

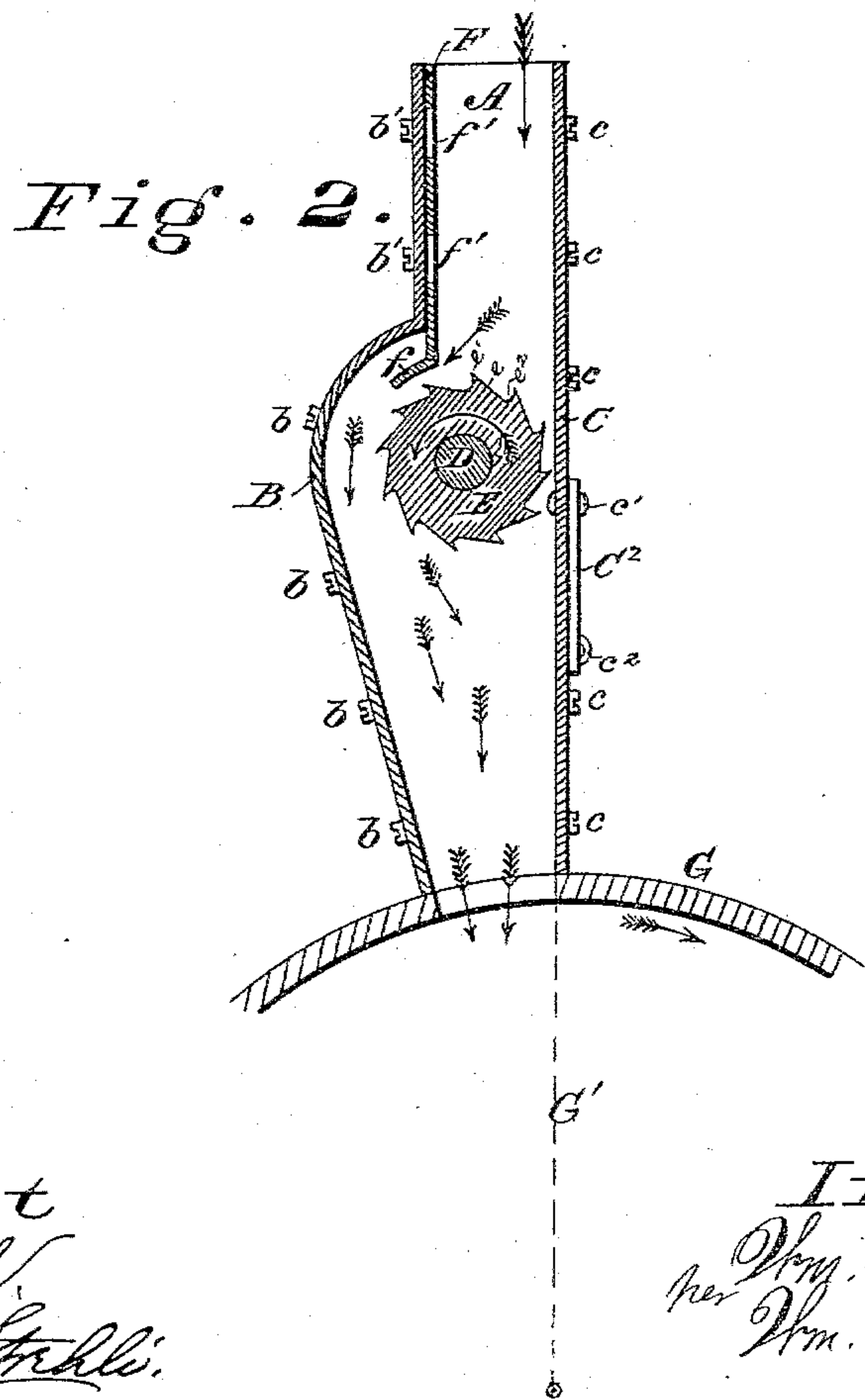
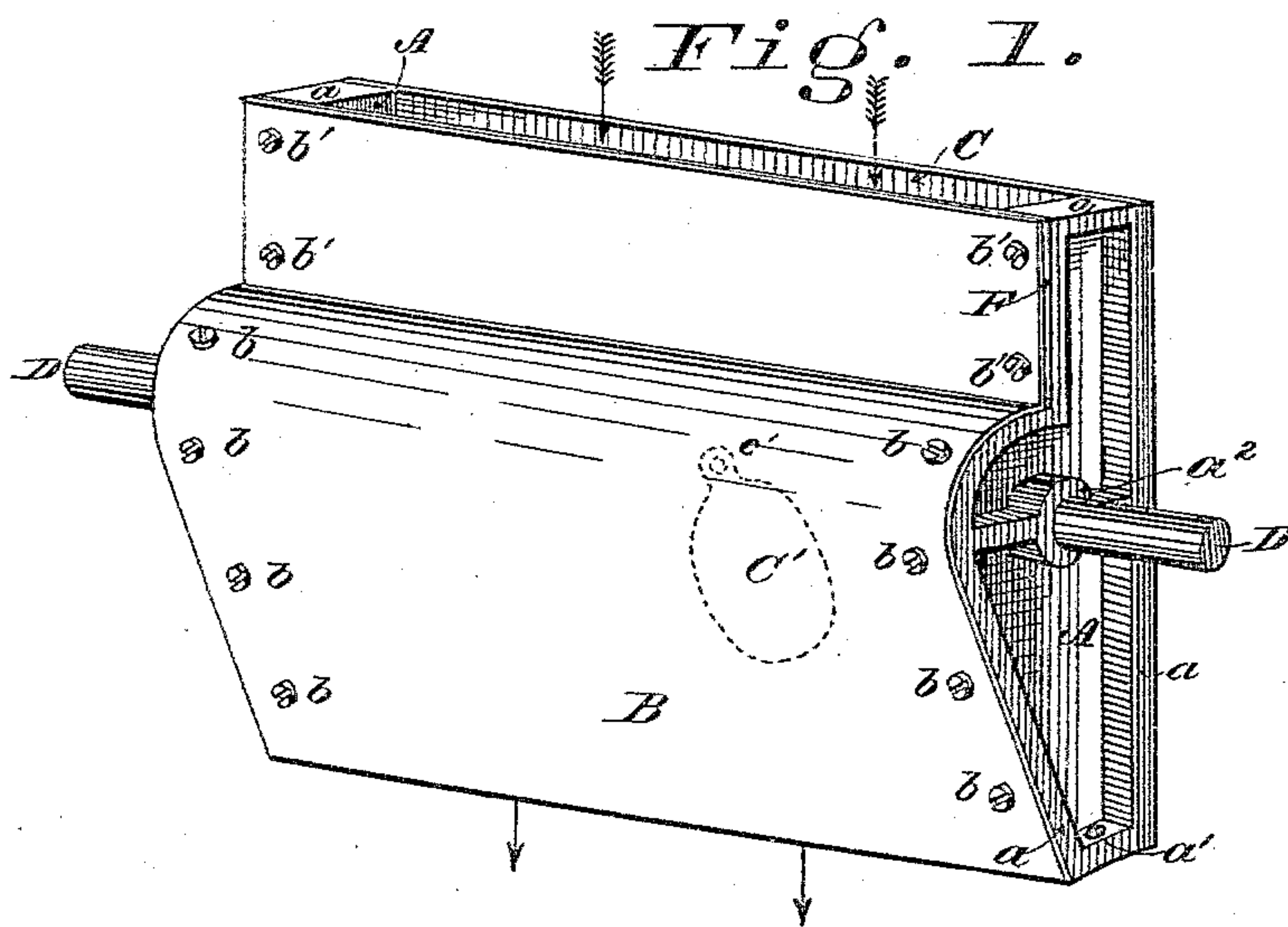
(No Model.)

W. R. FEE.

HOPPER.

No. 356,581.

Patented Jan. 25, 1887.



Attest  
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# UNITED STATES PATENT OFFICE.

WILLIAM R. FEE, OF CINCINNATI, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO THE NATIONAL COTTON SEED OIL AND HULLER COMPANY, OF  
MEMPHIS, TENNESSEE.

## HOPPER.

SPECIFICATION forming part of Letters Patent No. 356,581, dated January 25, 1887.

Application filed February 17, 1881. Serial No. 26,403. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM R. FEE, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain  
5 new and useful Improvements in Hoppers, of which the following is a specification.

My invention relates to that class of hoppers in which the body or box is stationary, the work to be accomplished and the means of  
10 regulating the same being controlled by an internal mechanism.

The objects of my improvements are to provide a simple and substantial construction, with operating parts easily adjustable and of  
15 such a character as not to be liable to get out of order, and in addition thereto to provide a positive feed, easily regulated, and with feeding mechanism so constructed as not in any way to injure the material or cause it to clog,  
20 either while passing through the same or while being delivered into the receptacle with which the hopper may be connected.

Figure 1 is an exterior perspective view of a hopper embodying my invention, showing  
25 in dotted lines a hand-hole with cover, located at the rear of the hopper. Fig. 2 is a vertical cross-section of the same, shown attached to the shell of a cylinder for containing any form of cutting, hulling, grinding, or cleansing  
30 mechanism.

In this description similar letters refer to similar parts shown in the drawings.

The body or box of the hopper is composed of the ends A A, preferably of cast-iron, and  
35 the sides B C, preferably of sheet metal. The side B is fastened to the ends by the screws marked *b* and those marked *b'*, the side C being fastened by the screws marked *c*, only part of which are shown in the drawings. The ends  
40 are each cast with a flange, *a a*, around the edges, as shown in the drawings, which flange is made heavier at the bottom, and bored, as shown at *a'*, for the reception of a suitable bolt for securing the hopper to any desired recep-  
45 tacle. This flange also extends horizontally across the face of the end a little above the center, enlarging about midway between the sides into the annular boss or lug *a''*. This boss or lug *a''* on each end is bored of sufficient

size to admit of the shaft D turning smoothly 50 in the same. This shaft D extends horizontally through the hopper from end to end, and has firmly keyed to it the feed-roller E, and is made sufficiently long to project far enough beyond one or both of the ends for the attach- 55 ment of a pulley, gear-wheel, or other driving device.

The feed-roller E is constructed with any preferred number of corrugations, *e e e*, which, in section, are preferably of the general shape 60 shown in Fig. 2, and which extend the entire length of the roller, the points *e' e' e'* of the corrugations pointing, like saw-teeth, in the direction of the revolution of the roller, which direction is indicated in the drawings by the 65 semicircular arrow shown on end of roller in Fig. 2. The throats *e'' e'' e''* of the saw-tooth corrugations *e e e* are curved in section, the rear side or back of the points or teeth being nearly, if not quite, flat, thus giving them 70 the form fully shown in Fig. 2. The feed-roller E is placed about midway between the top and bottom of the hopper, the hopper being made of sufficient height to give room enough above the roller to confine the mate- 75 rial in its course and give also a uniform supply to the feeding mechanism. Sufficient space is also provided between the roller and the bottom of the hopper, whereby all danger of clogging of the material in its exit from the 80 hopper is obviated.

The top or opening of the hopper is narrower than the diameter of the feed-roller E, and is placed, as shown in Fig. 2, so that the seed which enters the hopper will for the most 85 part fall on the roller at one side of its vertical longitudinal axis. In this way the depressions in front of the points *e'* become filled with seed, which have then to be lifted and carried around under the flange *f* of the slide 90 F, and this space between the flange and the feed-roller cannot therefore be choked by the pressure of the seed in the hopper above the feed-roller. The side B of the hopper is bulged out, as shown, opposite the feed-roller, to in- 95 crease the dimensions of the hopper at this point to accommodate it to the size of the roller.

The slide or gate F, for regulating the quan-



tity of the material passed by the roller, is made preferably of sheet metal, and extends the full length of the hopper, from end to end, and extends between the ends A A and side B, and runs from the top of the hopper downwardly to near the roller. This slide F is provided on its lower edge with a curved lip, *f*, which, however, extends only between the inner faces of the ends A A. This lip is circular in form, and preferably of an arc of a circle, having the same center as the roller E, and described with a radius sufficiently large to enable it to "clear" the teeth of the roller. This lip is at least wide enough to cover the space between two adjacent points or teeth *e'* of the roller E, in order to effectually regulate the flow of seed or grain between the roller E and the lip *f*. The location of the slide F and lip *f* being near a vertical plane passing through the axis of the roller E, enables the slide and lip to more readily push back and prevent any undue amount of grain or seed from being crowded between the roller and lip. This slide F has slots *f' f'* at each end where it rests against the ends A A. These slots are made of sufficient length to permit of the slide being moved the full distance of the vertical opening between the roller E and side B; the slots are also of sufficient width to allow the screws *b' b'* to pass through from the side B into the ends A A.

The side C has an opening, *C'*, which may be made of any preferred shape and size, situated a little below the roller E, and which is covered by a swinging door, *C''*, pivoted in any approved manner to the side C at *c'*, and provided at its opposite side with a suitable handle and catch, *c''*, for raising or fastening it.

In the operation of this hopper the material is introduced into the top by means of a spout, chute, or any preferred means, and falling by gravitation it is caught by the corrugations of the roller E, which is rotated by the motion imparted by means of the shaft D and connections and thrown forcibly downward toward the vent in the bottom of the hopper. The roller E, fitting closely against the side C, and the direction of the teeth or corrugations, as well as of the revolution of said roller E, being in the opposite direction, as shown by the semicircular arrow, Fig. 2, the material is all forced toward the side B, the quantity fed through being regulated by the distance between the roller E and the lip *f* of the slide F. The distance between the lip *f* and the roller E, and consequently the amount of material that may be passed in a given time, is regulated by loosening the screws *b' b'* and raising or lowering the slide F, the

screws being again tightened when the desired adjustment is effected. This is my preferred means for regulating the feed.

The points *e'* of the corrugations, together with the centrifugal force imparted by the revolution of the roller E, serve to thoroughly separate and disentangle the material, so that being delivered out of the hopper in a loose free state, it is better fitted for any further manipulations. This operation also prevents any clogging or choking up of the vent of the hopper.

In case of any foreign matter or refuse becoming lodged in the interior, it is easily removed by opening the door or cover *C''* and inserting the hand or any suitable instrument.

All the material dropped through the vent of the hopper that is not immediately taken up by the operating part of the grinding, crushing, hulling, or cleansing mechanism nearest it falls back in a direction opposite to the revolution of said mechanism, and is subsequently taken up thereby.

What I claim as new and of my invention, and desire to secure by Letters Patent, is—

1. The herein-described hopper provided with feed-roller E, having serrations *e*, and adjustable gate F, having flange *f*, one side of the hopper having a straight vertical side, C, close to the side of the feed-roller E, the other side, B, of said hopper above the roller being nearly over the axis of the latter, and part of the roller being contained in the recess of the side B, the gate F being at side B and its flange *f* extending into the recess of side B and over the upper part of the roller which is in the said recess, substantially as and for the purposes specified.

2. The herein-described hopper provided with feed-roller E, having serrations *e*, and adjustable gate F, having flange *f*, one side of the hopper having a straight vertical side, C, close to the side of the feed-roller E, the side B of the hopper above roller being nearly over the axis of the latter, and part of the roller being contained in the recess of the side B, the gate F being adjusted against side B and having flange *f*, extending into the recess of side B and over the upper part of the roller which is in the said recess, the gate F being provided with vertical slots *f'*, and adjustably secured by means of said slots and bolts *b'* to side B of the feed-hopper, substantially as and for the purposes set forth.

WM. R. FEE.

Attest:

G. C. WILSON,  
E. R. HILL.