

(No Model.)

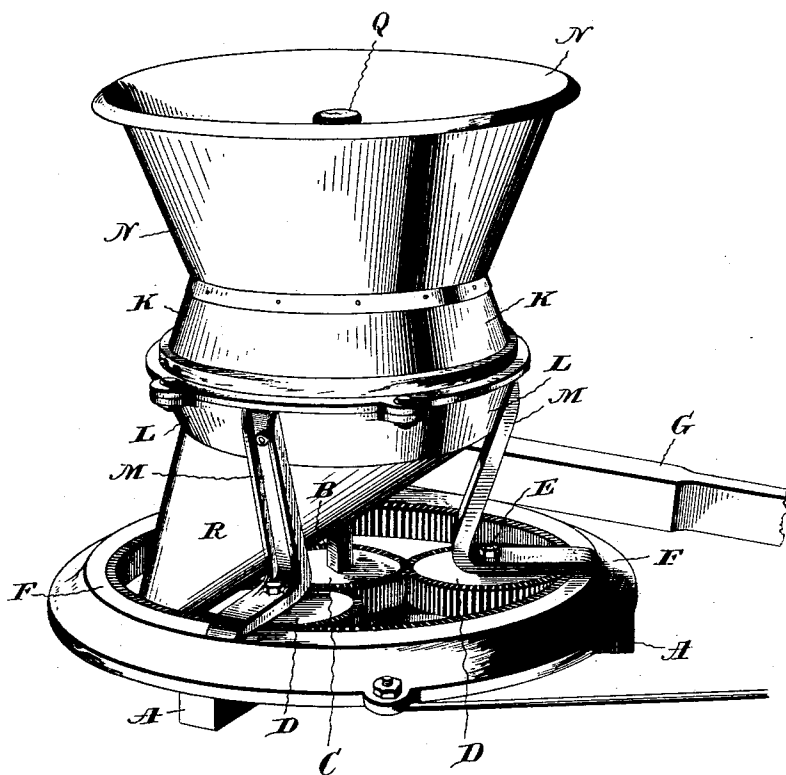
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T. L. PHILLIPS.  
FEED GRINDING MILL.

No. 587,555.

Patented Aug. 3, 1897.

Fig. 1.



Witnesses:

James Hutchinson.  
Henry C. Hazard.

Inventor.

Thomas L. Phillips  
by *Prindle & Russell*  
his Attorneys

(No Model.)

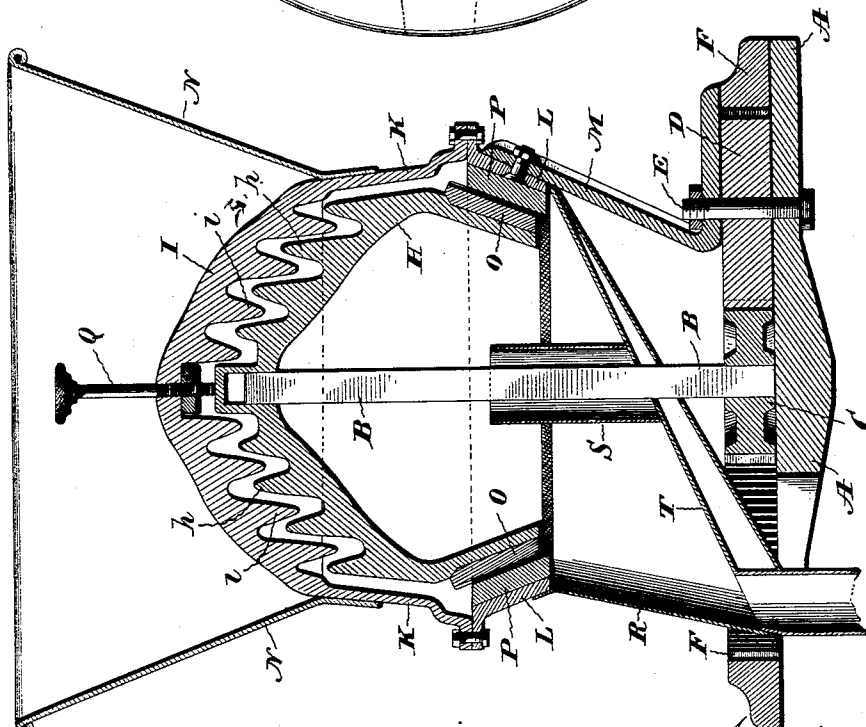
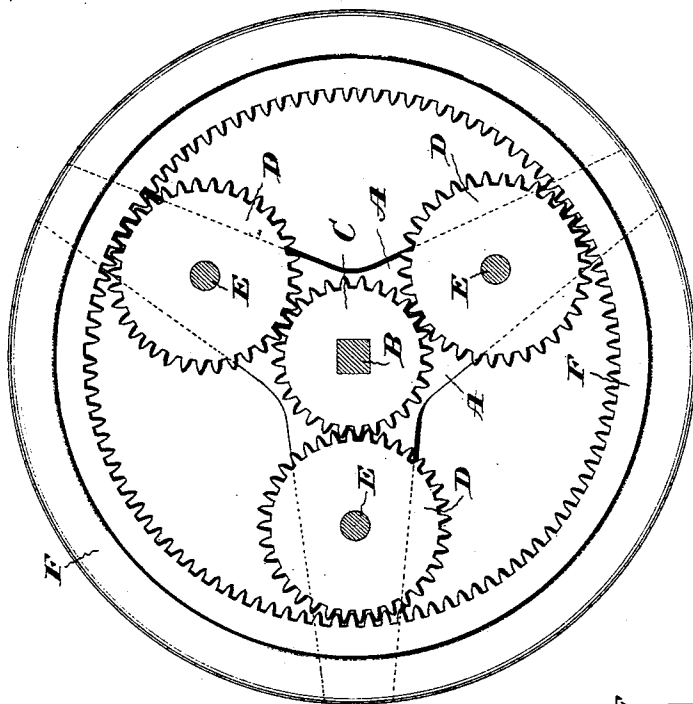
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T. L. PHILLIPS.  
FEED GRINDING MILL.

No. 587,555.

Patented Aug. 3, 1897.

Fig. 3.



Witnesses:  
Jas. Hutchinson.  
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Fig. 2.

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his Attorney

(No Model.)

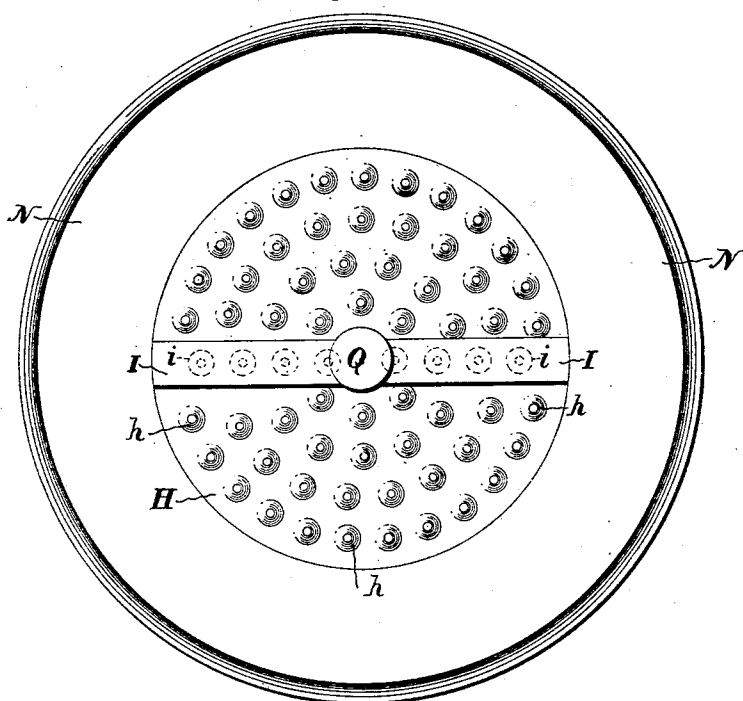
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T. L. PHILLIPS.  
FEED GRINDING MILL.

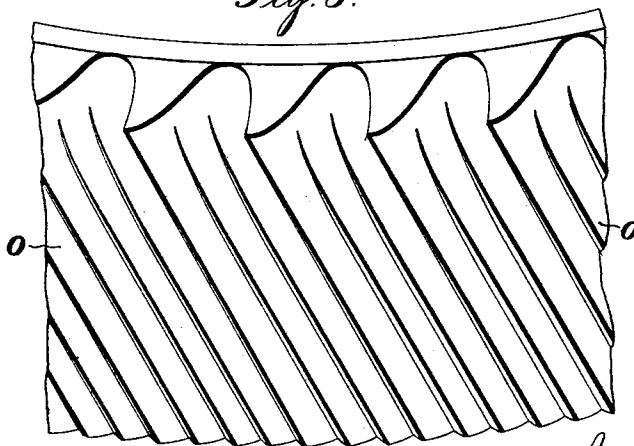
No. 587,555.

Patented Aug. 3, 1897.

*Fig. 4.*



*Fig. 5.*



Witnesses:  
Frank P. Prendle.  
Henry C. Hazard.

Inventor  
Thomas L. Phillips  
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his Attorneys.

# UNITED STATES PATENT OFFICE.

THOMAS L. PHILLIPS, OF AURORA, ILLINOIS, ASSIGNOR TO THE CHALLENGE  
WIND MILL AND FEED MILL COMPANY, OF BATAVIA, ILLINOIS.

## FEED-GRINDING MILL.

SPECIFICATION forming part of Letters Patent No. 587,555, dated August 3, 1897.

Application filed May 5, 1896. Serial No. 590,275. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS L. PHILLIPS, of Aurora, in the county of Kane, and in the State of Illinois, have invented certain new and useful Improvements in Feed-Grinding Mills; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my mill; Fig. 2, a vertical section through the same; Fig. 3, a longitudinal section. Fig. 4 is a detail top plan view of the cob-breaker, and Fig. 5 a detail view of a portion of one of the grinding-rings to show the dress thereof.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide a cheaply-constructed, efficient, durable, and easily-operated corn or feed grinding mill; and to this end said invention consists in the grinding-mill having the construction and combination of parts substantially as herein-after described.

In the carrying of my invention into practice I mount the parts of my mill upon a suitable base A, which preferably has the three-armed form shown. Supported by said base at its center is a vertical shaft B, that is angular in cross-section. Mounted upon the shaft just above the base is a gear C, that is in mesh with three gears D and D, placed, respectively, upon the three arms of the base and journaled each upon a stud or bolt E, that projects above the upper side of an arm. Said gears D and D mesh with and receive power from an internally-gearred ring F, that is provided with suitable means, as a sweep G, by which it may be revolved to drive the shaft B.

Mounted upon the upper end of the shaft is a conical drum H, whose upper side is provided with numerous teeth *h* to coöperate with like teeth *i*, that project downward from a diametrically-extending bar I, said parts constituting a cob-breaker. The bar I is attached to the upper edge of a substantially cylindrical shell K, which is bolted at its bottom to a circular or ring-form casting L. The latter is attached to and supported by several arms or brackets M and M, that respectively

rest upon the gears D and D and the ring F and are held in place by the gear bolts or studs E and E. A hopper N, of usual form, is secured to the top of the shell K, as shown. The portions of the brackets M and M that rest upon the ring F serve to retain the latter in position against movement upward.

The two grinding-rings O and P, the former being the movable and the latter the stationary one, are mounted, respectively, upon the drum H and the casing L. The grinding-faces of said rings incline inward and downward, and the movable ring being the upper one the result is that the pressure during grinding is upward, the effect of which is to avoid contact of the grinding-faces with each other with consequent wear.

That the tendency of the upper ring is upward during grinding will be apparent when it is considered that the material being ground, especially when as it first enters between the rings it is large, offers resistance to the rotation of the ring, and such resistance must necessarily cause an upward tendency of the ring because of the downward and inward inclination of its periphery.

Another advantage of the downward and inward inclination of the grinding-faces is that as the grain being ground gravitates downward to the point of outlet it is ground much finer than is the case where the larger end of the rings is downward.

The grinding-rings are preferably made quite shallow and their faces inclined at an angle of about seventy degrees from the horizontal, as after experimenting I have found that such a construction produces the best results.

The space between the grinding-rings is adjustable by moving the revolving ring O vertically, and this is best done by providing a screw Q, that is tapped through a nut at the transverse center of the bar I to engage the top of the drum H at its center to limit the upward movement of the drum.

In Fig. 5 is illustrated a portion of the movable ring O to show the manner of dressing the grinding-faces of the rings, the dress of course being coarsest at the top and becoming finer toward the bottom of the rings. I do not, however, limit myself to this or any

particular manner of dressing the grinding-surfaces.

The ground product passes from between the grinding-rings into a cone-shaped delivery-spout R, whose discharge-mouth is eccentrically located, and as the shaft passes through the wall of said spout a portion thereof to a point above the level of the lower edge of the grinding-rings is inclosed by a tube S, that rests at its lower end and is attached to a false bottom or portion T, arranged in an inclined position within the spout. Said tube prevents the ground material from passing through the opening provided for the shaft.

The use of the angular shaft is of material advantage compared with a round one in that it permits of cheaper construction, and as the various parts mounted thereon are fitted somewhat loosely any irregularities in position with reference to their cooperating parts which would result in binding or unusual wear will be avoided by the shaft parts accommodating themselves to the others.

Having thus described my invention, what I claim is—

1. In a grinding-mill, the combination of the base, a grinding-ring, a support fixedly holding the same, attached to the base, a second grinding-ring, and gearing for revolving the latter, comprising in part a toothed ring, which rests on said base, the support for the fixed grinding - ring extending over said toothed ring, substantially as and for the purpose specified.

2. In a grinding-mill, the combination of the base, a grinding-ring, several brackets to which the latter is attached, a second grinding-ring, gear-wheels to impart movement thereto, mounted on said base, and an internally - toothed ring for actuating said wheels, also resting on said base, said brackets resting on said wheels and toothed ring, substantially as and for the purpose set forth.

3. In a grinding-mill, the combination of the base, the shaft, supported by the same carrying a grinding-ring, a gear on said shaft, above the base, a series of gears, mounted each on a bolt or stud on the base, meshing with the shaft-gear, means for driving said series of gears, brackets above the latter secured to their pivot-bolts, and a grinding-ring attached to said brackets, substantially as and for the purpose shown.

4. In a grinding-mill, the combination of the grinding-rings having downwardly and inwardly inclined grinding-faces, a shaft for revolving the upper one of said rings, relatively to which it may move in an axial direction, and a screw passing through a suitable support and abutting against a part of said ring, to restrain its upward movement, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 25th day of April, 1896.

THOMAS L. PHILLIPS.

Witnesses:

W. J. TYERS,  
E. T. PRINDLE.