(No Model.) 2 Sheets—Sheet 1.

J. M. CASE.

GRINDING MILL.

No. 297,756. Patented Apr. 29, 1884.

Fig. 1.

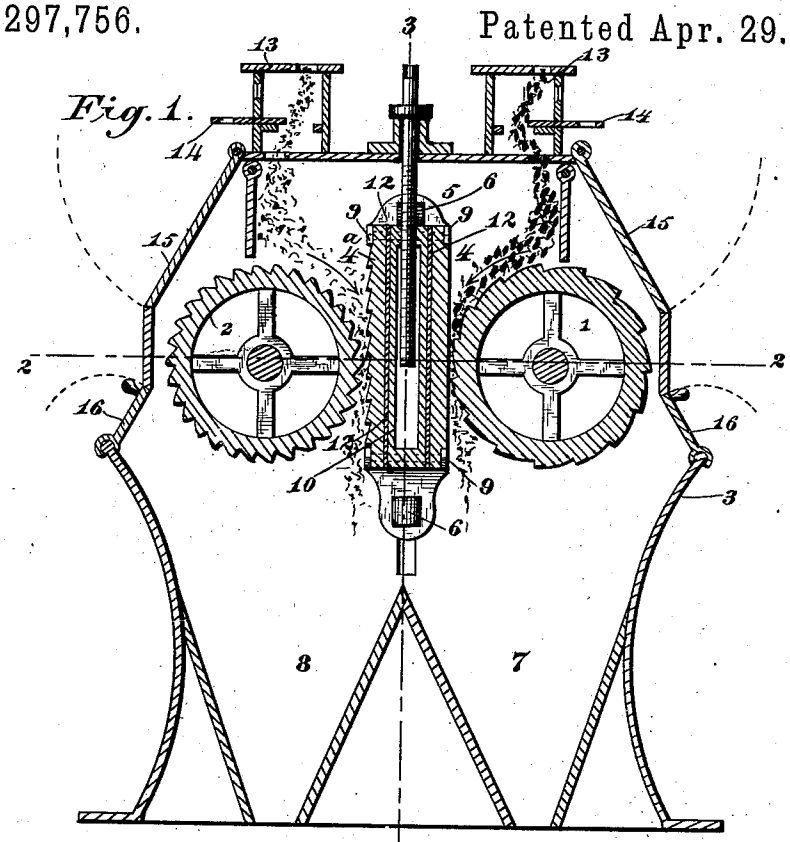
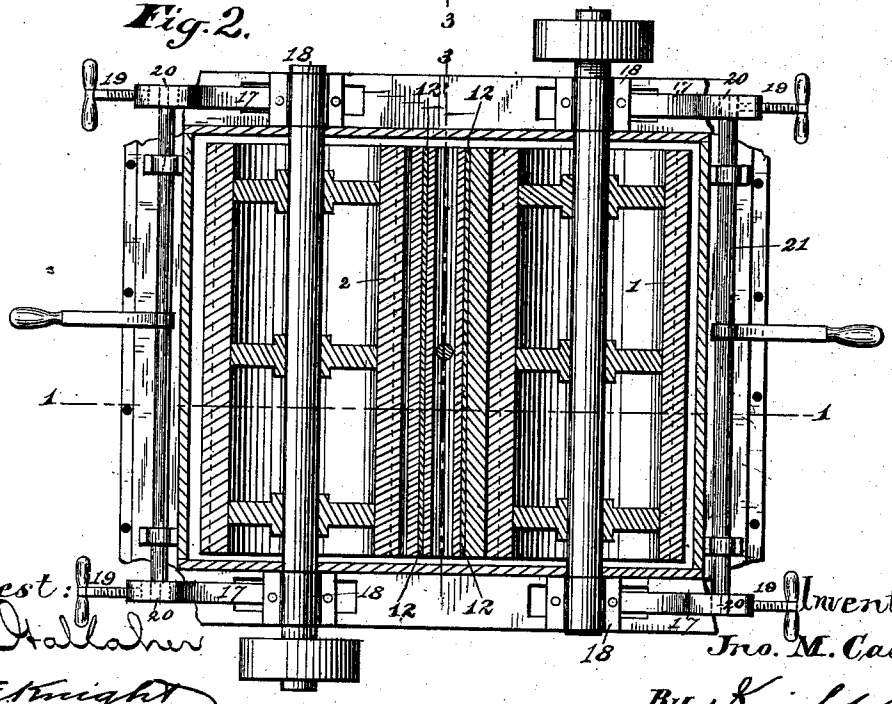


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

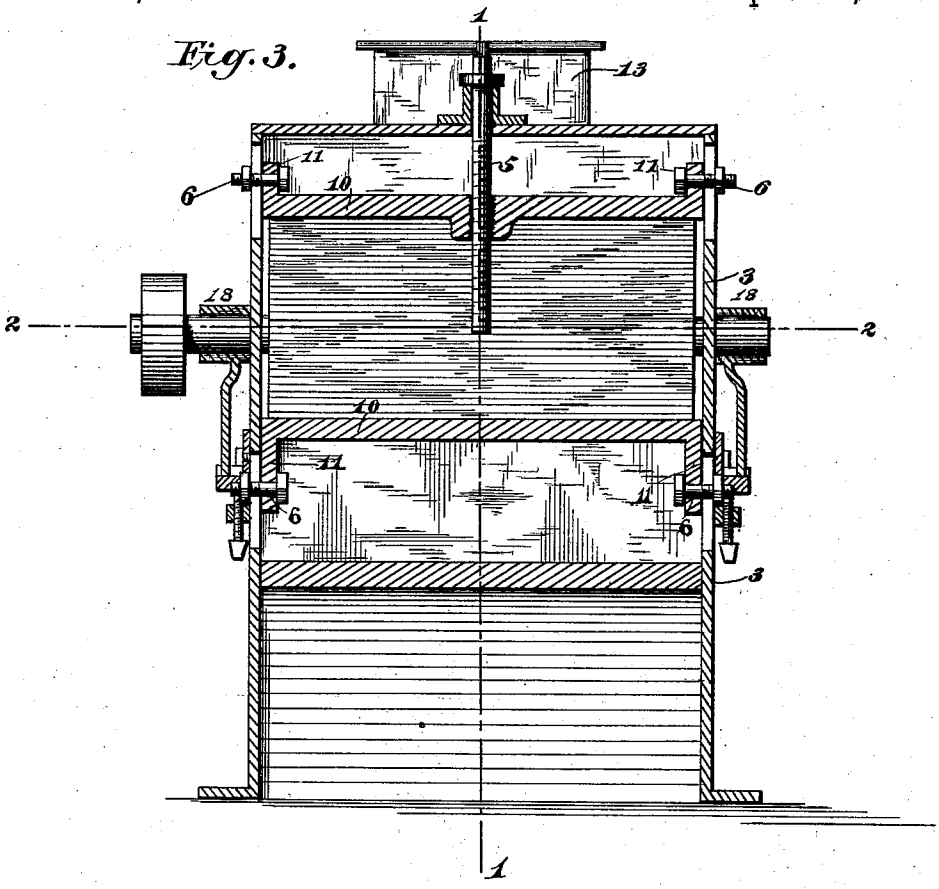
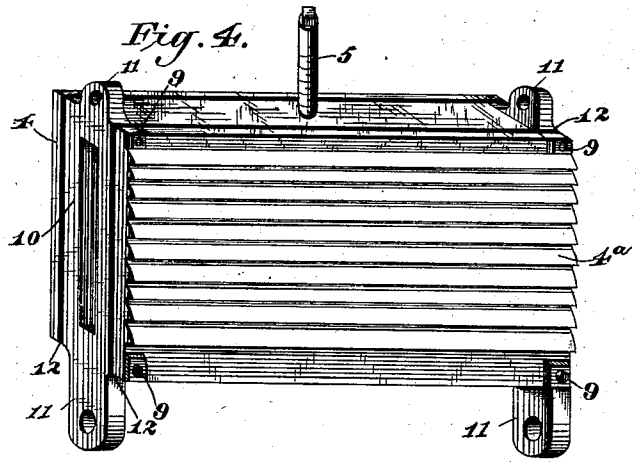


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN M. CASE, OF COLUMBUS, OHIO, ASSIGNOR TO THE CASE MANUFACTURING COMPANY, OF SAME PLACE.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 297,756, dated April 29, 1884.

Application filed May 31, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. CASE, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Grinding-Mills, of which the following is a specification.

The subject of my invention is a grain breaking or reduction machine constructed with a pair of revolving grinding-rolls working against the opposite faces of a stationary plate interposed between them and extending above and below the horizontal plane of their axes, as hereinafter described. The interposed plate is adjustable vertically by means of one or more screws, so as to bring the different parts of its surface into action between the rolls, and it is furthermore provided with clamp-bolts for securing it in any position in which it may be set. The interposed grinding-plate consists of a frame or back, to which are screwed surface-plates, which may be either smooth or corrugated. I prefer to employ one smooth and one corrugated surface or grinding-plate on the respective sides or faces. Between the surface-plates and the frame or back to which they are attached are interposed packings of rubber or like yielding material, to take up the jar and prevent noise. By extending the grinding-plate above and below the grinding-surfaces of the rolls, the machine is divided into two separate and distinct compartments, and I am thus enabled to provide a gradual-reduction machine which is adapted to act successively on the material, suitable conveyers, elevators, and feed mechanism being employed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a vertical transverse section of a machine illustrating my invention, on the line 1 1, Figs. 2 and 3. Fig. 2 is a horizontal section of the same on the line 2 2, Figs. 1 and 3. Fig. 3 is a vertical longitudinal section on the line 3 3, Figs. 1 and 2. Fig. 4 is a perspective view of the interposed grinding-plate removed.

1 and 2 represent revolving grinding-rolls corrugated with teeth of different sizes, and mounted in adjustable bearings, such as hereinafter described, adapted to crush the grain against the respective faces of a grinding-plate interposed between them and extending above and below the horizontal plane of their axes. The interposed grinding-plate is adjustable vertically by means of a screw, 5, resting by a collar near its upper end on a boss on the top of the frame, and provided at the top with a hand-wheel or key-square for turning it. Clamp-bolts 6 6, passing through holes in lugs 11, formed on the frame 10, and through vertical slots in the casing 3, and receiving nuts on their outer ends, fix the plate in any position in which it may be set.

The interposed grinding-plate is preferably constructed of surface-plates 4 4^a, removably secured by bolts 9 to a central frame or back, 10, in which the adjusting-screw 5 is threaded, and on which are formed the lugs 11, for receiving the clamp-bolts 6.

Between the surface-plates 4 and 4^a and the central frame or back, 10, are interposed cushions or packings 12, of rubber or like yielding material, for the purpose of taking up the jar from the rolls and preventing noise. It is obvious, however, that this interposed grinding-plate may be made solid without departing from my invention.

By the employment of two adjustable grinding-rolls crushing against the opposite faces of a stationary grinding-plate interposed between them, and extending for a suitable distance above and below them, I am enabled to effect two successive breaks or reductions of the material, said plate serving as a partition for dividing the machine into two separate and independent compartments. The use of the interposed plate, therefore, is made to do the work of an additional pair of rolls, and the cost of making it is materially less. Another important advantage is that by the use of such a grinding-plate a machine of the capacity of a four-roller mill may be made, occupying a little more than one-half the space.

It is found advantageous to employ a smooth plate, 4, for the first break-roll, 1, to work against, and a corrugated plate, 4^a, for the second break-roll, 2.

The feed-hoppers 13 may be of any suitable construction, and may be provided with customary regulating slides, 14. If preferred, I may employ a vibrating feed-box such as I have described in my application No. 96,699, of even date herewith.

15 15 represent doors for inspecting the feed, and 16 16 doors for inspecting the material delivered from the respective rolls.

The means for adjusting the distance asunder of the rolls and leveling them I have described and claimed in my application No. 96,699, above referred to. The adjusting device consists of links 17, secured at one end to the boxes 18, and having at their other ends adjusting-screw followers 19, which bear against the eccentric ends 20 of a transverse shaft, 21, which is anchored to the case 3. This constitutes the means for holding them at the proper distance asunder. A spring (not here shown) is placed underneath each of these links, and bears at one end against the box 18 and at the other end against a fixed lug on the case, for holding the rolls in proper grinding position with a yielding pressure.

The lower part of the case is formed with two delivery-spouts, 7 8, for receiving the material from the respective rolls 1 2.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a grain breaking or reducing machine, the combination of a pair of grinding-rolls and a stationary grinding-plate interposed between said rolls and extending above and below the horizontal plane of their axes, as and for the purpose set forth.

2. In a grain breaking or reducing machine, the combination of a pair of grinding-rolls and a stationary grinding-plate having parallel faces interposed between said rolls and extending above and below the horizontal plane of their axes.

3. In a grain breaking or reducing machine, the combination, with a pair of rolls and a grinding-plate interposed between the adjacent faces of said rolls and extending above and below the horizontal plane of their axes, of means for adjusting said plate vertically, as set forth.

4. In a grain breaking or reducing machine, the combination, with a pair of rolls, a grinding-plate interposed between said rolls and extending above and below the horizontal plane of their axes, and means for adjusting said plate vertically, of means for locking it in any position in which it may be set, as described.

5. In a grain breaking or reducing machine, the combination, with a pair of grinding-rolls and a stationary grinding-plate interposed between the adjacent faces of said rolls and extending above and below the horizontal plane of their axes, of means for adjusting the distance asunder of the rolls.

6. In a reduction-machine, the combination, with two rolls, of a grinding-plate for use between them, constructed of a central frame and removable face or grinding-plates, as set forth.

7. In a reduction-machine, the combination, with two rolls, of a grinding-plate for use between them, constructed of a central frame, removable face or grinding-plates, and suitable elastic packing interposed between said plates and frame, as set forth.

8. In a gradual-reduction machine, the combination of casing 3, hopper-spouts 13 13, rolls 1 2, interposed grinding-plate, and delivery-hoppers 7 8, all constructed and arranged substantially as herein shown and described.

JOHN M. CASE.

Witnesses:
OCTAVIUS KNIGHT,
HARRY E. KNIGHT.