

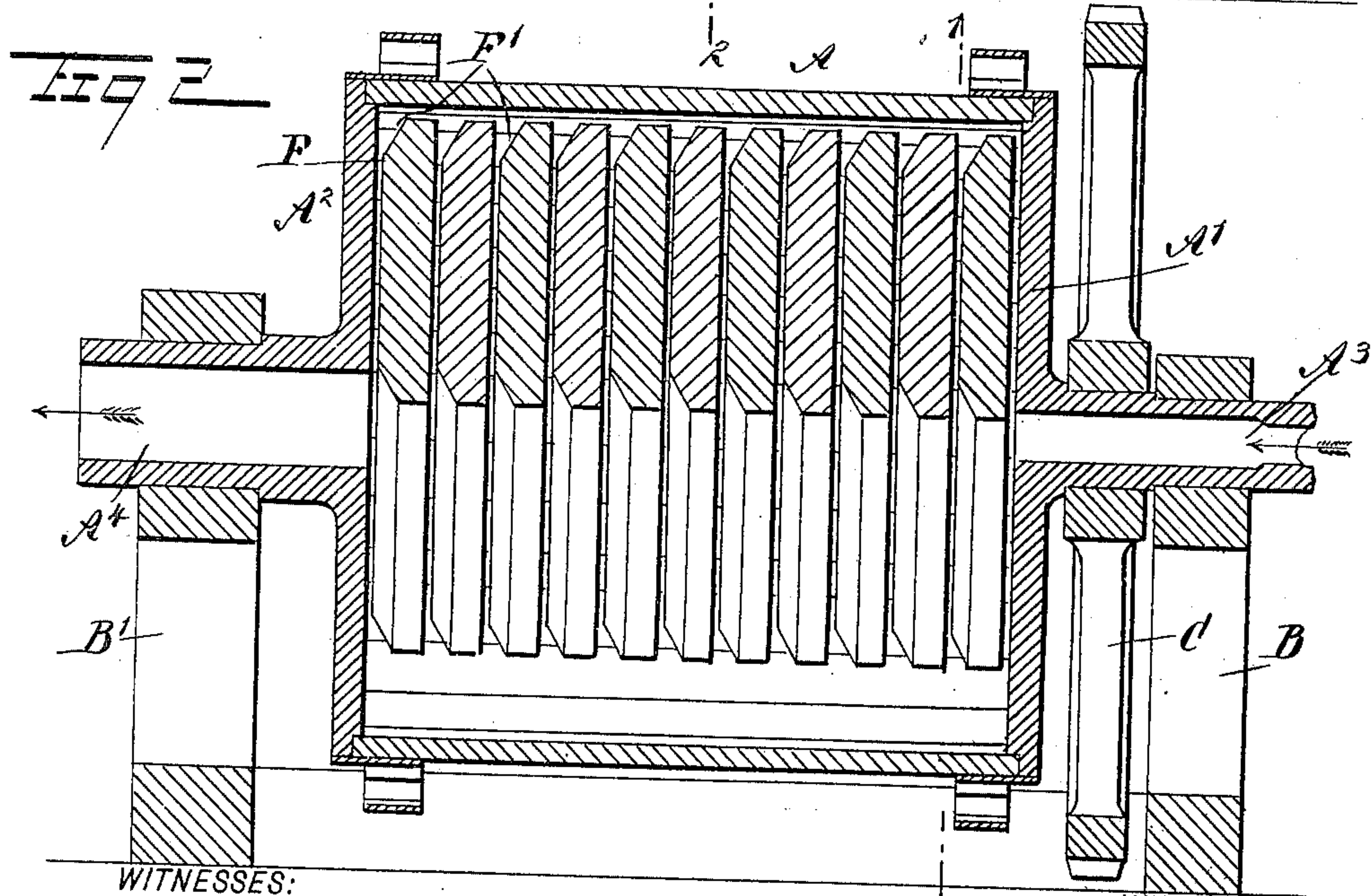
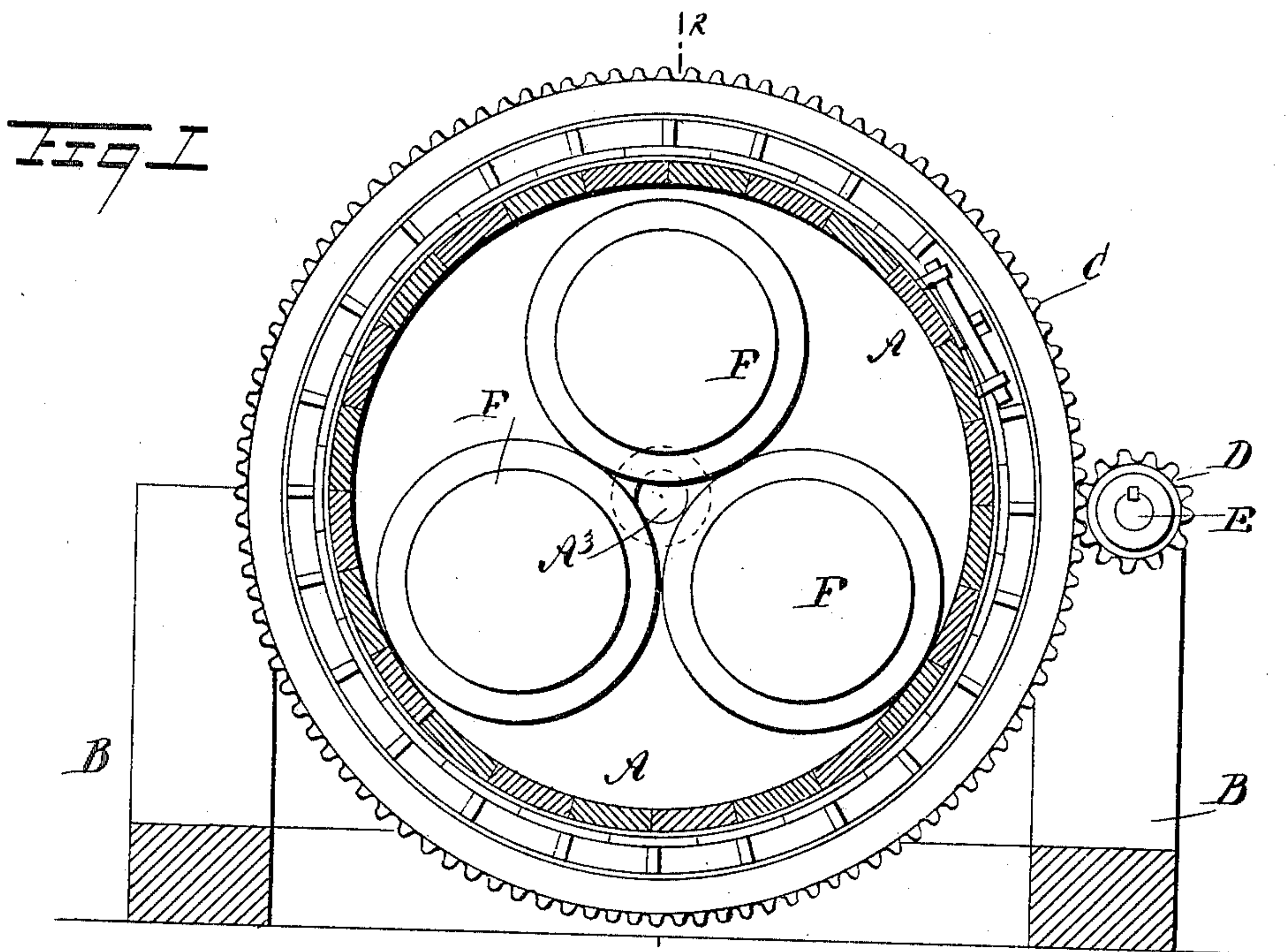
No. 630,125.

Patented Aug. 1, 1899.

J. H. STEELE.
PULVERIZER.

(Application filed Feb. 10, 1898.)

(No Model.)



WITNESSES:

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UNITED STATES PATENT OFFICE.

JAMES H. STEELE, OF BUTTE, MONTANA.

PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 630,125, dated August 1, 1899.

Application filed February 10, 1898. Serial No. 669,781. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. STEELE, of Butte, in the county of Silver Bow and State of Montana, have invented a new and Improved Pulverizer, of which the following is a full, clear, and exact description.

The invention relates to apparatus for pulverizing ore and other substances; and its object is to provide a new and improved pulverizer which is simple and durable in construction and arranged to reduce the material to a very fine state at a comparatively low running expense.

The invention consists of novel features and parts and combinations of the same, as will be described hereinafter and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is a cross-section of the improvement on the line 1 1 of Fig. 2, and Fig. 2 is a longitudinal sectional elevation of the same on the line 2 2 of Fig. 1.

The improved apparatus is provided with a drum A, having heads A¹ A², formed with hollow trunnions A³ A⁴, journaled in suitable bearings carried by standards B B'. The hollow trunnion A³ serves as an inlet for the material to the drum, and the ground material is discharged through the other hollow trunnion A⁴, which thus forms an outlet for the drum.

On one of the trunnions (the trunnion A³, as shown) is secured a gear-wheel C in mesh with a pinion D, attached to a shaft E, connected by a pulley and belt or other means with suitable machinery for imparting a rotary motion to the said shaft E, which, by the pinion D and gear-wheel C, imparts a very slow rotary motion to the drum A. The latter is filled with sets of crushing-rollers F, preferably in the shape of solid disks, each set containing three rollers arranged in such a manner that they are in peripheral contact with each other and also with the inner surface of the drum A at the time two of the rollers are in a lowermost position, as indicated in Fig. 1, the periphery of the third roller then being but a short distance from the inner surface of the drum. The triangu-

lar spaces between the disks of the several sets of disks are in longitudinal alinement with each other, and the disks are of such diameter that the said spaces are in longitudinal alinement with the inlet and outlet openings of the drum to permit the material to be fed into the said spaces, where the bulk of the crushing takes place. Each of the rollers F has its rearward face formed near the outer end with an annular bevel F', so that the material in the triangular space between the one set of rollers will be fed to the space between the next adjacent set, thereby insuring a feeding of the material from the inlet to the discharge end of the drum.

Now it is evident that when the drum A is rotated, as above described, and material is fed into said drum, as mentioned, then the material comes in contact successively with the sets of rollers contained in the drum, the material being subjected to a crushing action between the rollers and the drum as the rollers are rotated by the rotary motion given to the drum and rolls off on the inner surface of the drum. It will further be seen that the material in its movement from the entrance end to the discharge end passes between the adjacent surfaces of the sets of rollers, and thus is also subjected to a crushing action in addition to the crushing action at the peripheral surfaces of the rollers and drums.

In running the apparatus the speed of the drum is principally governed by the nature of the material under treatment—that is, a fast rotary motion can be given to the drum when treating soft material and a slower rotary motion when pulverizing hard ore.

When the apparatus is in action, the coarser material is acted upon more particularly by the peripheral surfaces of the rollers and the inner surface of the drum, while the finer particles receive a rubbing action between the faces of adjacent sets of rollers, as previously mentioned. It will also be seen that the lowermost rollers always receive the weight of the uppermost rollers to give additional crushing power to the lowermost rollers.

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

1. A pulverizer, comprising a revoluble drum provided with inlet and outlet open-

ings at opposite ends, and sets of plain disk-like crushing-rollers in the drum, each set consisting of three rollers in peripheral contact with each other, and the sets of rollers
5 being arranged side by side throughout the length of the drum with the two lowermost rollers of each set in contact with the drum, the spaces between the rollers of the several sets being in longitudinal alinement with
10 each other and into which spaces the material is fed from said inlet-opening, substantially as described.

2. A pulverizer, comprising a revoluble drum having inlet and outlet openings at opposite ends at the center thereof, and sets of
15 plain disk-like crushing-rollers in the drum, each set consisting of three rollers in peripheral contact with each other, the sets of rollers being arranged side by side throughout
20 the length of the drum, with the two lower rollers in contact with the drum, the spaces

between the rollers of the several sets being in longitudinal alinement with each other and with the inlet and outlet openings of the drum, substantially as described. 25

3. A pulverizer, comprising a revoluble drum having inlet and outlet openings at opposite ends at the center thereof, and sets of plain solid disk-like crushing-rollers arranged side by side in the drum throughout the length
30 of the same, each set consisting of three disks in peripheral contact with each other, each disk having one peripheral edge cut away to form an annular beveled surface, the beveled surfaces being on correspondingsides
35 of the several disks, substantially as herein shown and described.

JAMES H. STEELE.

Witnesses:

FRED HOLBROOK,
HENRY SWANSON.