(No Model.)

E. H. & C. MORGAN.

GRINDING MILL.

No. 281,911. Patented July 24, 1883.

Fig. 1.

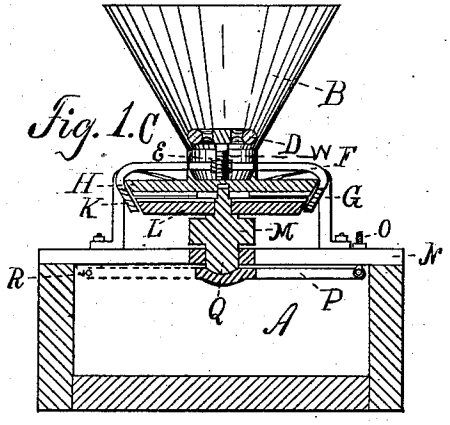


Fig. 4.

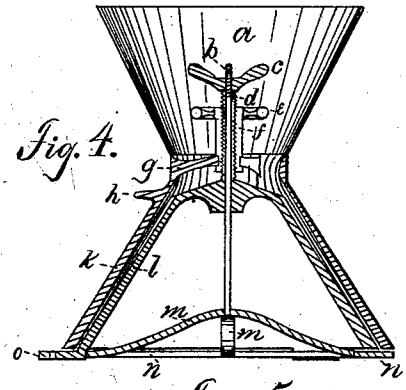


Fig. 5.

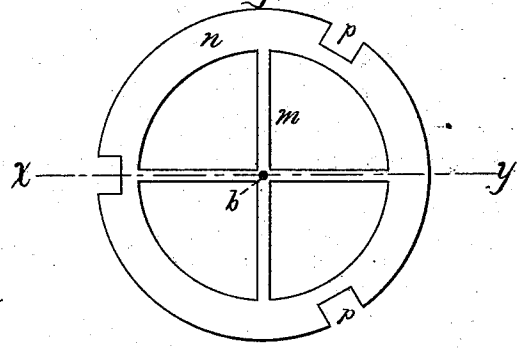


Fig. 2.

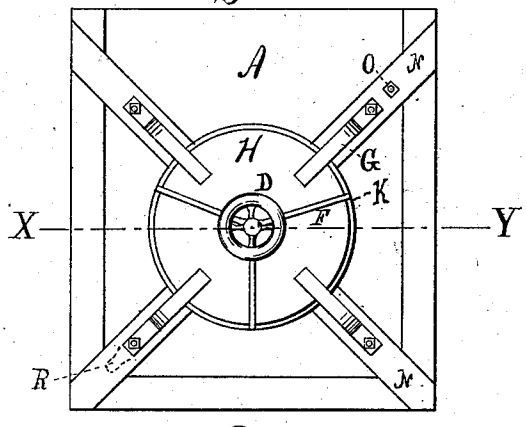


Fig. 3.

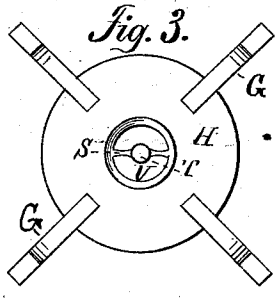
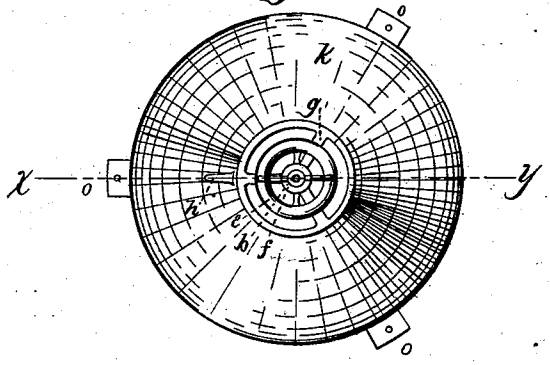


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDGAR H. MORGAN AND CHARLES MORGAN, OF FREEPORT, ILLINOIS.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 281,911, dated July 24, 1883.

Application filed October 30, 1882. (No model.)

To all whom it may concern:

Be it known that we, EDGAR H. MORGAN and CHARLES MORGAN, residents of Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Grinding-Mills; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

Our invention is an improved means for regulating the fineness to which grain is ground in a grinding-mill of any ordinary construction, and is described in the following specification and shown in the accompanying drawings, in which—

Figure 1 is a vertical section of a horizontal burr-mill with the regulating device attached, the plane of section passing through the line *x y*, Fig. 2; Fig. 2, a plan of same with hopper removed; Fig. 3, a plan of the upper plate of said mill; Fig. 4, a vertical section of a cone-mill having regulating device attached, the plane of section passing through line *x y*, Figs. 5 and 6; Fig. 5, a plan of the regulating-plate, and Fig. 6 a plan of the entire mill.

The gist of our invention is the regulation of the fineness of the meal by regulating the rapidity of its flow from the grinding-burrs, the rate of such flow being governed by means placed at the outlet from the burrs, and not in any way dependent upon any device for feeding the grain to the burrs. As applied to a mill whose grinding-faces are on the contiguous surfaces of two or more flat burrs, the device is a ring surrounding the burrs and so constructed that it may be readily brought nearer to or farther from the opening at the peripheries of the burrs. In a cone-mill the form of the device is a flat ring placed immediately below the opening between the grinding-faces of the cones, and provided with suitable means for raising or lowering it. In either case it forms a means of resistance to the outward flow of the meal from the grinding surface, and is susceptible of such adjustment as to increase or decrease such resistance at will to the extent of entirely stopping the flow, on the one hand, or of leaving it wholly unimpeded on the other.

In Figs. 1, 2, and 3 is shown a flat-burr mill, in which N N are four radial arms united at a common center and resting at their outer ends on a box, A. On the arms N, at equal distances from the center, are bolted four vertical standards, G, to the upper ends of which is rigidly attached the circular top plate, H, of the mill, provided with grinding-teeth on its lower face. At the center of the top plate, H, is a circular opening for the admission of grain, and about this opening is a vertical neck, on which rests an ordinary hopper, B. Across the central opening of the plate extends a web, S, having a circular enlargement, T, at its center, and this enlarged portion is provided with a socket extending upward partly through it from its lower face, and forming a bearing for the upper end of the vertical shaft Q, to which is rigidly attached the lower grinding-burr, L, of the mill. The lower portion of the shaft Q is pivoted in a bearing in the center of the arms N, and rests on an adjusting-bar, P, which may be readily raised and lowered by means of a bolt, O. Between the upper and lower bearings of the shaft Q is rigidly attached to it a pulley, M, by means of which it may be rotated.

The burrs H L are beveled at the edges, so as to form an inverted frustum of a cone, and about them both is hung a conical ring, K, provided with three arms, F, which meet at a common center, forming a nut, E, which is provided with an internal screw-thread. A corresponding screw, W, provided with a hand-wheel, D, at the upper end, passes through the nut, and rests upon the enlarged central portion, T, of the web S. By means of this screw the ring K may be readily raised or lowered, and it is evident that bringing the ring higher will also bring it closer to the periphery of the burrs and more effectually close the opening between them, while lowering it will have a contrary effect.

In Figs. 4, 5, and 6 is shown a cone-mill, in which *l* is the inner cone, provided with three projecting ears, *o*, for attaching it to a box or other base. Above and outside the inner cone rests the outer cone, *k*, provided with an outer lug, *h*, for attaching sweeps, a series of radial arms, *g*, meeting at a common center above the

inner cone, a vertical neck above and outside of the radial arms *g*, and a hopper, *a*, of ordinary form, attached to the neck. The contiguous faces of the cones are provided with grinding-teeth. A hollow screw, *d*, is rigidly attached to the vertex of the inner cone, and a nut, *f*, keyed to the arms *g* at their common center and provided with a hand-wheel, *e*, at the top, plays up and down upon the screw *d*, and serves as a means of raising and lowering the outer cone. Immediately below the opening, between the cones *k l*, is a ring, *n*, provided with a series of converging arms or spokes, *m*, at the center of whose intersection is attached a vertical rod, *b*, which extends upward through and above the hollow screw *d* and terminates at the upper end in a screw. A wing-nut, *c*, raises and lowers the rod *b*, and with it the ring *n*. The ring is reduced by slots *p* at three points, where it passes the ears *o* of the inner cone.

The action of the regulating-ring in both mills is evident. The mills being put in operation by the application of power to the pulley *m*, in one case, or to sweeps attached to the outer cone in the other, the corn fed in at the hopper is ground between the grinding-faces, and passes out at their periphery. If the regulating-ring be brought in actual contact with the periphery of the grinding-surfaces, the outlet from the space between them will be completely closed, and the meal will be retained until it is ground to powder. On the other hand, if the regulating-ring be so far withdrawn as to permit an uninterrupted flow of the meal from the burrs, it will pass out without being in any way affected by the ring, its fineness depending solely on the adjustment of the grinding-burrs themselves.

In practice we think it will not be necessary to provide any means for the adjustment of the burrs, as, we believe, it will be sufficient to construct the mill for grinding the grain into very coarse meal, leaving the regulation of its fineness entirely to the regulating-ring; but we do not limit our invention to its use in either way, neither do we intend to limit it to its use in combination with the particular adjusting devices shown and described, as it is evident that numberless forms may be devised to accomplish the same result; but,

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a grinding-mill, the combination of two contiguous grinding-surfaces, suitable means for operating the same, a ring adapted to retard the flow of meal from the space between said grinding-surfaces, and suitable means for adjusting said regulating-ring and varying the degree of such retardation.

2. In a cone grinding-mill, the combination of the grinding-cones, a regulating-ring hung immediately below the space between said cones and adapted to impede the flow of the meal from said space, and suitable means for raising and lowering said ring.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

EDGAR H. MORGAN.
CHARLES MORGAN.

Witnesses:
R. H. WILES,
J. A. SHEETZ.