No. 777,410. PATENTED DEC. 13, 1904.

L. E. GAISSER.

GRINDING MILL.

APPLICATION FILED MAY 19, 1902.

NO MODEL.

Fig. 1.

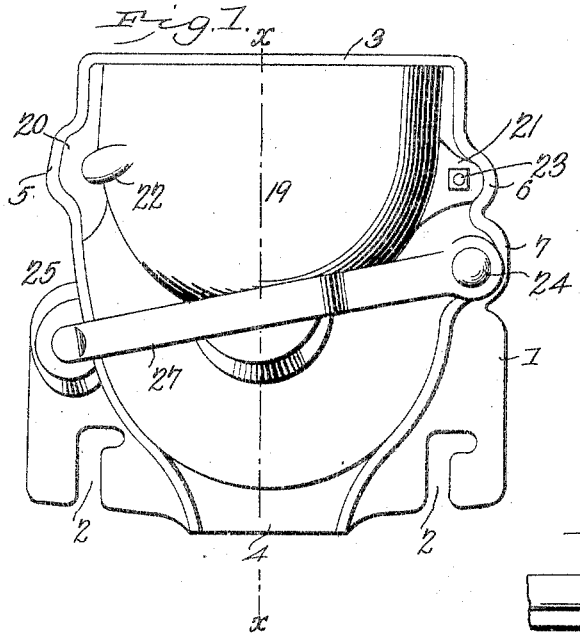


Fig. 3.

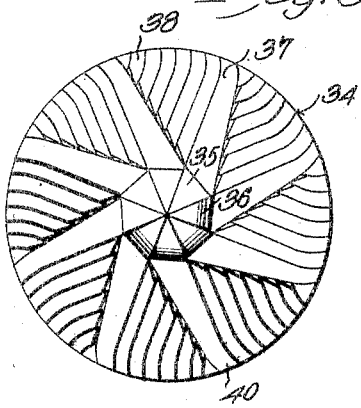


Fig. 4.

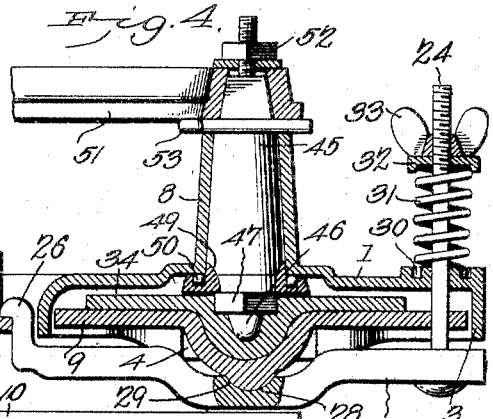
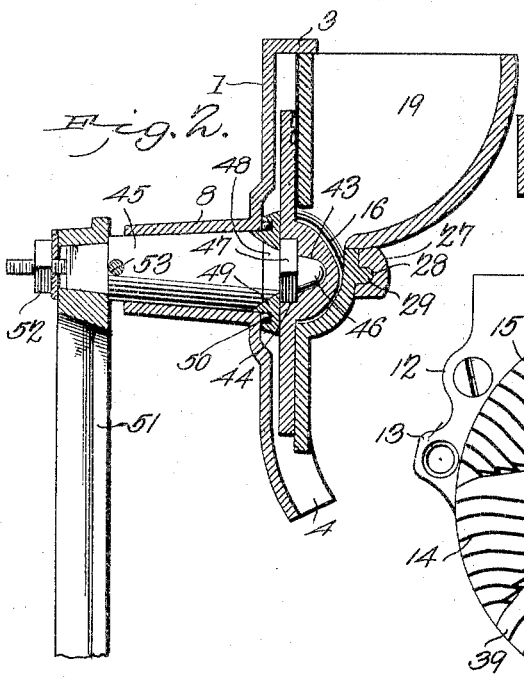


Fig. 2.



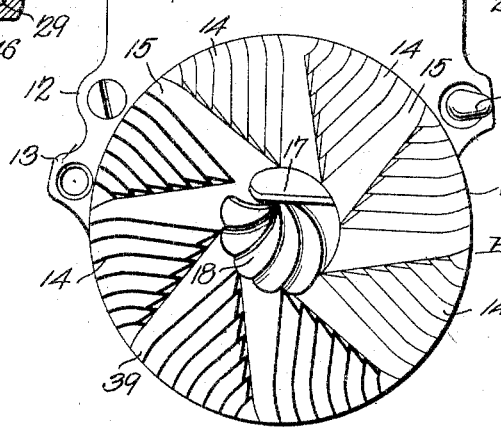


Fig. 5.

Witnesses
E. C. Stewart
Wm. Bagger

L. E. Gaisser, Inventor.
by Church & Co
Attorneys

No. 777,410. Patented December 13, 1904.

UNITED STATES PATENT OFFICE.

LOUIS ENGLEBERT GAISSER, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO ALICE R. GAISSER, OF LOUISVILLE, KENTUCKY.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 777,410, dated December 13, 1904.

Application filed May 19, 1902. Serial No. 108,029. (No model.)

To all whom it may concern:

Be it known that I, LOUIS ENGLEBERT GAISSER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented a new and useful Grinding-Mill, of which the following is a specification.

This invention relates to grinding-mills; and it has for its object to produce a device of this class which shall possess superior advantages in point of simplicity, durability, ease of manipulation, and general efficiency.

A further object of my invention is to construct a mill in which the several constituent parts shall be few in number and so constructed and related to each other as to admit of repairs being easily made in the event of injury or breakage of any of the parts.

A further object of my invention is to construct a mill in which the stationary and rotary grinding members shall be centered together, so as to coöperate with perfect accuracy without the presence of a shaft or operating member extending through either or both of said grinding members.

With these and other ends in view my invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of a grinding-mill constructed in accordance with the principles of my invention. Fig. 2 is a vertical section taken on the line $x\ x$ in Fig. 1. Fig. 3 is a face view of the runner-bur detached. Fig. 4 is a sectional view taken on the line $y\ y$ in Fig. 1. Fig. 5 is a face view of the plate which carries or constitutes the stationary member of the grinding part of the device.

Corresponding parts in the several figures are indicated by similar numerals of reference.

1 designates the base-plate of my improved grinding-mill, which is provided with L-shaped recesses or apertures 2 2 near the lower edge thereof, whereby it may be supported in position for operation by means of bolts. (Not shown.) The base-plate is provided with a flange 3, surrounding the upper portion thereof or projecting forwardly from the edge of said plate, the lower ends of said flange being made to extend forwardly from the face of the plate, as will be readily seen in Fig. 1 of the drawings. Said lower ends of the flange 3 are made converging, so as to form what constitutes a discharge-chute 4, the lower part of the base-plate being bent in a rearward direction, as clearly seen in Fig. 2, thus causing the discharge from the mill to be delivered in a rearward direction, the operating-handle to be hereinafter described being located at what I shall term the "front" part of the mill.

The conformation of the base-plate is such that the flange 3 shall be bulged outwardly at opposite sides, so as to form recesses 5 and 6. An additional recess 7 is formed below the recess 6, as will be seen in Fig. 1. The slots or apertures 2 2 are formed in parts of the base-plate lying outside the flange 3, so that the latter will not interfere with the placing of the device in operative position.

The base-plate is provided with a forwardly-extending tapering sleeve 8, which forms a bearing for the operating-shaft, to which reference will hereinafter be made.

The stationary grinding member of the device consists of a plate having a circular furrowed face 9 and an upwardly and laterally extending portion 10, which is formed with projections 11, 12, and 13, adapted to engage, respectively, the recesses 5, 6, and 7, formed in the flange of the base-plate. The upper edge of the part 10 is fitted to bear against the under side of the top portion of the flange 3, so that said plate, which constitutes the stationary member, may be said to be fitted within the said flange, especially as the lower circular portion of said plate practically fits between the lower converging ends of said flange, as will be seen in Fig. 1, with the exception of the parts of said flange which are extended downwardly to form the discharge-chute.

The circular face 9 of the stationary grinding member has a grinding-surface formed by the grinding-furrows 14 and the feeder-furrows 15. Said circular portion is also provided with a central bulging portion 16, the concave side of which has a series of scalloped

feeder-furrows 18, conforming to and merging into the feeder-furrows 15. Said bulging portion is also provided in its upper side with an opening 17.

19 designates the feed-hopper, which is provided with laterally-extending lugs 20 and 21, the former of which is provided with a hooked spur 22, engaging a perforation in the lug 11 of the stationary grinding member. The lug 21 is provided with a perforation for a bolt 23, engaging an aperture in the lug 12 of the stationary grinding member, with which the said hopper is thereby detachably connected. The lower end of the feed-hopper engages the opening 17 of the stationary grinding member, through which the material to be ground is thus fed between the grinding-surfaces. It will be observed that the lugs 20 and 21 of the hopper are made to fit the recesses 5 and 6 of the flange 3, thereby insuring stability of the connection between the parts.

The part 13 of the stationary grinding member, which lies within the recess 7 of the flange 3, is perforated for the reception of a bolt 24, which also extends through the perforation in the base-plate. The latter is provided at its opposite side with a cap portion 25, having a perforation for the reception of a hook 26, formed at one end of a yoke or lever 27, the opposite end of which has a perforation through which the bolt 24 also extends. The central or yoke-shaped part of this lever has a recess 28, engaging a flange 29, formed upon the convex side of the bulging portion 16 of the stationary grinding member. The front side of the base-plate is provided with a seat 30, surrounding the aperture through which the bolt 24 extends, for the reception of one end of a coiled spring 31, the opposite end of which bears against a washer 32, which is held in place by a thumb-nut 33. It will thus be seen that the force of the spring 31 is expended to force the part which has been designated as the "stationary grinding member" in a forward direction, while at the same time the said grinding member is capable of flexing or yielding rearwardly, as will be readily understood, the degree of pressure being regulated by means of the thumb-nut 33.

34 designates the runner-bur or rotary grinding member, which is circular in shape and which is provided with a central bulging portion 35, the convex side of which is provided with feeder-furrows 36, while the face of the disk surrounding the convex portion is provided with feeder-furrows 37, merging with the furrows 36 and with grinding-furrows 38, the furrows 36, 37, and 38 of the runner-bur obviously coacting with the furrows 18, 15, and 14 of the stationary grinding member to effect the reduction of the material passing between the grinding members. The outer ends of the furrows of both burs are curved, as shown at 39 and 40, respectively, to increase the length of the furrows and also to increase the grinding power at the finish or discharge ends of the furrows, causing said furrows to cross each other at a more acute angle and therefore grind finer than at the intermediate points on the burs. The primary or coarse grinding is obviously effected between the coarse furrows at the bulging central portions of the burs, which coact to effect such reduction and to feed the material that is being operated upon radially to gradually effect the reduction to the desired degree of fineness, which may be regulated by means of the thumb-screw 33.

The location of the runner-bur is obviously in front of and in engagement with the stationary grinding member, the central concavity of which is engaged by the central convexity of said runner-bur, which is thereby most accurately centered, displacement of the burs with relation to each other being practically impossible. It will also be specially observed that the said burs are centered without the necessity of any shaft passing through either or both of said burs. The advantage of this is twofold—first, the avoidance of the obstruction usually offered by the presence of a shaft; second, the impossibility of leakage. To these might be added a third advantage resulting from the impossibility of lubricating material finding its way between the burs, where its presence is not only not desired, but very objectionable.

The front side of the central bulging portion of the runner-bur has a central socket 43 and a non-circular recess 44.

45 is a tapering shaft, which is fitted in the tapering sleeve 8 and which is provided at its inner or rear end with a spindle 46, engaging the socket 43 in the runner-bur, in which it is thereby centered, and it is furthermore provided with a non-circular collar 47, which may be formed of a nut engaging the screw-threaded end of the shaft and also engaging the recess 44 of the runner-bur, which is thus connected to revolve with said shaft. The shaft 45 is provided in front of the collar 47 with an annular flange or collar 48, held in position by the nut 47 and having a groove 49, which constitutes a ball-race in which antifriction-balls 50 are placed. The outer or front end of the shaft 45 is provided with operating means, here shown as a crank or handle 51, which may be held in position by a nut 52, engaging a screw-threaded portion of the shaft, the front end of which is squared for the reception of said crank. A transverse pin 53, extending through the shaft in front of the sleeve 8, prevents the accidental dislocation of said shaft when the machine is dismembered, thus retaining the antifriction-balls in position. These antifriction-balls and the parts relating thereto may, however, be omitted from the device, if preferred.

The operation and advantages of my invention will be readily understood from the fore-

going description, taken in connection with the drawings hereto annexed. The general construction is extremely simple and inexpensive, and my improved mill is well adapted for the reduction of the various grains to fine or coarse meal.

I desire it to be understood that while I have described a preferred construction of my invention I do not limit myself as regards the structural details thereof, but reserve the right to any changes and modifications which may be resorted to without departing from the spirit of my invention.

Having thus described my invention, what I claim is—

1. In a grinding-mill, a base-plate provided with means for attachment to a support, with a forwardly-bent lower portion, with laterally-extending protuberances, two at one side and one at the opposite side thereof, and with a flange extending forwardly from the upper portion and the sides of said plate including the protuberances at the sides and thence converging downwardly at the sides of the forwardly-bent portion, coöperating with the latter to form a discharge-chute.

2. In a grinding-mill, a base-plate having means for attachment to a support and provided with a rearwardly-extending sleeve, laterally-extending protuberances, two at one side and one at the opposite side, a flange projecting forwardly from the upper edge and the sides of the plate including the protuberances, a shaft journaled in the sleeve, a grinding member connected detachably with said shaft and having a forwardly-extending convexity, a stationary grinding member having protuberances engaging the flanged protuberances of the base-plate and having an upward extension bearing against the forwardly-extending flange portion at the upper edge of the base-plate, said stationary grinding member having a concavity corresponding with the convexity of the rotary grinding member and an eccentric slot in the upper portion of said convexity, a hopper connected with said stationary grinding member and discharging through the eccentric slot therein, and means for supporting the stationary grinding member flexibly against the face of the rotary grinding member.

3. In a grinding-mill, the combination of a base-plate having a sleeve forming a bearing, a shaft mounted in said bearing and carrying a centrally-imperforate runner-bur provided on its furrowed side with a central furrowed convexity, an axially-imperforate stationary grinding member supported yieldably against the face of the runner-bur and having a central bulging portion the concave seat of which engages the convex runner-bur, said bulging portion being provided with a slot in its upper side, and a hopper secured to the outer side of the said stationary grinding member and discharging into the slot in the bulging portion of the latter.

4. In a grinding-mill, the combination of a base-plate having a rearwardly-extending contracted sleeve, a frustum-shaped shaft journaled in said sleeve, a revoluble grinding member connected detachably with said shaft, an annular groove upon the latter coöperating with the face of the base-plate adjacent to the central opening of the sleeve to form a ball-race, antifriction-balls in said groove, a pin extending transversely through the shaft at the outer end of the sleeve, and a hopper-bearing stationary grinding member connected with the base in flexible engagement with the face of the revoluble grinding member.

5. In a grinding-mill, the combination with a stationary grinding member having a central cavity provided with scalloped feeder-furrows, a disk portion having feeder-furrows extending from said cavity and grinding-furrows extending therefrom, of a disk-shaped runner-bur having a central convexity adapted to conform to said cavity, said convexity having radial furrows communicating with feeder-furrows in its disk portion and grinding-furrows extending therefrom, the outer ends of the furrows in both grinding-disks being curved, substantially as and for the purpose described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

LOUIS ENGLEBERT GAISSER.

Witnesses:
JOHN L. BRINLY,
GEO. GUTIG.