentric feed opening surrounding the end of the feed screw.

In the drawings 1 designates a member of the grinder frame, and 2^a the wall of the hopper 2, only a fragment thereof being shown. To the frame member 1, and outside the hopper, is fixed the disk supporting casting 3, the said casting being provided with a flanged feed opening 4. The flange 5 surrounding the feed opening 4 is provided with the inwardly projecting teeth 6 and a slot 7, through which projects the cut-off 8, the cut-off being pivoted at 9 to the disk supporting casting 3. In the bottom of the hopper is located a concave 10 which coacts with the cob-breaker and feed screw 11 on the shaft 12, the latter being suitably journaled and extending through the hopper and grinding chamber 13. The grinding chamber 13 is secured to the cone supporting casting 3, the shaft bearing 14 serving to hold the same in position, and at the bottom of said chamber is formed the outlet 15.

The above described parts are known to be old in feed grinders, and hence the brief description given of these parts is thought to be sufficient; but for a more complete description reference is made to an application filed by us on the same type of machine February 6, 1907, Serial No. 355,990.

The novel feature of the present invention consists essentially in the peculiar construction of the stationary disk 16. This disk is provided with a flange 17, which abuts a flange 18 formed integral with the casting 3, and is held in position by means of the screws 19. By having comparatively limited bearing surfaces the two members will require very little grinding to bring them to proper position. This fixed disk 16 is provided with an eccentric feed opening 20 which surrounds the end of the feed screw 11, and that section of the feed opening which lies nearest the feed screw has formed therein the inwardly projecting teeth 21 which coöperate with the teeth 22 on the end of the feed screw 11. The fixed teeth 21 and the teeth 22 form coacting toothed surfaces, the teeth 22 in their movement advancing toward the teeth 21. The result of such arrangement will be a tearing and crushing effect upon the material operated upon greatly exceeding in effectiveness that obtained by concentrically arranged toothed surfaces. The teeth on the end of the feed screw and in the eccentric opening form in effect gradually approaching grinding surfaces which are very aggressive in their action, so aggressive that they not only engage and grind grain, but also readily engage and grind husks, pieces of stalks and chopped hay, thus effectually grinding all kinds of feed. The disk 16 is placed across the feed opening 4 in the casting 3, the flange 23 on said disk engaging said opening as shown in Fig. 1.

A disk 24 is fixed to the shaft 12 and co-

operates with the stationary disk 16. Obviously the teeth 21 on the disk could be made to extend a greater or less distance around the eccentric feed opening, but substantially the number shown was found to give very good results. A very effective disposition of the eccentric opening 20 and teeth 21 therein with respect to the end of the feed screw 11 is shown in Fig. 3. Since the larger part of the material operated upon will pass through the lower part of the feed opening 20, the teeth 22 on the end of the feed screw, which turns in the direction indicated by the arrow in Fig. 3, will engage any large or coarse part of same and it will be immediately crushed or torn between the said teeth on the roller and the teeth 21 on the disk.

What we claim as our invention, and desire to secure by Letters Patent, is:

1. In a feed grinder, in combination, a hopper, a grinding chamber, a feed shaft and screw thereon mounted to rotate in the bottom of said hopper, peripheral teeth formed on the end of said screw adjacent to the grinding chamber, a grinding disk fixed to said shaft, a coöperating stationary disk located within said grinding chamber and provided with an eccentric feed opening surrounding said feed screw, and a series of inwardly projecting teeth formed in said eccentric feed opening and adapted to cooperate with the teeth on the end of the feed screw, substantially as and for the purpose described.

2. In a feed grinder, in combination, a hopper, a grinding chamber, a feed shaft and screw thereon mounted to rotate in the bottom of said hopper, peripheral teeth formed on the end of said screw adjacent to the grinding chamber, a grinding disk fixed to said shaft, a coöperating stationary disk located within said grinding chamber and provided with an eccentric feed opening surrounding said feed screw, and a series of inwardly projecting teeth formed in said eccentric feed opening on the section thereof which lies nearest the feed screw and adapted to coöperate with the teeth on the end of the feed screw, substantially as and for the purpose specified.

3. In a feed grinder, in combination, a hopper, a grinding chamber, a feed shaft and screw thereon mounted to rotate in the bottom of said hopper, a dividing wall between said hopper and grinding chamber, said wall being provided with an internally toothed feed passageway surrounding the feed screw, a slide for regulating the extent of opening of said passageway, peripheral teeth formed on the end of said feed screw, a grinding disk fixed to said shaft, a cooperating stationary disk located within said grinding chamber and provided with an eccentric feed opening across said passageway and surrounding said feed screw, and a series of inwardly projecting teeth in the eccentric feed opening and adapted to cooperate with the teeth on the end of the feed screw, substantially as and for the purpose described.

SAMUEL K. DENNIS.
FRANK W. RICE.

Witnesses:
M. VAN DER VLIET,
CHARLES H. MANGOLD.