

(No Model.)

R. D. GATES.
PULVERIZING MACHINE.

No. 287,658.

Patented Oct. 30, 1883.

Fig 2.

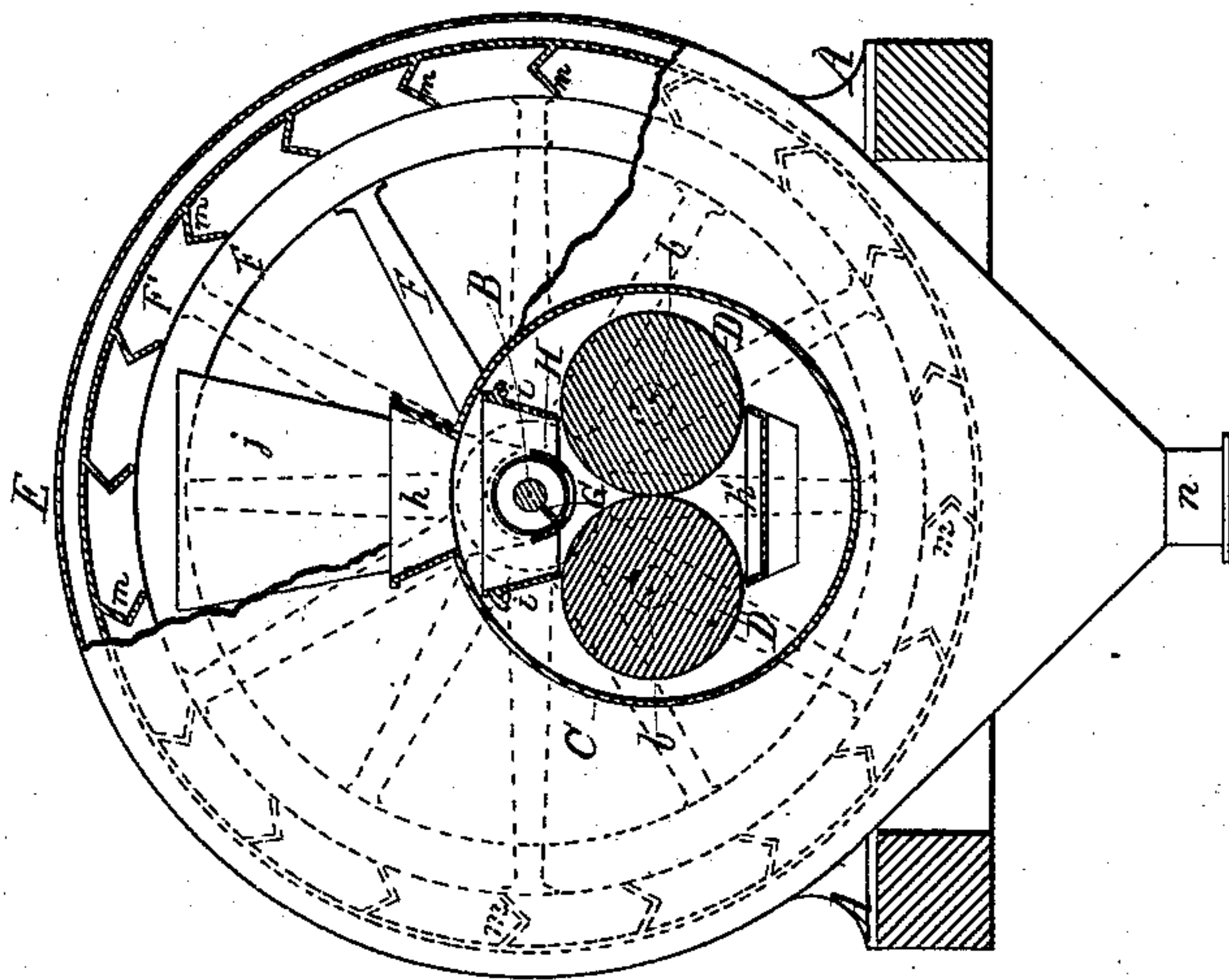
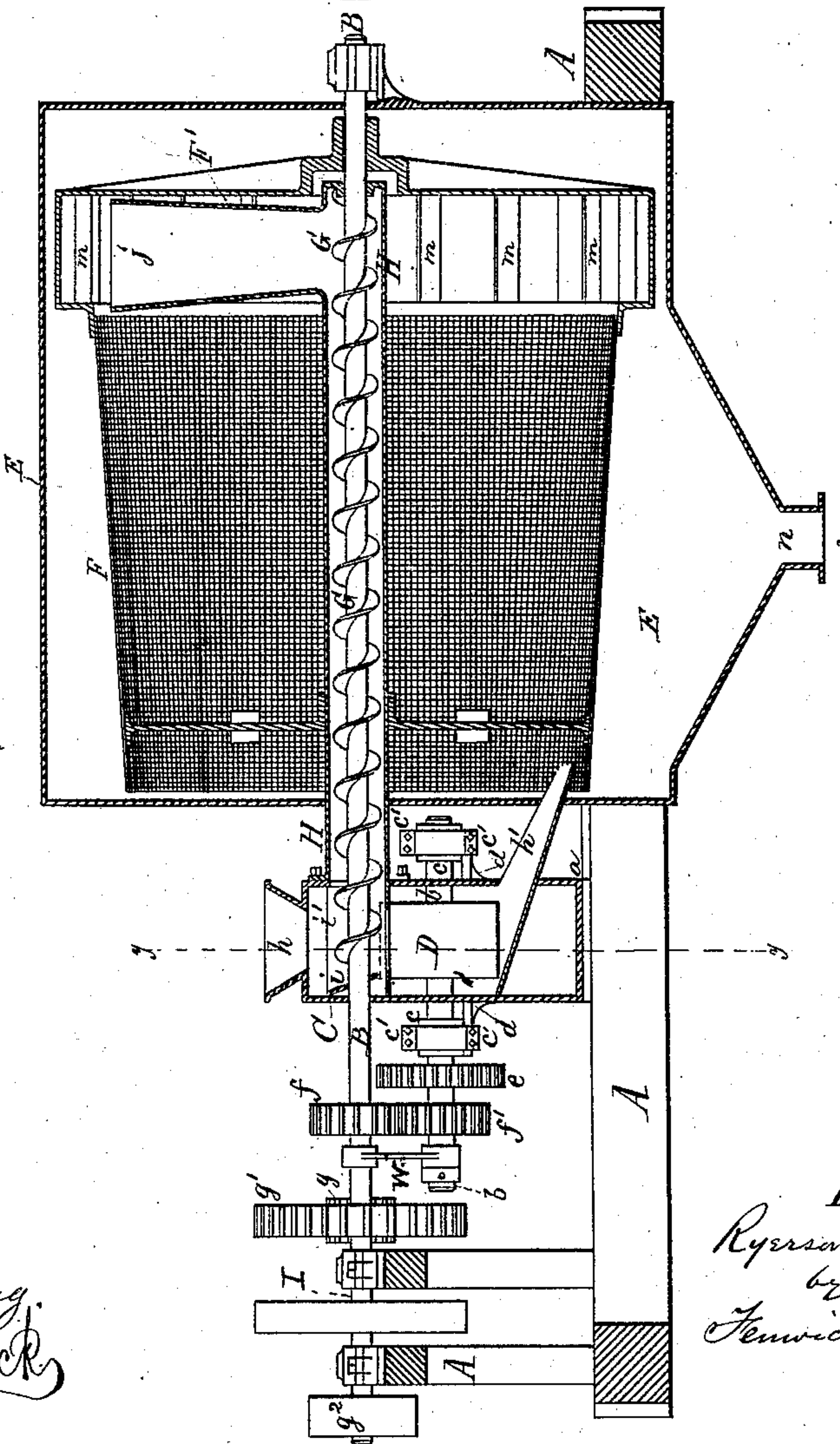


Fig 1.



Witnesses:
J. P. Theodore Lang.
Robt L. Fenwick

Inventor:
Ryerson D. Gates
by his attys
Fenwick & Lawrence

UNITED STATES PATENT OFFICE.

RYERSON D. GATES, OF CHICAGO, ILLINOIS.

PULVERIZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 287,658, dated October 30, 1883.

Application filed April 11, 1883. (No model.)

To all whom it may concern:

Be it known that I, RYERSON D. GATES, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Pulverizing-Machines, of which the following is a specification.

My invention relates to an improved construction and arrangement of the pulverizer for which Letters Patent No. 260,092, dated June 27, 1882, were granted to me, and the nature of the same will be fully understood from the following description, claims, and accompanying drawings, in which latter—

Figure 1 is a vertical longitudinal section of my improved machine, and Fig. 2 is a vertical section and broken view of the same. The section is taken in the line *yy* of Fig. 1, a portion of the end of the screen-case being broken out and a portion of the elevator shown in cross-section.

A in the accompanying drawings represents a frame for supporting a central revolving shaft, B; a case, C, in which a pair of pulverizing-rollers, D D, are placed; a case, E, in which a tapering circular screen, F, with elevator F' attached, is placed; a return feed screw, G; a return conducting-spout, H, and gearing for operating the rollers, return feed screw, screen, and elevator.

The roller-case C may be properly fastened to the frame by means of suitable flanges provided on its stand or base *a*, and in like manner the screen and elevator-case E may be fastened in position upon the frame.

In the pulverizer-case C the pair of pulverizing-rollers D D are hung by means of shafts *b*, which are supported in ordinary bearings, *c*, of yokes *c' c'*, which are supported in the ordinary manner by side brackets, *d d*, of the case C. The brackets *d d* are cast on the sides of the case, and upon these brackets the yokes *c c* are arranged and caused to slide by ordinary adjusting-screws and adjuncts, substantially as shown in my aforesaid patent, or substantially as shown in my pending application for a patent for a pulverizing-machine filed on April 4, 1883. In each of these yokes two ordinary journal-bearings are placed, one of each pair being made adjustable with the yoke, and one of each pair stationary with the case C, so that the distance at which the roll-

ers stand apart may be regulated as occasion requires. The shafts *b b* of the rollers pass through the journal-bearings on each side of the case C, and the shaft which is fitted to the stationary journal-bearings is made of a greater length on one side of the case C than the shaft which is fitted to the adjustable journal-bearings, in order that it may be passed through a spider, W, said spider being suspended upon the revolving central shaft B in such a manner that the said shaft can revolve within the opening in the spider, through which it loosely passes, without carrying the spider with it. The shorter shaft *b* is so terminated on the same side of the case C as to not reach the spider, and it can thus move with its journal-bearing whenever the bearing is adjusted with the roller. These rollers are geared together by toothed wheels—such as *e*—on shafts *b*, and are revolved together by gear-wheels *f f'*, wheel *f* being on shaft B and wheel *f'* on one of the roller-shafts. Motion is imparted to the said central shaft B by gear-wheels *g g'* and a pulley, *g²*, wheel *g* and pulley *g²* being on a shaft, I, and wheel *g'* on shaft B; or motion may be imparted directly to the shaft B by a pulley, which may be applied directly on it, the shaft B being extended for this purpose. The said case C is provided with a hopper-opening, *h*, and also with an inclined discharge-chute, *h'*, the latter passing through the head of screen-chamber E and extending into the revolving screen F, as shown.

On the central shaft B the return feed screw G is constructed, and this screw occupies a place in the case C between inclined guiding and guarding plates *i i'*, constituting a three-sided secondary feed-hopper, extends through the screen F, and terminates at the end of the elevator F', as shown.

The conducting-spout H is angular or L-shaped, and its receiving end *j* stands vertical with respect to its horizontal portion, and being thus shaped, arranged, and permanently fixed upon the stationary screen-case, it serves for receiving and conducting back to the rollers D D the imperfectly-pulverized substances which pass from the inside of the screen into the elevator F'. The said elevator F', with the screen F united to it, is keyed fast upon one end of the shaft B, and said shaft is supported in bearings of the frame

A and case E, as shown, and the elevator F' is provided with V-shaped buckets *m* on its inner periphery, and these buckets take and carry up the substances to a position directly over the portion *j* of the return conducting-spout H. The screen is made flaring in a rearward direction, and the finely-pulverized substances pass over the wire-gauze of the screen and are discharged through its meshes into the screen-case, to be removed through the funnel-like passage *n*, while the partially-pulverized substances move backward on the inclined surface of the said wire-gauze and pass into the elevator, to be carried up and dropped into the vertical portion *j* of the conductor-spout H.

It will be seen that the screw, by revolving with the shaft B and screen, causes the imperfectly-pulverized substances which descend upon it through portion *j* of conductor H to pass back into the case C, then between the rollers and into the screen F, through the meshes of which it passes into the screen-case as finely-pulverized product to be discharged through passage *n*.

If desired, the case C may be provided with more than one pair of rollers D D, as illustrated in my application for a patent filed in the United States Patent Office on the 4th day of April, 1883, in which construction the return feed screw would occupy a place in case C either between two pairs of pulverizing-rollers, or above two, three, or more pairs, just as found most convenient.

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

1. The combination, with the central revolving shaft and its gearing, of the flared revolving screen F, having an elevator, F', on its flared end, the stationary conducting-spout H *j*, return feed screw G, pulverizing-rollers, and their gearing, substantially as and for the purpose described.

2. The combination, with the central revolving shaft and its gearing, of the screening and elevating devices, their case, the return feed-

ing mechanism, pulverizing-rollers, their case, and the gearing of the rollers, substantially as and for the purpose described.

3. The combination of the case C, pulverizing rollers D D, the case E, combined screen and elevator F F', means for forming communication between the screen F and the case C, shaft B, return screw feeder G, conductor-spout H *j*, and suitable gearing for operating the pulverizing-rollers, screw feeder, and combined screen and elevator, substantially as and for the purpose described.

4. The combination, with the screw feeder G H, case C, and rollers D D, of the hopper *h* and secondary hopper *i i'*, substantially as and for the purpose described.

5. The combination of the conducting-spout H *j*, its portion H running horizontally and its portion *j* vertically, with the combined pulverizing and screening machine, substantially as described.

6. The combination of the backwardly-flared screen F, having elevator F' formed on its rear flared end, with the central shaft, a pulverizer, a return feed mechanism, and gearing of the shaft and pulverizer, substantially as and for the purpose described.

7. A screen, F, and elevator F', combined with the shaft B, screw feeder G H, pulverizing-rollers D, and suitable gear-wheels, substantially as and for the purpose described.

8. The pulverizing-case C, having chute *h'*, and the rollers D D, in combination with the case E, inclined revolving screen F, and elevator F', shaft B, and gearing of the rollers and the shaft, substantially as and for the purpose described.

9. A backwardly-flared revolving screen, F, having an elevator, F', on its rear flared end, with the stationary L-shaped conducting-tube H *j*, and the return feed screw G, substantially as and for the purpose described.

RYERSON D. GATES.

Witnesses:

E. O. HASTEN,
HARRY LAIRD.