

A. HUNTER.

FLOUR DRESSING MACHINE.

No. 300,371.

Patented June 17, 1884.

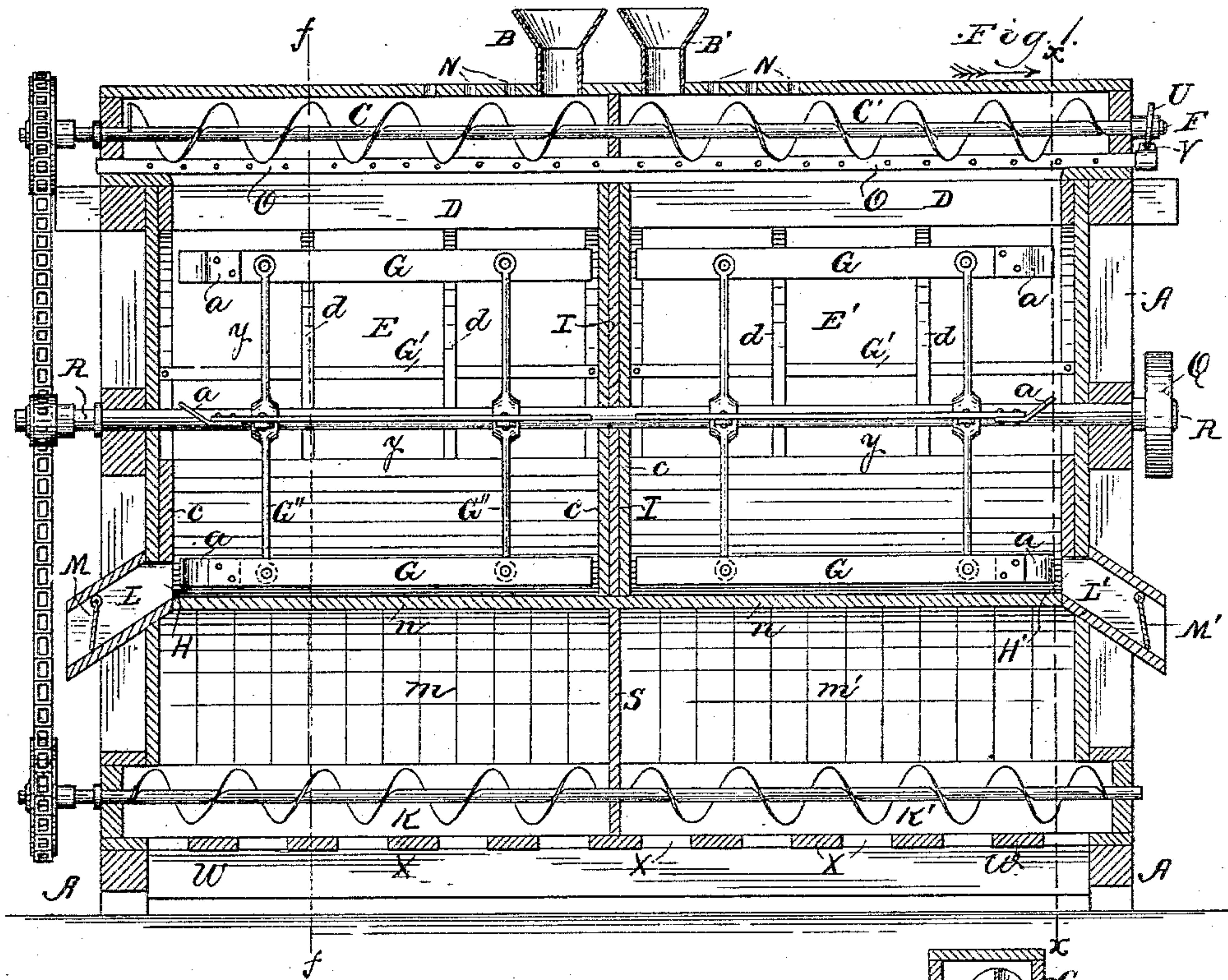


Fig. 2.

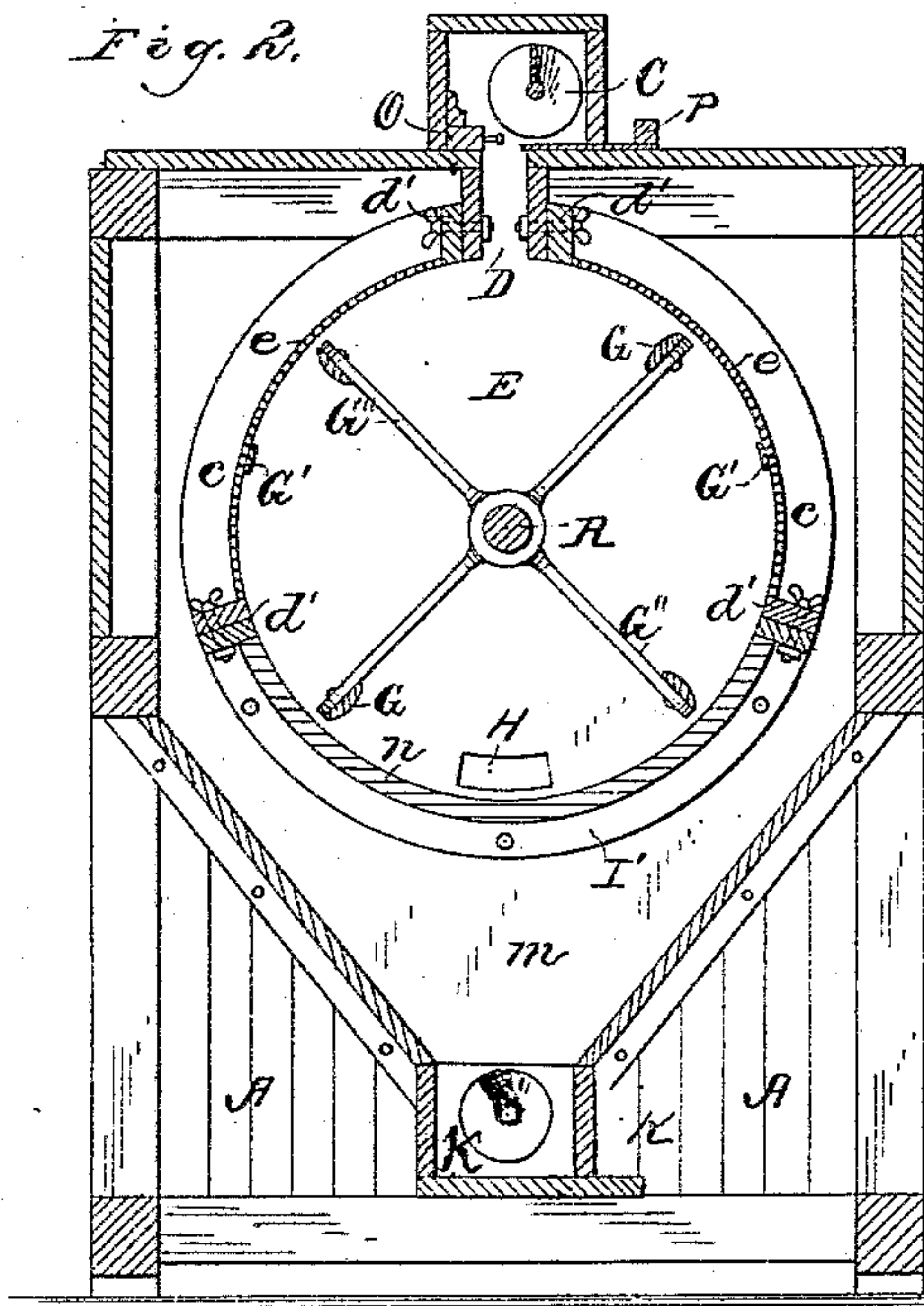


Fig. 3.

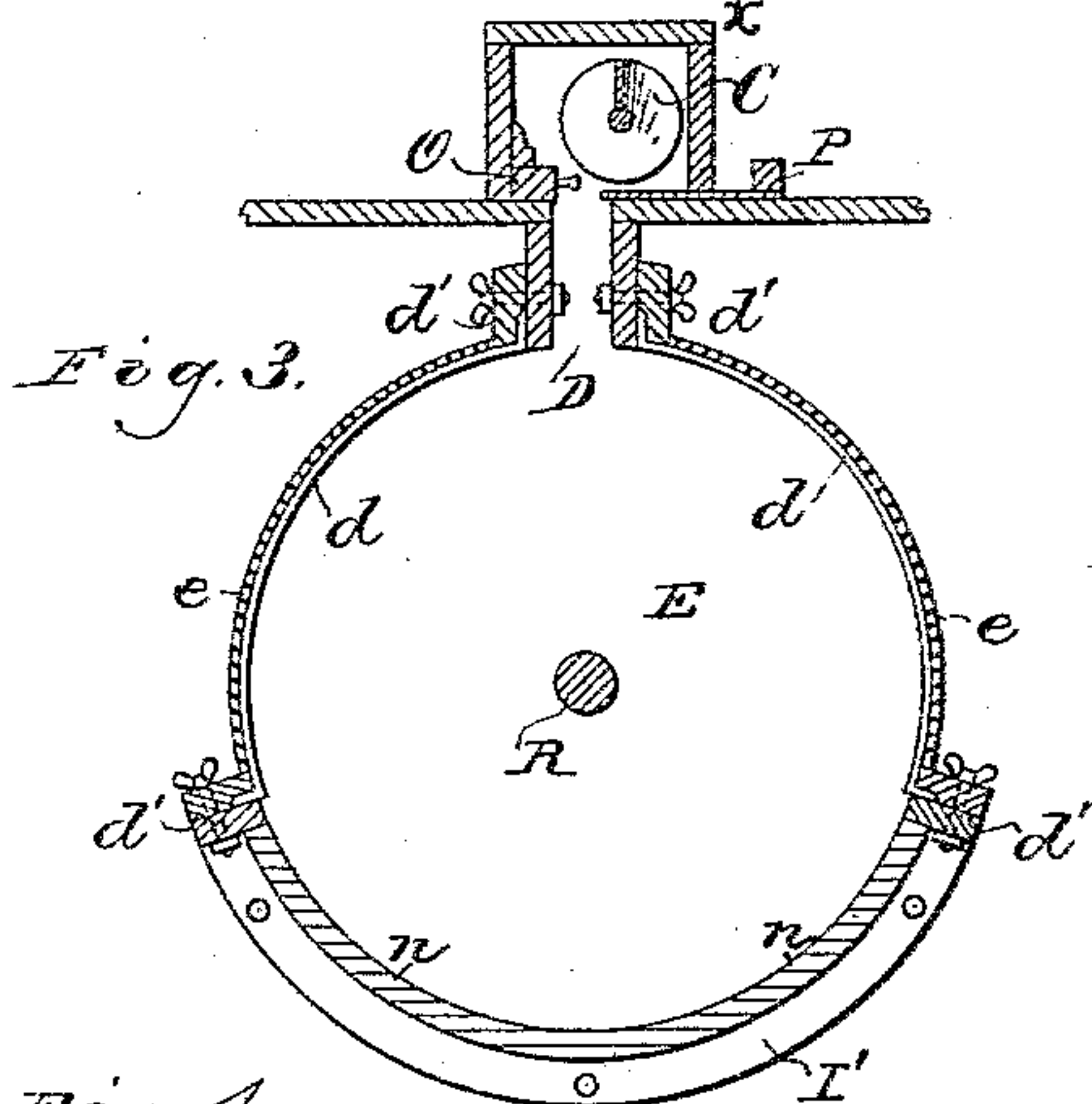


Fig. 4.

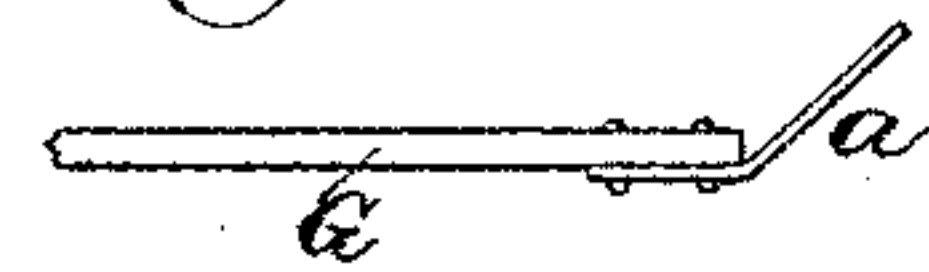


Fig. 5.

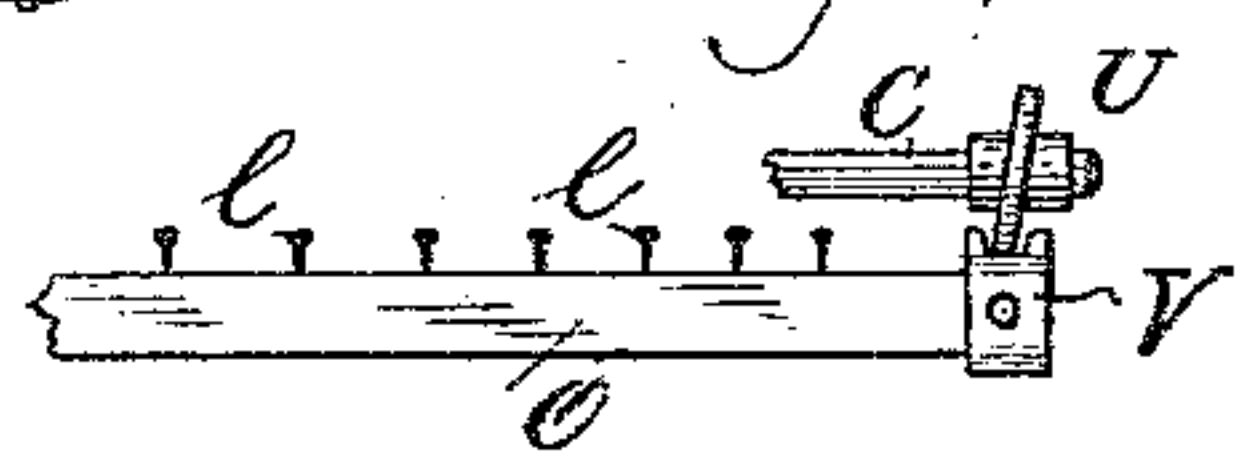
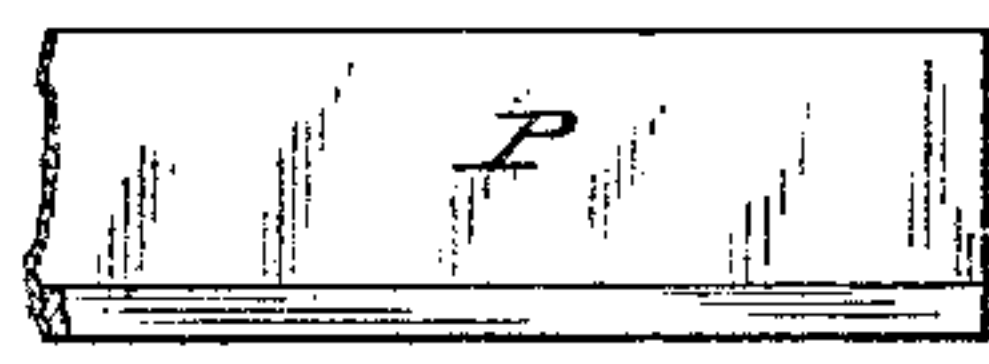


Fig. 7.



Fig. 6.



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Inventor,
Andrew Hunter

(No Model.)

2 Sheets—Sheet 2.

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Fig. 8

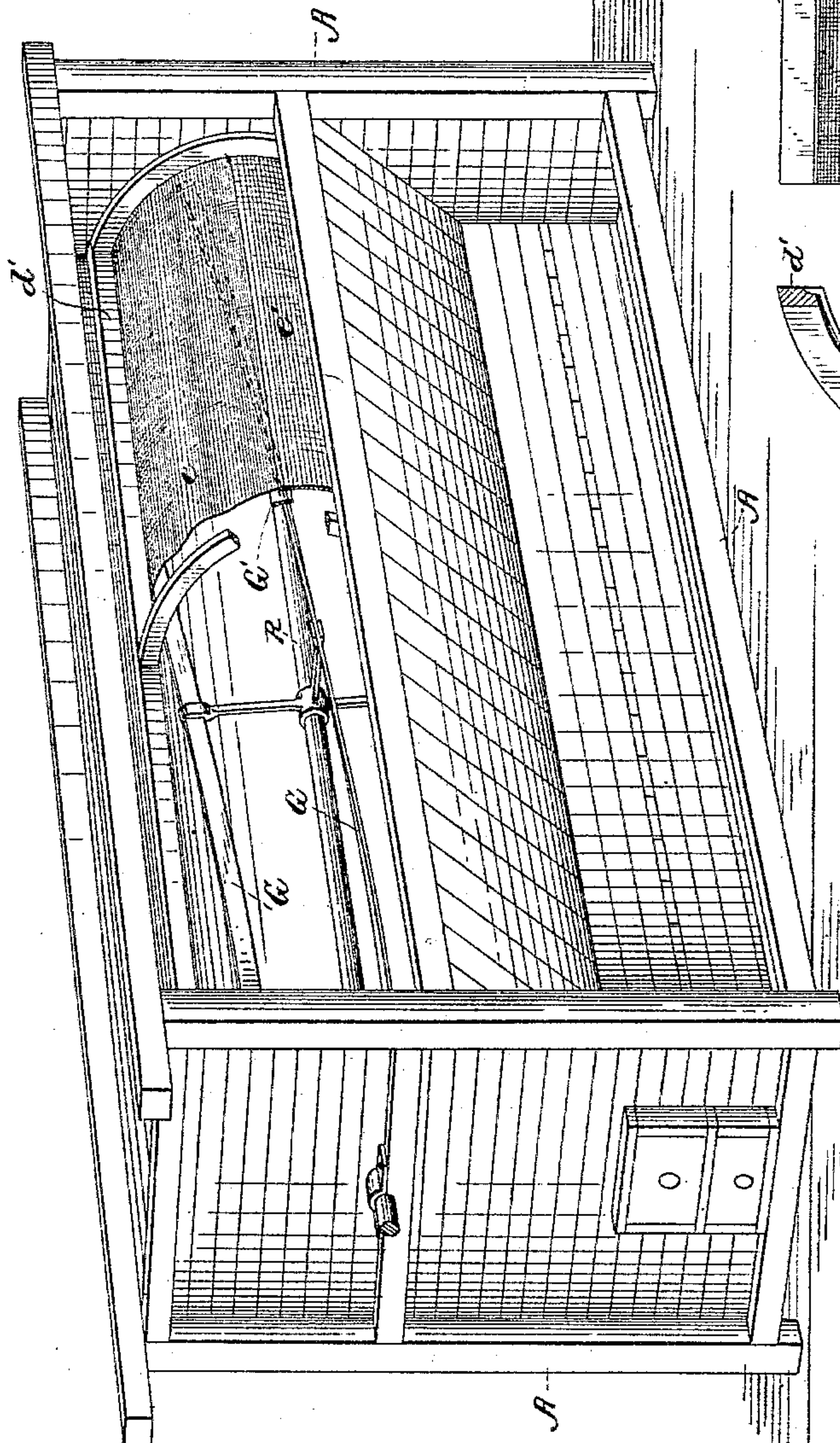


Fig. 9

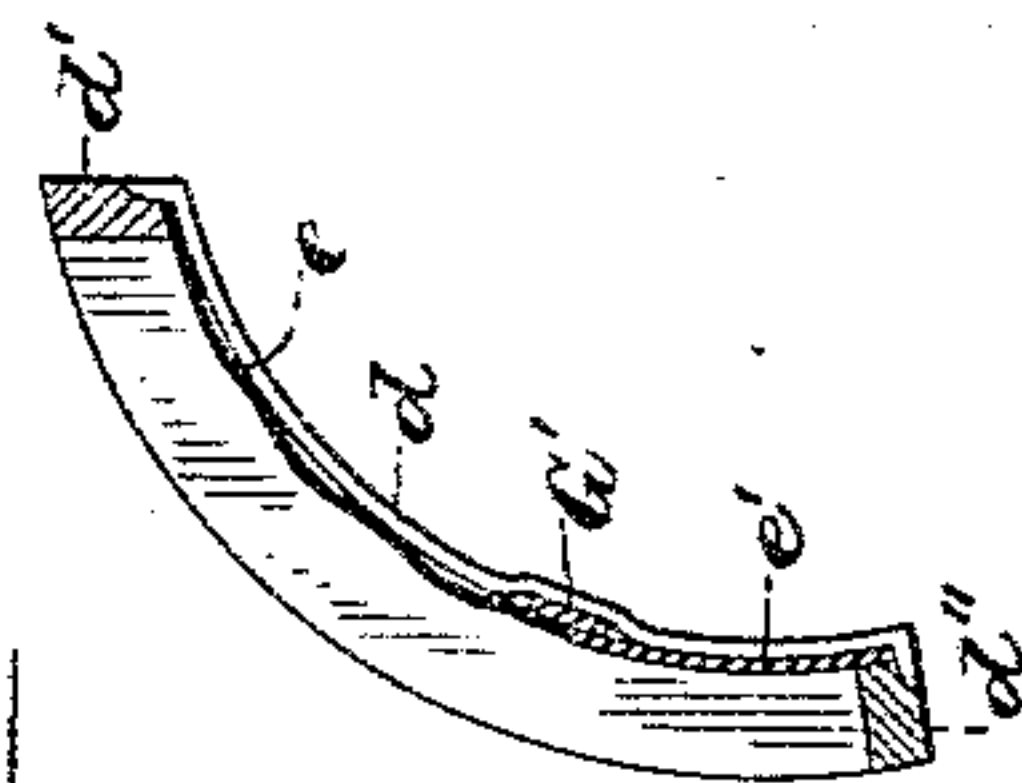
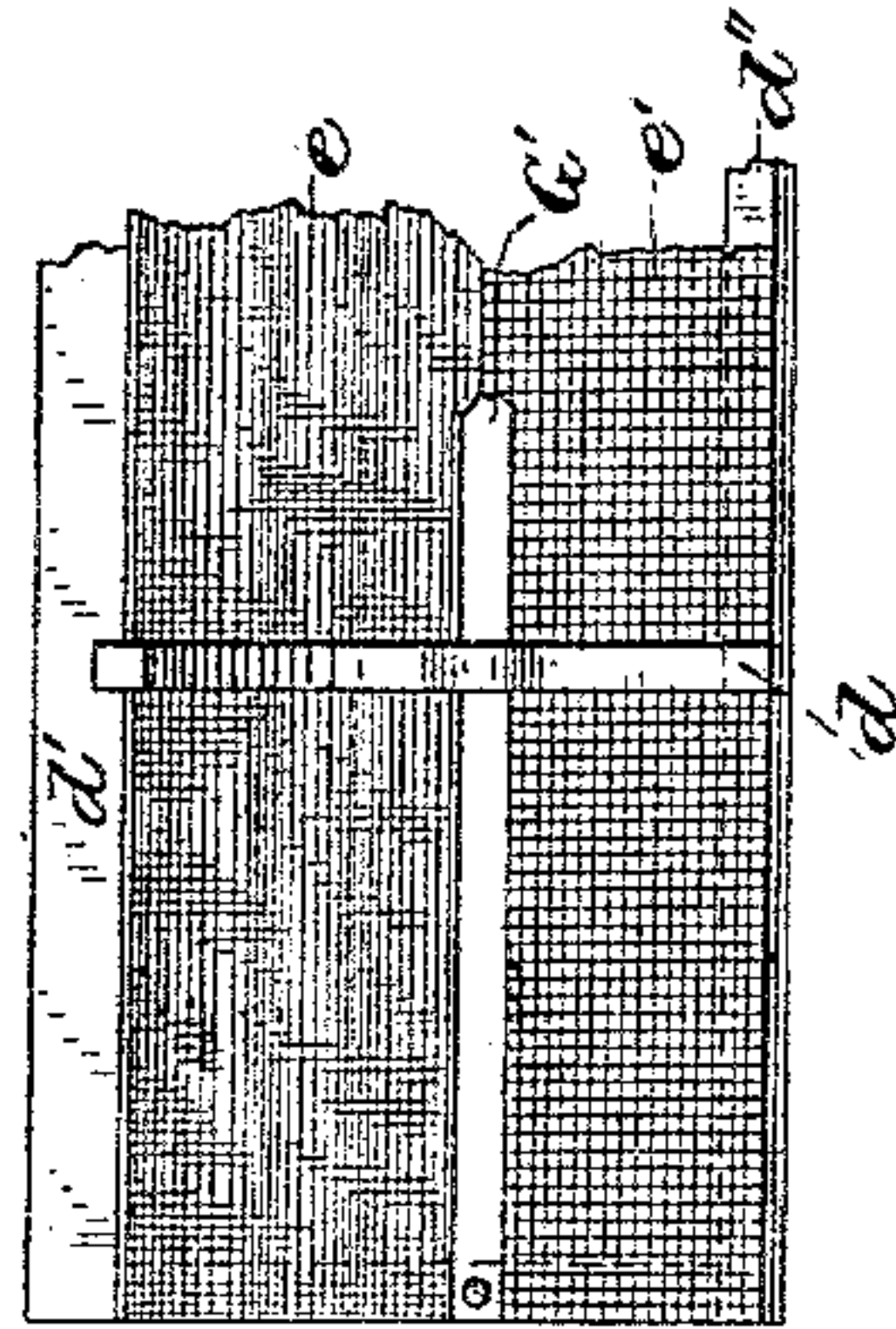


Fig. 10

Witnesses.

Henry Faust
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UNITED STATES PATENT OFFICE.

ANDREW HUNTER, OF CHICAGO, ILLINOIS.

FLOUR-DRESSING MACHINE.

SPECIFICATION forming part of Letters Patent No. 300,371, dated June 17, 1884.

Application filed January 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, ANDREW HUNTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Flour-Dressing Machine, of which the following is a specification.

My invention relates to improvements in flour-dressing machines in which the meal is fed into the cylinder through an opening in the top of the machine, and is caught by rotating beaters and thrown by centrifugal force against the silk bolting-cloth which covers a part of the cylinder-frame; and the object of my improvements are, first, to feed the meal or chop into the cylinder through the top in a thin sheet, thereby reducing the wear on the silk; secondly, to produce a more perfect mode of attaching the silk to the segmental ribs of the cylindrical frame; and, thirdly, to secure an easy discharge of the tailings out of the machine, which, in connection with the graduated feed, reduces the power and friction on the wearing parts of the machine. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical central section of a flour-dressing machine embodying my invention. Fig. 2 is a vertical cross-section in the plane of the line *x x* of Fig. 1. Fig. 3 is a like representation in the plane of the line *f f* of Fig. 1. Fig. 4 is a section of a beater, showing the angular end. Fig. 5 is a top view of a section of the reciprocating bar and vertical side cams. Fig. 6 is a top view of a section of the slide-valve. Fig. 7 is a view of the end of one of the beaters, showing the rounded or convex face. Fig. 8 is a longitudinal perspective view showing the spiral beaters, frame *y*, and loose silk *e*. Fig. 9 shows a section of frame *y* covered with loose silk, and canvas, and cross-strip *G'*. Fig. 10 shows a cross-section of frame *y*.

Like letters of reference indicate like parts. A represents the frame of the machine, which is adapted to receive the working or operative parts suitably.

B B' are receiving-hoppers, into which the meal is fed.

C C' is a screw-conveyer placed horizontally

on top of the machine, and carrying from the center toward the ends. The shaft F is provided with right and left hand flights. The top of the conveyer is provided with a close cover, into which holes N N are bored for permitting the air to escape that enters with the meal, also that which escapes from the interior of the cylinder through opening D. The bottom of the conveyer is constructed with a longitudinal aperture for the meal to pass through. At one side of the opening is placed a reciprocating bar, O, with projecting pins *l l* in one side, extending over the aperture. The other side is provided with a sliding valve or cut-off for distributing evenly the meal that enters the machine. One end of shaft F is provided with a sprocket-wheel, the other end with a vertical cam, U, which works in the projections on casting V, which is fastened on the end of bar O.

m is a chamber having a hopper-shaped bottom, and I is a stationary hollow cylinder located in the chamber *m*. The cylinder I consists of annular or segmental ribs *c* and *d*, attached to cross-bars *d d*, and secured to the walls of the chamber *m*. The segmental ribs *c* are made of wood and the ribs *d* of metal. The spaces between the ribs *c c* and *d d*, I close with silk bolting-cloth *e* and canvas, and the lower section, *n*, with wood.

R is a rotary shaft passing centrally through the cylinder I, and G' G' are arms extending radially from said shaft.

G G are horizontal bars or helical beaters, attached to the arms G' G'. The beaters G G are set spirally. The ends of one or more are bent.

L is a passage or eduction leading from the cylinder I through opening H, and located near the bottom of the cylinder.

G' is a transverse strip placed on the lifting side of the cylinder, and fastened at the ends on the inside of the annular or segmental ribs *c*, and resting between the canvas and ribs *d*.

K K' is a conveyer placed below the chamber *m*. The conveyer is constructed with right and left hand flights for carrying the flour from the center to the ends of the machine. The bottom of the conveyer is provided with slides *x x*, and at the ends with slides *w w* for the flour to escape.

S is a partition which divides the machine into two separate parts, virtually making two machines in one.

7 7 are sectional frames, which form the stationary cylinder. The faces of the beaters G G are made convex, and the opposite or rear sides flat, as shown in Fig. 7. The object is to lift the meal from off the bottom and distribute it evenly against the bolting-cloth by scattering it in divergent lines.

The operation of the parts now described are as follows: Two grades of meal or flour are fed, if desired, into the machine—one grade into hopper B and the other into hopper B'. The meal, as it falls onto the conveyer, is carried toward the ends of the machine. Each grade is treated in the same manner as if operated upon in two separate machines. The meal enters the machine through the longitudinal opening in the bottom of the conveyer. The action of the vibrating bar O and pins 11 causes the meal to enter freely, which otherwise would clog. The slide-valve P, when moved out or in, regulates the distance the meal is carried by the conveyer toward the tail end. It is only necessary to have the meal enter the cylinder about three-fourths of the distance from the center of the machine, leaving one-fourth of the silk on the cylinder for cleaning the tailings, before they are discharged at the tail ends through openings H H. The meal, as it enters the cylinder through longitudinal openings D, falls in a thin sheet, and is caught by the beaters G G and thrown against the silk which covers the cylindrical frames on the downward side, thereby separating a large portion of the flour before the meal reaches the bottom of the cylinder. What falls onto the bottom is raised by the revolving beaters and thrown against the silk on the rising side. The meal continues to be operated upon by the beaters until the flour is all removed and the residue carried to the tail end by the spirality of the beaters. One or more of the ends of the beaters are bent at an angle of about fifty degrees, which forces the tailings out through openings H H as fast as they are carried to the tail end by the spirality of the beaters. The openings H H are located near the bottom of the cylinder in a line described by the circuit of the ends of the beaters. The meal, when raised from off the bottom of the cylinder I, is thrown with the greatest force against the covering of the cylinder up to a point below the central line of the shaft R, on the lifting side of the beaters. Therefore it is necessary to cover that part of the cylinder with canvas or heavy material. At a point below the line of contact of the silk and canvas I use a piece of strap-iron, G', crosswise, for the purpose of breaking the force of the meal as it is raised by the beaters. In order to secure the greatest durability of the silk, it is necessary to put it on the frames loose. This is accomplished by tacking the sides of the silk to the cross-pieces d d and to the cir-

cular pieces c c. The center of the silk on the frames is held in position by placing the circular strap-iron d d against the inner side of the silk, and afterward securing the ends to cross-pieces d d. The iron circles prevent the silk from coming in contact with the beaters, and by that means the silk is put onto the frames perfectly loose and elastic, which does away with the rotary traveling of the meal around the inner surface of the silk. The meal, as it is thrown against the elastic or loose silk, rebounds, and is again caught by the beaters and thrown back against the silk. The rebounding of the meal vibrates the silk sufficiently, which prevents it from clogging and doubles the capacity of the machine. It also makes the silk more durable.

The disadvantages of the ordinary centrifugals are as follows: The meal is fed in at the head near the center of the cylinder. As it reaches the bottom the rapidly-revolving beaters lift it up and throw it with centrifugal force against the silk. At the head the full quantity of feed must be raised and carried around the cylinder. As the meal approaches the tail end the flour has been separated; consequently the wear is less on the silk at that point, but must be great at the head, where all the feed enters. The meal, as it is thrown against the silk by the beaters, follows their direction, often causing the meal to travel circuitously between the silk and the outer circuit of the beaters, which causes the silk to wear rapidly and reduces the bolting capacity. The meal having been exposed so long to the action of the beaters and the circuitous friction against the silk, the fractured particles of coarse flour are further reduced, causing the flour product of the reel to be soft and pasty.

In order to produce a round granular flour from a centrifugal reel, it must be separated as soon as it enters the reel, which can only be accomplished by feeding lengthwise from on top through an aperture which connects with the inside of the cylinder. As the meal drops, the rapidly-revolving beaters throw it with centrifugal force against the bolting-cloth. The faces of the beaters, being convex, distribute the meal more evenly over a greater surface of the bolting-cloth and separate a large portion of the flour before it reaches the bottom of the machine. Beaters which have a straight or square face throw off on the lifting side at a given point, and the same on the down side, thereby causing an immense wear at the points described, which is obviated by the face of the beaters being circular. The cylindrical frames, if covered loosely with bolting-cloth, prevent the circuitous traveling of the meal and double the bolting capacity, while the wear on the silk is much reduced, as well as the amount of power required.

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

1. The combination, in a flour-dressing machine, of the sliding valve P, vertical cam U, reciprocating bar O, pins l, and projections V, fastened to the bar O, for the cam U to work in, substantially as described.

2. The combination, in a flour-dressing machine, of the conveyers C C', sliding valve P, vertical cam U, reciprocating bar O, pins l, and projections V, fastened to the bar O, for the cam U to work in, substantially as described.

3. In a flour-dressing machine, the combination of hoppers B B', conveyers C C', air-discharge openings N N, center partition, S, beaters G G, and cylinder I, with discharge-openings H H at the end, substantially as described.

4. In a flour-dressing machine, the combination of a longitudinal feed device, stationary bolting-cylinder I, having a longitudinal feed-opening in the top and discharge-opening H, and rotary beaters G, having bent ends, substantially as described.

5. In a flour-dressing machine, the combination of rotary shaft R, radial arms G' G'', and lifting convex beaters G G, substantially as described.

6. In a flour-dressing machine, the combination of rotary shaft R, radial arms G' G'', and lifting convex beaters G G, with their rear sides flat, substantially as described.

7. In a flour-dressing machine, frames y y, clothed with loose unstretched bolting-cloth e, in combination with rotary beaters G G, substantially as described.

8. In a flour-dressing machine, the combination of frames y y, clothed with loose unstretched cloth e, and ribs d d, with rotary beaters G G, substantially as described.

ANDREW HUNTER.

Witnesses:

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ERNST KUEHNE.