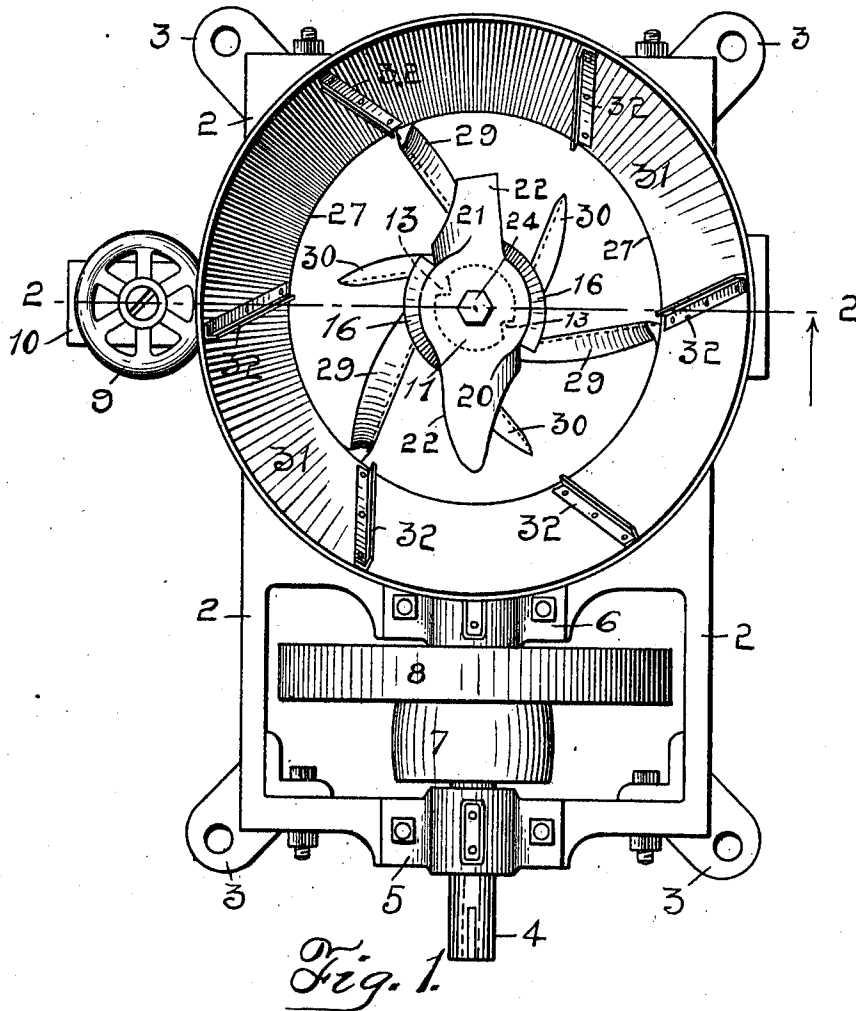


P. VAN HUFFEL.
FEED MILL.
APPLICATION FILED JUNE 7, 1909.

989,087.

Patented Apr. 11, 1911.

2 SHEETS—SHEET 1.



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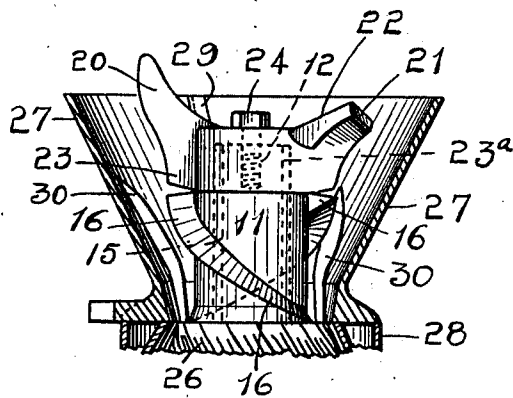


Fig. 2.



Fig. 3.

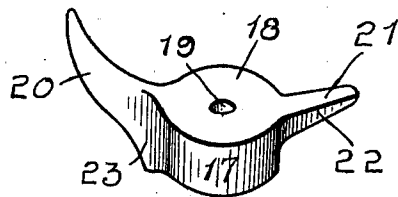


Fig. 5.

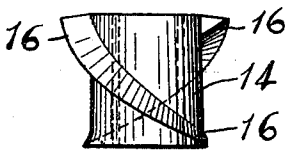


Fig. 4.

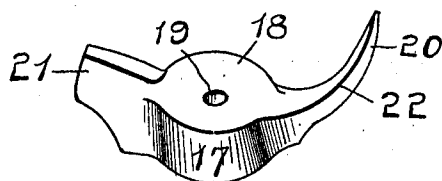


Fig. 6.

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UNITED STATES PATENT OFFICE.

PETER VAN HUFFEL, OF GALESBURG, ILLINOIS.

FEED-MILL.

989,087.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed June 7, 1909. Serial No. 500,640.

To all whom it may concern:

Be it known that I, PETER VAN HUFFEL, a citizen of the United States, and a resident of Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Feed-Mill, of which the following is a specification.

My invention relates to that general class of mills employed for grinding feed, and to that particular type thereof which are used for granulating or comminuting both the kernels and the cobs of ears of corn. It will be evident, however, as the invention is more fully disclosed and better understood, that the broad features of my invention may be embodied in mills of other types than that shown.

One of the primary objects of the invention is to so construct, arrange and dispose the reducing blades that a simpler and much more effective mill is produced than heretofore.

A further object is to provide means whereby the ears of corn are systematically directed into the reducing blades or breaking mechanism instead of falling thereinto in an indiscriminate manner. By providing this feature I obviate the heretofore very objectionable characteristics of throwing the ears from the hopper and of their wedging in the reduction chamber.

To provide a sectional reducer, the blades of which are integral with the head, and to furnish means whereby the spirals of the sections are retained in continuity, constitutes another object.

To so construct and arrange the co-acting parts of the breaking and reducing mechanism that a minimum of power is required to effect reduction, constitutes another object.

To so construct and arrange those co-acting parts of the mechanism which are above the grinding rings that they will effectually break up the cobs, shred the husks, and feed both to said rings simultaneously with the kernels—thereby preventing floating of said lighter parts, resulting in choking of the mill and unevenly mixed feed—constitutes another object.

That the mechanism constituting the means above recited be durable, strong and simple, is a prime requisite; to provide such mechanism for carrying out these ends forms still another object.

Other objects will be in part obvious and in part pointed out.

The invention accordingly consists in certain novel features hereinafter described and claimed.

Mechanism showing the preferred structural features, arrangement, connection and mutual relationship of the moving and other parts of my improvement, and the adjacent parts of the general machine in which they are incorporated, is illustrated in the accompanying drawings, in which:—

Figure 1 is a top plan; Fig. 2, a transverse vertical section, partly in elevation, in the line 2—2 in Fig. 1; Fig. 3, a plan of the member shown in elevation at Fig. 4; Fig. 4, an elevation of the lower section of the reducing-head; Fig. 5, a perspective of the upper member of said head; and Fig. 6, a similar view of the same member, seen from its other side.

The same numeral wherever herein used refers to the same part in the several figures of the drawings.

2 indicates a base having apertured feet 3 by means of which it may be fixed on a suitable support. A drive-shaft 4 is mounted in bearings 5, 6 in the frame, and carries a fixed pulley 7 and a fly-wheel 8.

9 and 10 illustrate means by which adjustments of the grinding mechanism (Fig. 2) may be effected.

The foregoing are parts of an ordinary feed-mill and require no further description herein.

11 indicates a vertical shaft adapted for revoluble actuation by gear (not shown) interposed between it and the shaft 4, and is provided at its upper end with a threaded axial bore 12 and on its opposite sides with ways or channels 13. A tubular or ring-section 14 of the reduction head is provided with internally disposed longitudinal ribs 15 which are adapted to slide and seat in the ways 13 to hold said shaft and section from revoluble movement with relation to each other. Spirally disposed reduction blades 16 are cast integral with the ring 14 and converge toward the lower end thereof. The cap-section of the reduction-head (Figs. 5 and 6) comprises a tubular portion 17, a cap or crown 18 provided with a central aperture 19, a longer stirring and reducing arm 20 and a shorter stirring and reducing arm 21, said arms being cast integral with

the other portions. The cap-section is prevented from too great downward movement on the shaft 11 by reason of its crown resting thereon. As shown best at Fig. 6, the point of the arm 20 is turned upwardly and its front edge doubly beveled to form a knife-edge 22. Its rear portion or heel 23 is pendent and curved, whereby, as the arm sweeps through the mass of corn in the reduction chamber (the motion being clockwise) it will act as a force-feed to drive the material downwardly in a crushed condition to the grinding rings. The lower face of the arm describes a curve—the initial portion of a spiral—as does also the lower face of the arm 21, which except in length corresponds to the blade 20. The cap-member is provided with internally disposed ribs 23^a which engage the channels 13 and are so disposed with relation to the arms 20 and 21 that the heel of each of said arms meets the initial portion, or what I may term the toe, of each of the blades 16 on the ring-member, whereby a practically continuous double spiral is formed, as shown best at Fig. 2. A cap-bolt 24 is passed through the aperture 19 in the cap-member and threaded into the axial bore 12 in the shaft to prevent the respective members of the head from being raised upwardly and off said shaft by the resistance of the corn being operated upon. The reduction chamber 27 is suitably supported above the grinding chamber 28, a fragmentary portion of which grinding chamber is shown at Fig. 2.

26 is one of the grinding rings within the chamber 28. The chamber 27 is of the usual tapered form and is provided on its inner wall with integral obliquely disposed and alternately arranged longer ribs 29 and shorter ribs 30, their faces which confront the ears of corn as they are swept thereagainst by the revolutions of the blades 20 and 21 being somewhat overhanging, as shown best by dotted lines at Fig. 1. In other words, the ribs 29 and 30 are undercut on that face of each thereof which is contrary to the direction of movement of the reduction blades. A hopper 31 surrounds the chamber 27 and is provided with ribs 32 fixed thereto, (or which may be integral therewith,) their order and arrangement being such that they correspond in obliquity and in position to and with the ribs in the chamber 27, whereby the ears of corn in the hopper, due to the agitation of the mass therein caused by the rotation of the arms 20 and 21 and by the reduction of the ears below, will arrange themselves with their ends pointing downwardly and in a superior manner to be caught and directed to the reduction chamber for operation thereon.

It will be evident that by constructing the feeding means substantially as hereinbefore described, there will be but little lia-

bility of breakage. However, should any unusual strain be placed on the reducing-arms (which are the parts most likely to be injured,) as by a stone being thrown into the hopper, and breakage should result, the expense of repair would be very small, as only one section thereof would need to be replaced. Moreover, the sectional head can be made more economically than if made in a single piece. The arms being cast integral with their respective head-sections, however, provides a stronger but at the same time more economically constructed device than is a head formed with inserted blades.

The operation: Upon the corn being thrown into the hopper, the revolutions of the arms 20 and 21 will tend to give it, as a mass, like movement. This however is prevented by the ribs 32 which will detain the mass and divert the segregated ears thereof, with their ends downwardly to the chamber 27, the ribs of which will co-act as hereinbefore described with the reduction-blades to convert the ears into fragments of a size suitable to be fed into the grinding mechanism. The longer arm 20 of the cap section of the reducing head will agitate or stir those ears of corn which lie near the wall of the hopper, while those lying near its central portion will be effectually agitated by the shorter arm 21, and especially by the end or point thereof. This feature (of a longer and a shorter arm) I have found in practice to be a decided advance in the art, inasmuch as the shorter arm keeps in constant agitation ears which heretofore have been merely swept around in the hopper, and I consider it as one of the most valuable and essential features of my improvement. Moreover, by giving the arms 20 and 21 the novel and peculiar form hereinbefore described and as shown in the drawings, that is, with their points upturned and their heels pendent, and arranging them to form a spiral, I provide means which will not only stir the ears of corn as do horizontally disposed arms or sweeps, but which further keep in agitation those ears which lie in planes above and below those agitated by such horizontally disposed arms, the spiral arrangement effectually forcing the ears downwardly to the reducing blades on the ring section and thence to the grinding burs.

Having thus set forth the construction and operation, and having described the purposes and advantages of my invention, I claim as new and desire to secure by Letters Patent the following, to-wit:—

1. In a mill, in combination with a hopper and a reducing-chamber provided with internally disposed ribs, a revoluble shaft, and a reduction-head mounted thereon and actuable thereby, said head comprising a ring-section provided with spirally arranged

blades and a cap-section provided with two oppositely disposed and spirally arranged cutting arms, said arms being of uneven lengths, and each of them having a downwardly directed cutting edge, a pendent heel, and an upturned point.

2. A feed-mill in which are combined a hopper provided with ribs on its inner wall, a reducing-chamber disposed therebeneath, said chamber provided with ribs in line with and acting as continuations of those above recited, a shaft disposed vertically and centrally of said hopper and chamber, a ring-section provided with spirally arranged reducing-blades, mounted on said shaft and within said chamber, and a cap-section

mounted on said shaft and surmounting said ring-section, said cap-section provided with a longer and a shorter agitating arm, the points of said arms being upturned and the heels thereof pendent and curved spirally, said heels adapted and arranged to meet and coincide with the upper ends of the spirally arranged blades of the ring-section, whereby a continuous spiral is provided.

In witness whereof I hereunto set my hand this 3rd day of June, 1909.

PETER VAN HUFFEL.

Witnesses:

MARY MOORE,
H. M. RICHARDS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
