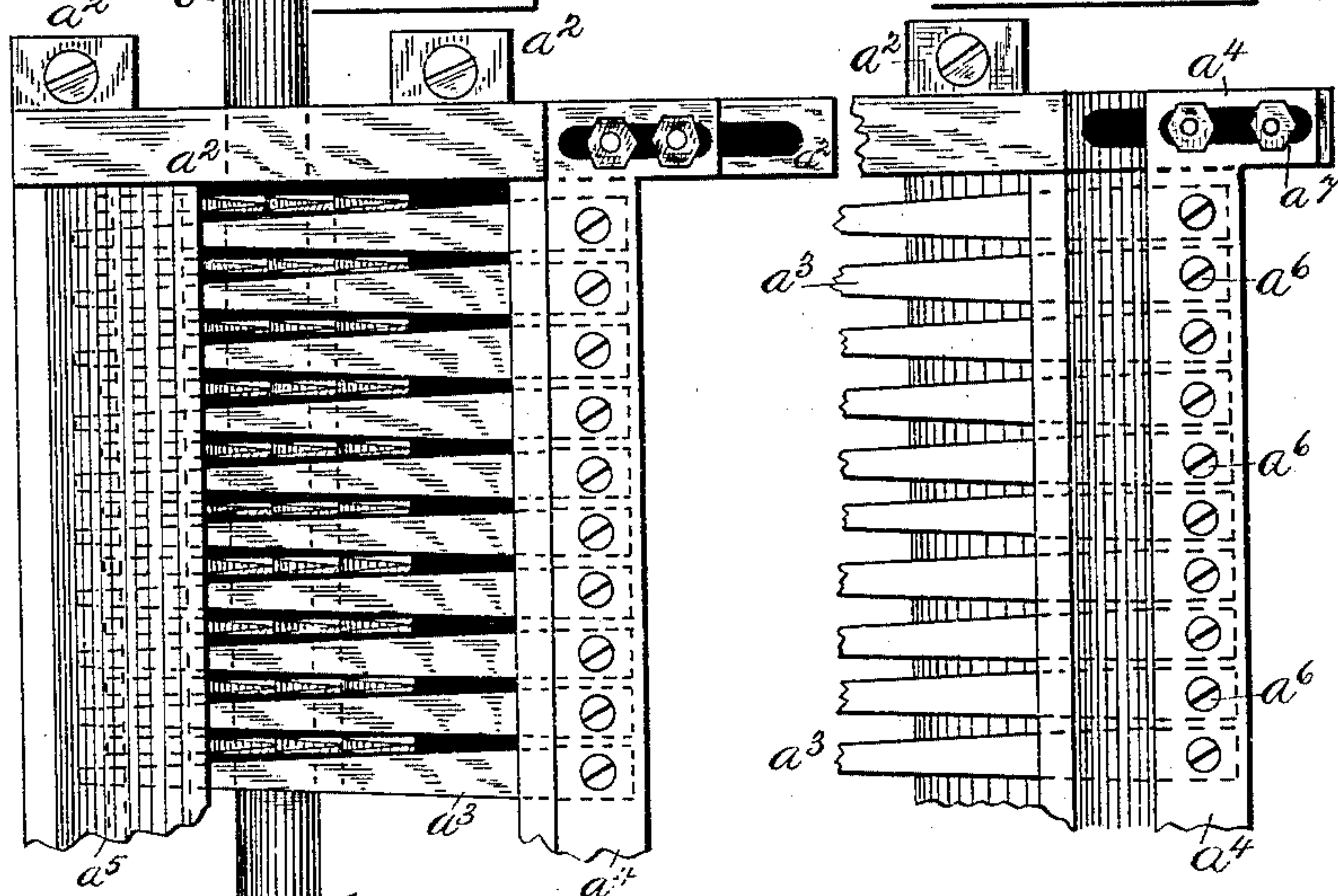


2 Sheets—Sheet 1.

CLEANING, HULLING, AND GRINDING MILL.

Patented Oct. 13, 1885.



Jos. H. Blackwood, del.
 R. G. DuBois.

INVENTOR
Joseph Breitenmoser
By his Attorney
W. M. Doolittle

(No Model.)

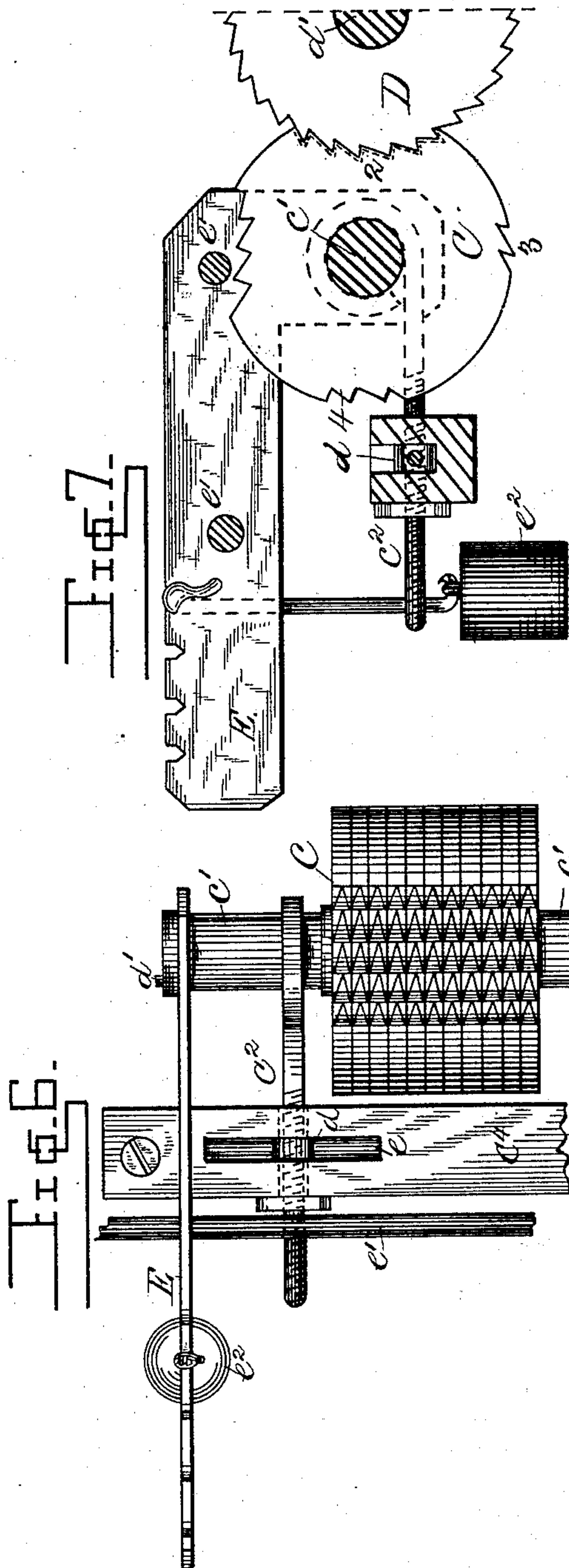
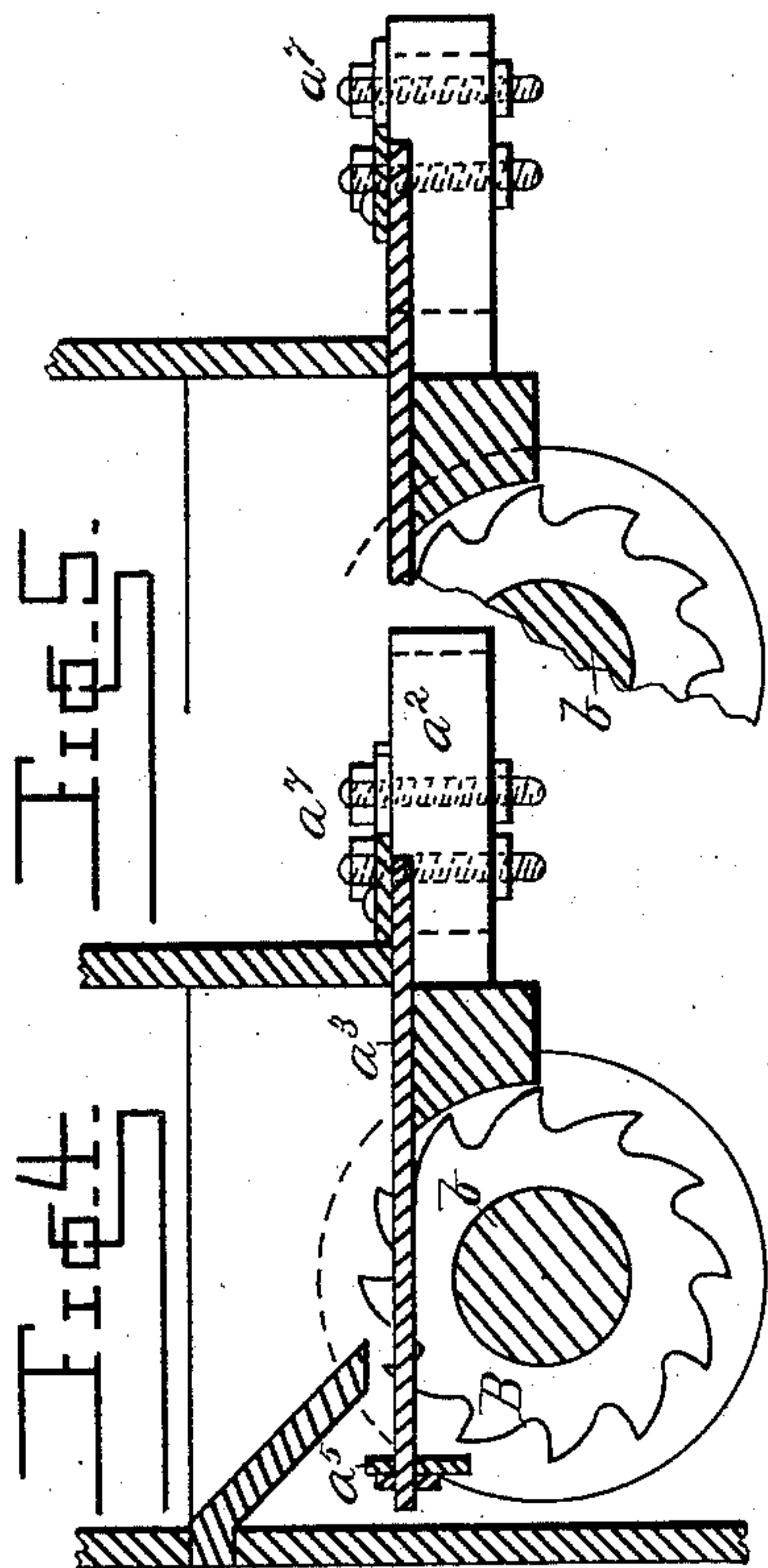
2 Sheets—Sheet 2.

J. BREITENMOSER.

CLEANING, HULLING, AND GRINDING MILL.

No. 328,105.

Patented Oct. 13, 1885.



WITNESSES

John H. Blackwood del
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UNITED STATES PATENT OFFICE.

JOSEPH BREITENMOSER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-THIRD
TO WILLIAM H. DOOLITTLE, OF WASHINGTON, D. C.

CLEANING, HULLING, AND GRINDING MILL.

SPECIFICATION forming part of Letters Patent No. 328,105, dated October 13, 1885.

Application filed October 31, 1882. Serial No. 75,547. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BREITENMOSER, a citizen of the United States, residing at St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in Cleaning, Hulling, and Grinding Mills; and I 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 appertains to make and use the same.

The object of my invention is to construct a machine which may be used for cleaning, hulling, and crushing or grinding cotton and other seeds, and to embody in one machine the functions of several, thus to make one machine do the work which has hitherto been usually done with separate cleaning and hulling machines and crushing and grinding mills.

In the accompanying drawings, which illustrate my invention, Figure 1 is a longitudinal vertical section of the machine; Figs. 2 and 3, top views, partly in section, of the set of fingers at the bottom of the hopper; Figs. 4 and 5, sectional side views of the feed-box and feed-roller; Fig. 6, a top view of the stationary cutting and crushing roller and attachments, and Fig. 7 a side view, partly in section, of the same roller and its connections in position relatively to the opposite revolving roll.

Like letters designate corresponding parts in all of the figures.

On a suitable frame-work is mounted a feed box or hopper, A. To the bottom of this hopper is secured a small frame, a^2 , on the top of which is attached a set of bars or fingers, a^3 , their ends secured to two metallic strips, $a^4 a^5$, as more plainly shown in Figs. 2 and 3. These fingers are tapering in form, and each finger at its larger end is secured to the under side of the flat plate a^4 by a screw, a^6 , and the opposite ends of the fingers enter holes in upright strip a^5 and are secured thereto by nuts. The flat strip a^4 is attached to the frame a^2 by set-screws a^7 , arranged in slots, as shown in Figs. 2 and 3. Thus the whole set of tapering fingers can be moved backward and forward and set to admit of the introduction of various-sized seeds or grain to the cleaning

and crushing rolls. Each finger being secured separately to the strips $a^4 a^5$ by screws and nuts, the distance between each pair of fingers can be increased, if desired, by removing one or more of the fingers and rearranging the remaining ones.

B is a feeding-roll consisting of separate disks, provided with saw-like teeth, mounted on shaft b . These disks may be slipped over the shaft b , separated by rings, and held firmly together by the use of nuts on the ends of the shaft b . The teeth a^3 extend up between the fingers, as shown in Figs. 1 and 4, and when the roll revolves draw the seed, with its adhering lint or other covering, down to the pair of rolls below.

C and D represent the rolls just mentioned. C is a stationary roll mounted on shaft c' . It is composed of separate removable disks provided with different sets of teeth, 1, 2, 3, and 4. These different toothed surfaces of the stationary roll C are curved inward to conform to the periphery of the rotating roll D, as shown in Figs. 1 and 7. A greater or smaller number may be employed. These sets differ in their number of teeth, which are for the purpose of varying the degree of fineness to which the seeds are to be broken or ground, as hereinafter described. The shaft c' , on which this roll is mounted, is supported in the bearings $c^2 c^2$, which consist of rods with screw ends passed through the cross-piece c^4 back of the frame, and secured thereto by nuts, as shown in Figs. 1 and 6, the opposite ends of said rods being turned up to form the bearings for the shaft c' , which turns loosely therein. The teeth on both rolls are arranged to move in the grooves formed between the teeth of the opposite roll. The teeth on the roll D are also formed on disks mounted on shaft d' . The disks on both rolls are slid closely together on their respective shafts, and held so by screw-nuts on the ends of the shafts. The advantage of constructing the teeth on disks is that each can be separately removed to sharpen the teeth or be replaced by a new disk if teeth be broken.

E E are arms loosely keyed on the ends of shaft c' within the frame, and connected by rod e' , which rod, although shown extending

across back of the frame, may be placed to connect the arms E E at their inner ends, running directly over the roll C. The arms E E run back through slots in the back of the frame, and are provided at their outer ends with weights e^2 . The shaft c' turns loosely in its bearings on the rods $c^2 c^2$ and in the arms E E, and the object of arms E E, with their weights, is to hold the face of the roll C normally against the roll D; but when a nail or other hard substance that cannot be crushed falls between the rolls C and D the increased pressure of the rolls against such substance overcomes the resistance by which the roll C is held by the weights against roll D, and, forcing the roll C downward and backward, the substance falls through between the rolls, and then the weights, acting like a spring, force the rolls together again. To further admit of this rocking and sliding motion of the roll C, the rods $c^2 c^2$ move to and fro, to aid which movement the said rods pass through smooth rings d , placed in slots e formed in cross-pieces c^4 .

When it is desired to move one or the other sets of teeth of roll C against the face of roll D, it is done by the use of a key shaped to fit on projection d' on the end of shaft c' , by which means said shaft is turned the proper distance.

In operating on the seeds, which are introduced into the hopper A after regulating the fingers a^3 to the proper size of the seeds, if it is desired to simply clean the seeds, the roll C is separated a sufficient distance from roll D by moving back the screw-rod bearings c^2 to permit the seeds to pass between the rolls without being crushed. If it is desired to simply hull the seeds, the roll C is set a little closer to roll D. When it is desired to coarsely crush or grind the seeds of cotton, corn, barley, wheat, oats, or other seed, the rolls are placed still closer, and the degree of fineness to which it is desired to grind the seeds is attained by the employment of the different grades or sets of teeth on roll C, the teeth increasing in number in each, as herein shown.

When it is desired to grind the seeds very fine or pulverize them, the rolls C and D are reversed, so as to present the back of their teeth to the grooves in the opposite roll, roll C is adjusted near to the roll D, with its greatest number of teeth presented thereto, and roll D is made to move more slowly than usual.

In practice two machines may be employed, if desired, one adjusted to clean or hull the seeds or grain, and the other adjusted to grind the material thus cleaned.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine for the purpose herein specified, the hopper, in combination with a set of

adjustable tapering fingers arranged across the bottom of this hopper, substantially as and for the purpose herein specified.

2. The combination, with the hopper, of the set of tapering fingers arranged across the bottom of the hopper, and adapted to be adjusted both longitudinally and laterally, substantially as and for the purpose herein specified.

3. The combination of the hopper, the set of tapering fingers, and the feed-roll having disks with saw-like teeth adapted to revolve between the fingers and project above the same, substantially as and for the purpose herein specified.

4. The combination of the hopper, the set of adjustable tapering fingers, and the feed-roll having disks with saw-like teeth adapted to revolve between the fingers and project above the same, substantially as and for the purpose herein specified.

5. The combination of the hopper, the set of tapering fingers adapted to be adjusted laterally, and the feed-roll composed of disks with saw-like teeth adapted to be adjusted to revolve between the fingers and project above the same, substantially as and for the purpose herein specified.

6. The combination of the stationary adjustable roll having different sets of teeth, and the revolving roll having teeth which work between the teeth of the stationary roll, substantially as and for the purpose herein specified.

7. The combination, with the roll D, of the adjustable roll C, having sets of teeth differing in number arranged on its periphery, and so placed as to conform with the periphery of the roll D, substantially as and for the purpose herein specified.

8. The combination of the rolls C D, composed of removable and reversible disks, substantially as and for the purpose herein specified.

9. The stationary roll C, composed of a set of removable and reversible disks or plates, each disk or plate having several sets of teeth differing in number, in combination with the rotating roll D, composed of a set of removable and reversible toothed disks or plates, substantially as and for the purpose herein specified.

10. The combination of the stationary roll resting in adjustable bearings, and graduated arms and weights, substantially as and for the purpose herein specified.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH BREITENMOSER.

Witnesses:

JNO. W. SIMS,

L. A. SWARTZELL.