(No Model.)

T. C. CADWGAN.

CRUSHING AND GRINDING MILL.

No. 453,620. Patented June 9, 1891.

Fig. 1

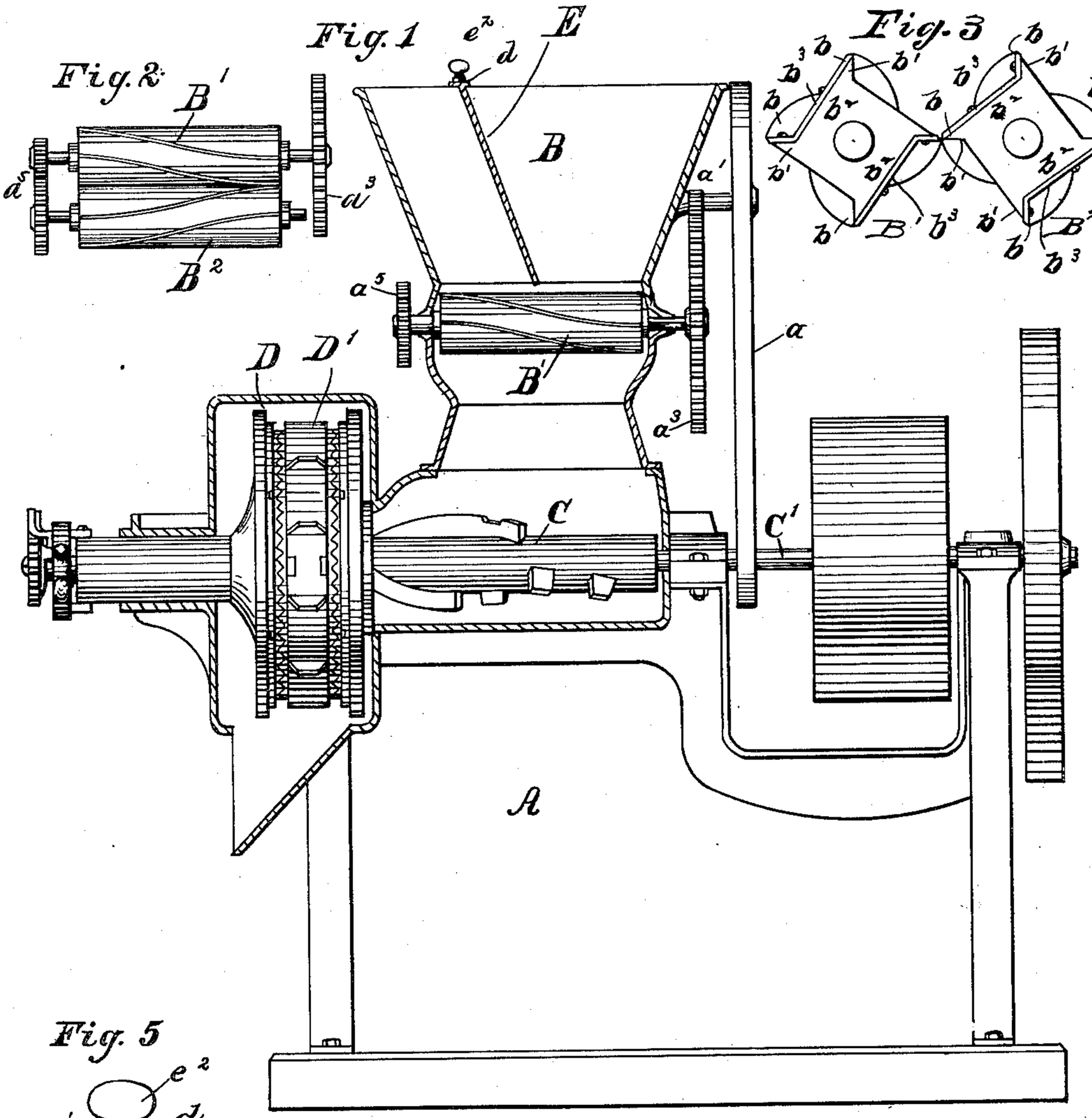


Fig. 2

Fig. 3

Fig. 5

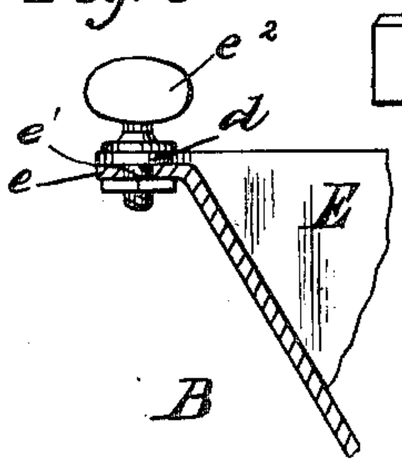
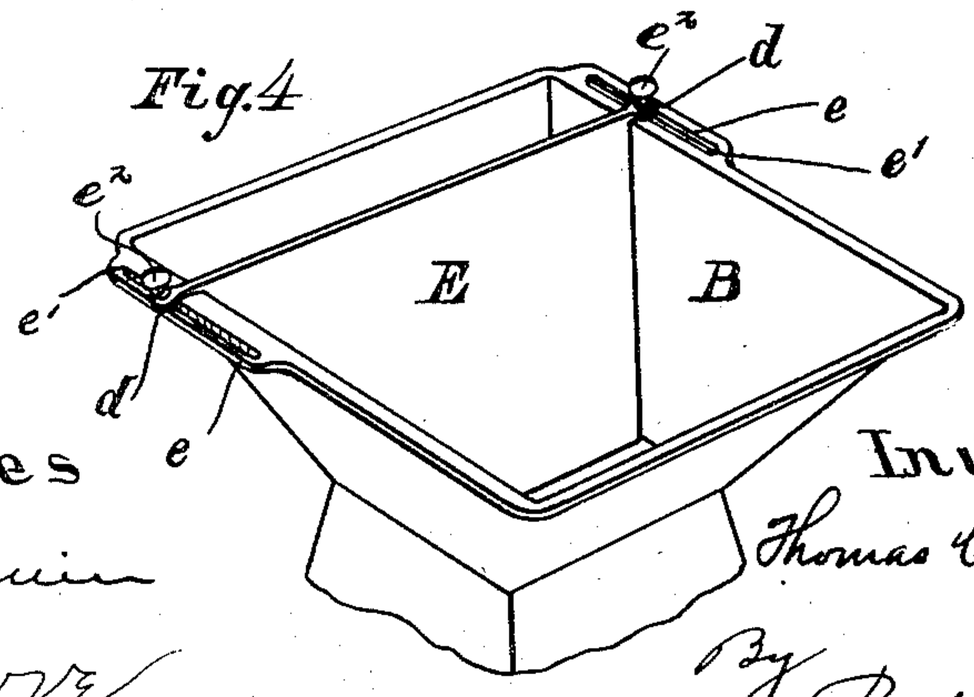


Fig. 4



Witnesses

Chas. L. Goessler

W. D. Grove

Inventor

Thomas C. Cadwgan

By Paul A. Staats & Co
Attys

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. 453,620, dated June 9, 1891.

Application filed May 19, 1888. Serial No. 274,431. (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 designed for crushing and grinding corn on the cob and similar substances.

The object of my invention is to provide a mill having crushing-rollers of novel construction arranged between the hopper and the grinding-disks, adapted to crush corn in the ear and at the same time cut up the husks, so that the corn, cob, and husks may all be ground to a fineness sufficient for feed.

The further object of my invention is to provide means for varying the quantity of material fed to the grinding mechanism by varying the capacity of the hopper in a novel manner hereinafter set forth. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a mill embodying my invention. Fig. 2 is a plan view of the crushing-rolls. Fig. 3 is an end elevation of the same. Fig. 4 is a perspective view of a hopper in detail. Fig. 5 is a detail sectional view of the same.

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

In the said drawings, A represents the main frame of the machine, on which the several parts of the mill are supported.

B is the hopper, and B′ and B² are crushing-rolls located at the bottom thereof.

Immediately under the crushing-rolls and located in a suitable chamber is a supplemental crusher C, supported on the main shaft C′, which also carries the grinding-disks D D′ in a well-known manner, and as more fully set forth in my prior patent, No. 323,561, dated August 4, 1885. The power to drive the crushing-rolls is transferred from the main shaft C′ by a small belt *a*, operating upon a suitable pulley and counter-shaft *a′*, carrying a pinion a^2, which meshes in a spur-gear a^3 on one of the rolls B′, the said rolls B′ and B² being geared together at the rear end by spur-pinions a^5.

In order to provide for crushing the material and at the same time furnish means for chopping up the corn-husks and other small substances, I provide each of the crushing-rolls with a series of spiral cutting-knives *b*, the said knives being so constructed and arranged that the blades of the respective cylinders come together in a horizontal plane passing through the axis of said rollers, thus forming a shearing cut at this point. The rolls are each preferably provided with four blades or cutters *b*. These I preferably construct, as shown in Fig. 3, by forming on the roll proper a series of spiral-shaped ribs or projections *b′*, corresponding to the number of blades, the said ribs being connected together by a series of supporting-faces b^2. The cutting-blades *b* are formed of L-shaped plates b^3, the short flange of which is adapted to project upwardly in front of one of the ribs *b′* and form one cutting-edge, while the extended flange is adapted to project upwardly beyond the next succeeding rib and form another cutting-edge. (See Fig. 3 for detail.) The L-shaped plates b^3 are secured on the supporting-faces b^2 by bolt-screws or in any other suitable manner. By this construction it will be seen that two cutting-edges are formed on a single plate and in such a manner that they may be readily removed or replaced for sharpening or renewing the cutting-edges.

It sometimes happens that it is desirable to regulate the quantity of material fed to the grinding-mill, as some kinds of material may be ground more readily than others. In order to arrange for varying the quantity of material fed to the grinding device, I provide means for varying the size of the hopper without changing the angle thereof, thus changing the amount of surface on the grinding-rolls exposed, by means of which the material is crushed and fed to the grinding mechanism below. This I accomplish by a movable side or partition E, located within the hopper B and provided at the top with projecting ears or flanges *d*, which project over and rest upon the top of the hopper B. Located at the top

of the hopper B, on either side, is a projecting flange *e*, provided with a longitudinal slotted opening *e'* therein. The projecting ears *d* on the movable partition E rest upon the flanges *e*, and are adapted to be secured at any point along the slotted opening *e'* by a clamping-screw e^2, which projects through a suitable opening in the ear *d* and through the slotted opening *e'*. By this construction it will be seen that the sides of the hopper may be varied as desired, and the capacity of the feed-rolls varied, so as to feed a greater or less quantity of material into the supplemental crusher C, thence into the grinding-disks D D'.

Having thus described my invention, I claim—

1. In a crushing and grinding mill, intergeared crushing-rolls, each provided with spirally-shaped ribs thereon, the L-shaped plates adapted to form the cutting-edges projecting beyond said ribs, substantially as specified.

2. The combination, in a crushing and grinding mill, of the intergeared crushing-rollers, each provided with spirally-shaped projecting ribs and supporting-faces, the L-shaped plates secured to said supporting-faces and adapted to project outwardly at the front and rear, respectively, of the succeeding projecting ribs and form cutting-edges therefor, substantially as set forth.

3. The combination, in a crushing and grinding mill with the intergeared crushing mechanism, of a hopper above said crushing mechanism, a variable partition with extending ears projecting over the top of said hopper, slotted flanges at the top of said hopper, and a clamping device passing through said slotted opening, substantially as and for the purpose set forth.

4. The combination, in a crushing and grinding mill, of the intergeared crushing-rolls located between the hopper and the grinding-disks and a variable partition in said hopper, substantially as and for the purpose 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. STALEY.
CHASE STEWART.