(No Model.) 2 Sheets—Sheet 1.

T. C. CADWGAN.

CRUSHING AND GRINDING MILL.

No. 457,146. Patented Aug. 4, 1891.

Fig. 1

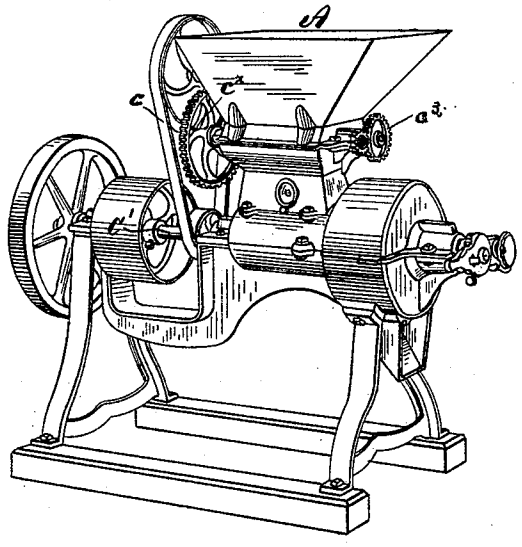
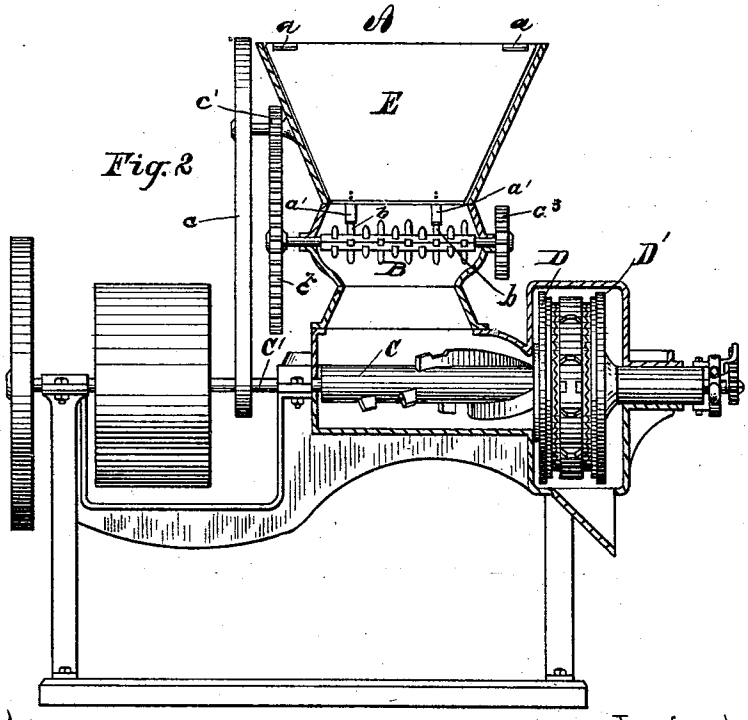


Fig. 2



Witnesses
Chas. F. Brewin
W. S. Grove

Inventor
Thomas C. Cadwgan
By Paul A. Staley
Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3

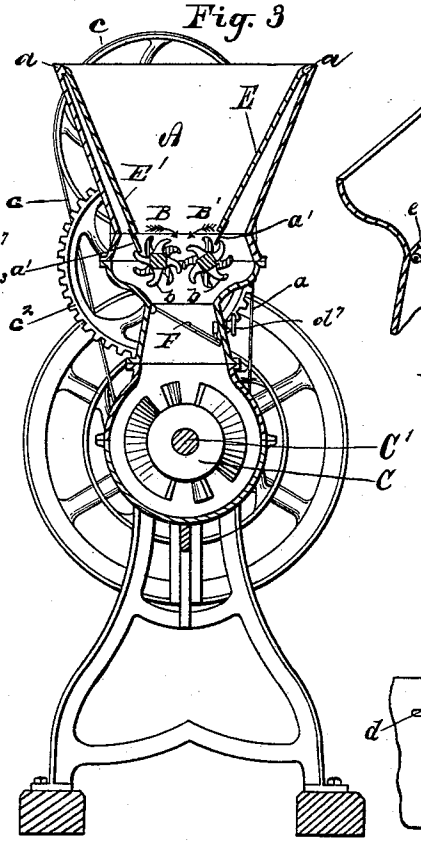


Fig. 5

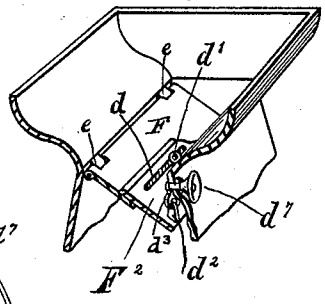


Fig. 6

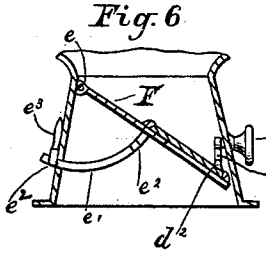


Fig. 9

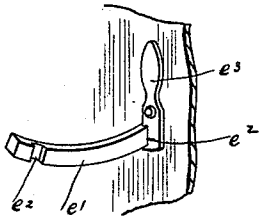


Fig. 7

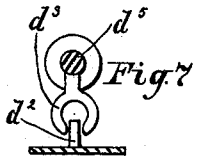


Fig. 8

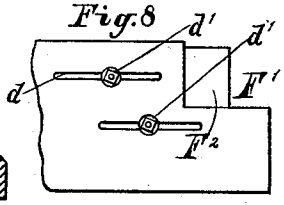
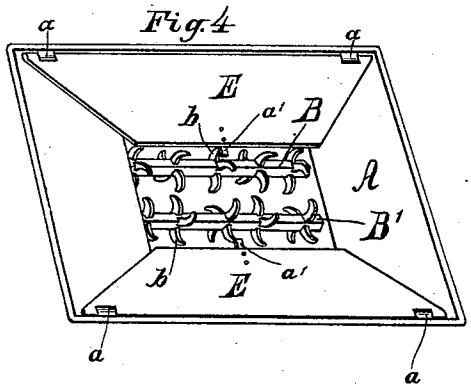


Fig. 4



Witnesses

Chas. D. Gresnin

W. S. Grove

Inventor

Thomas C. Cadwgan

By Paul A. Staats

Atty

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

THOMAS C. CADWGAN, OF SPRINGFIELD, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE O. S. KELLY COMPANY, OF SAME PLACE.

CRUSHING AND GRINDING MILL.

SPECIFICATION forming part of Letters Patent No. 457,146, dated August 4, 1891.

Application filed May 19, 1888. Serial No. 274,432. (No model.)

To all whom it may concern:

Be it known that I, THOMAS C. CADWGAN, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Crushing and Grinding Mills, of which the following is a specification.

My invention relates to crushing and grinding mills; and it particularly relates to that class of mills adapted to crushing and grinding ear-corn, cotton-seed, herbs, and similar substances.

The objects of my invention are to provide for feeding fibrous or adhesive substances and prevent the same from bridging over in the hopper.

The further object of my invention is to provide a novel means for regulating the quantity of material fed to the grinding-disks.

The further object of my invention is to provide a mechanism of novel construction adapted to crush substances of different kinds and varieties.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a crushing and grinding mill embodying my invention. Figs. 2 and 3 are respectively longitudinal and transverse sectional views of the same, the feed-plate being, however, omitted from the construction shown in Fig. 2. Fig. 4 is a perspective view in detail of the hopper and feeding and crushing mechanism therein contained. Fig. 5 is a detail view in perspective of the feed-regulating plate and means for operating the same. Fig. 6 is a transverse sectional view of the same. Fig. 7 is a detail view of a feed-slide-operating device. Fig. 8 is a partial bottom view of the feed-plate and its regulating-slide. Fig. 9 is a detail view of the feed-plate-supporting mechanism.

Like parts are indicated by similar letters of reference in the several views.

In the said drawings, A represents the hopper in which the material to be crushed and ground is placed. B B′ are intergeared crushing-rolls located at the bottom of the said hopper and above a secondary crusher C on the main shaft C′, which crusher also acts as a conveyer and carries the material to the grinding-disks D D′, also supported on main shaft C′.

In grinding fibrous materials, and epecially unhulled cotton-seed, difficulty is encountered in feeding the same equally to the crushing and grinding mechanism because of the tendency of the material to bridge over the hopper and stop the action thereon of the feeding and crushing rolls. To overcome this difficulty, I provide my improved mill with vibrating sides E E′, hinged to the hopper A in connection with the crushing and feeding rolls B B′ and adapted by the revolution of the said rolls to be forced inwardly and then gravitate outwardly in the said hopper, producing an alternate compression and relaxation of the material in the hopper, causing the same to fall in a regular manner into the crushing and feeding rolls. These vibrating sides are preferably made of sheet metal hinged at *a a* to the sides of the hopper A and each provided at its lower edge with projecting fingers *a′*, adapted to be engaged by projections *b* on the crushing-rolls B B′. The crushing-rolls B B′ receive their motion through a belt connection *c*, pinion *c′*, spur-gear c^2, and intermeshing gears c^3 from the main shaft C′, and are thus caused to revolve in opposite directions toward the center of the hopper A, as indicated by the arrows in Fig. 3. It will be seen that as the said crushing and feeding rolls are revolved the protuberances *b* thereon, coming in contact with the projecting fingers *a′*, will cause an inward and outward movement of the sides or leaves E E′.

In grinding some kinds of material—for instance, shelled corn or other cereals—it becomes necessary to provide means for regulating the supply of material fed to the supplemental crusher C and grinding-disks D D′. To accomplish this I provide a hinged feed-plate F directly under the crushing and feeding rolls B B′ and provide in one corner of said feed-plate an opening F′, over which is adapted to slide a supplemental plate or regulator F^2. This supplemental plate or regulator F^2 is provided with slotted ways or guides *d* and suitable fastening-bolts *d′*, by which it is secured to the feed-plate F and at the same time permitted to slide thereon. It is also

provided on one side with a projecting finger d^2, adapted to be engaged by a bifurcated arm d^3 on the inner end of a small shaft d^5, which projects through the walls of the inclosing casing and is provided on the outer end with a hand-wheel d^7. When the hinged plate F, therefore, is in the position shown in Figs. 4 and 5, the opening F′ may be readily regulated to suit the quantity of corn to be fed through the same by turning the wheel d^7. As above stated, the plate F is hinged to the sides of the casing, preferably at the points *e e*, as shown in Figs. 5 and 6. Extending downwardly and backwardly from the under side of said plate is a curved arm e', formed on the arc of a circle from the axis of the hinge *e e*. This arm is provided with notches e^2, adapted to be engaged by a suitable latch or fastening e^3, located on the outside of the outer casing, which incloses the feeding-chamber. When feeding small grain, the plate is turned to the position shown in Figs. 5 and 6 and held therein by the latch e^3, Fig. 9, engaging with the outer notch e^2 in the said arm e'. In feeding ear-corn or larger material the latch e^3 is withdrawn from engagement with the arm e' and the plate F is allowed to drop down parallel with the side of the chamber, and is held in this position by the latch e^3, which engages with the inner notch e^2 in said arm, thus leaving the passage from the feed-chamber to the supplemental crusher free and unencumbered.

I have shown two crushing or feeding rolls in the drawings; but one only may be used, if desired. The feeding or crushing rolls, in connection with the conveyer and crusher in the chamber below, serve to reduce material of various kinds—such as ear-corn, cotton-seed cake, bones, or other substances—to a suitable size for grinding before the same is carried to the grinding-disks.

Having thus described my invention, I claim—

1. The combination, in a crushing and grinding mill, substantially as described, with the intergeared feeding and crushing rolls having projections *b* adapted to turn in opposite directions in the feeding-hopper, of the vibrating sides hinged in said hopper and having fingers a' adapted to be engaged by the projections of said feeding-rolls to produce a vibratory movement thereof, substantially as specified.

2. The combination, with the supplemental crusher and grinding-disks on the main shaft, of the intergeared feeding and crushing rolls above said crusher and connected thereto, projections on said crushing-rolls, and hinged vibrating sides in said hopper having projecting fingers adapted to engage with said projections of the crushing and feeding rolls, substantially as set forth.

3. The combination, with the hinged plate F, of the supplemental slide or regulator F^2, secured to said hinged plate, the projecting finger on said supplemental slide, the bifurcated arm adapted to engage said finger, and a hand-wheel provided with a journal extending through the outer casing on said arm, substantially as specified.

4. The combination of the hinged feeding-plate having the curved and notched arm, a fastening device adapted to hold the same in different positions of adjustment, the supplemental slide on said feeding-plate, the projecting finger on said slide, the bifurcated arm adapted to engage said finger, and the hand-wheel connected to said arm and extending through said casing, substantially as set forth.

In testimony whereof I have hereunto set my hand this 16th day of May, A. D. 1888.

THOMAS C. CADWGAN.

Witnesses:
PAUL A. STABY,
CHASE STEWART.