

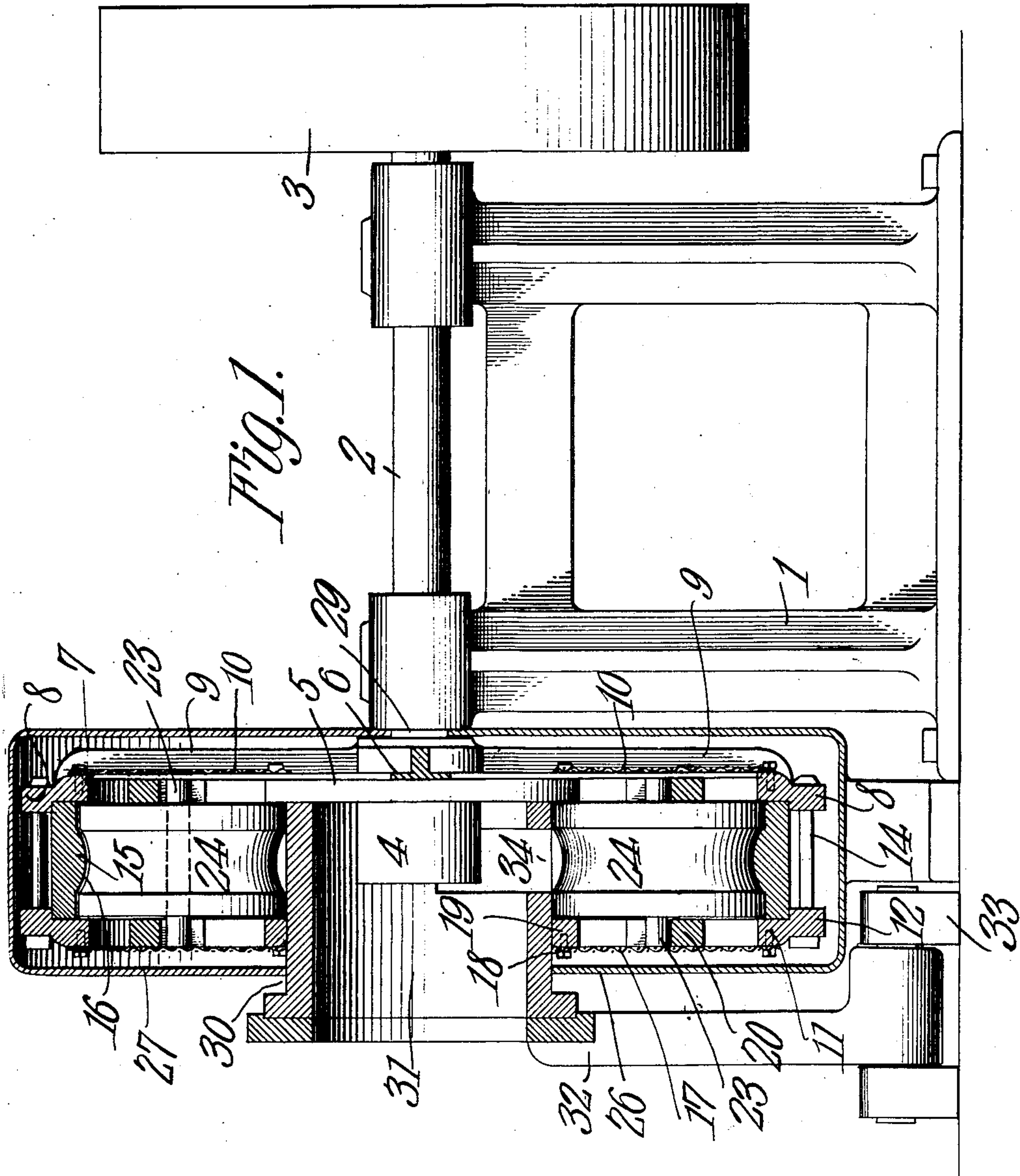
No. 896,954.

PATENTED AUG. 25, 1908.

F. W. THOMSON.
MACHINE FOR PULVERIZING ORE.

APPLICATION FILED OCT. 2, 1907.

2 SHEETS—SHEET 1.



Witnesses

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Robert D. Lawson

Frederick W. Thomson. Inventor

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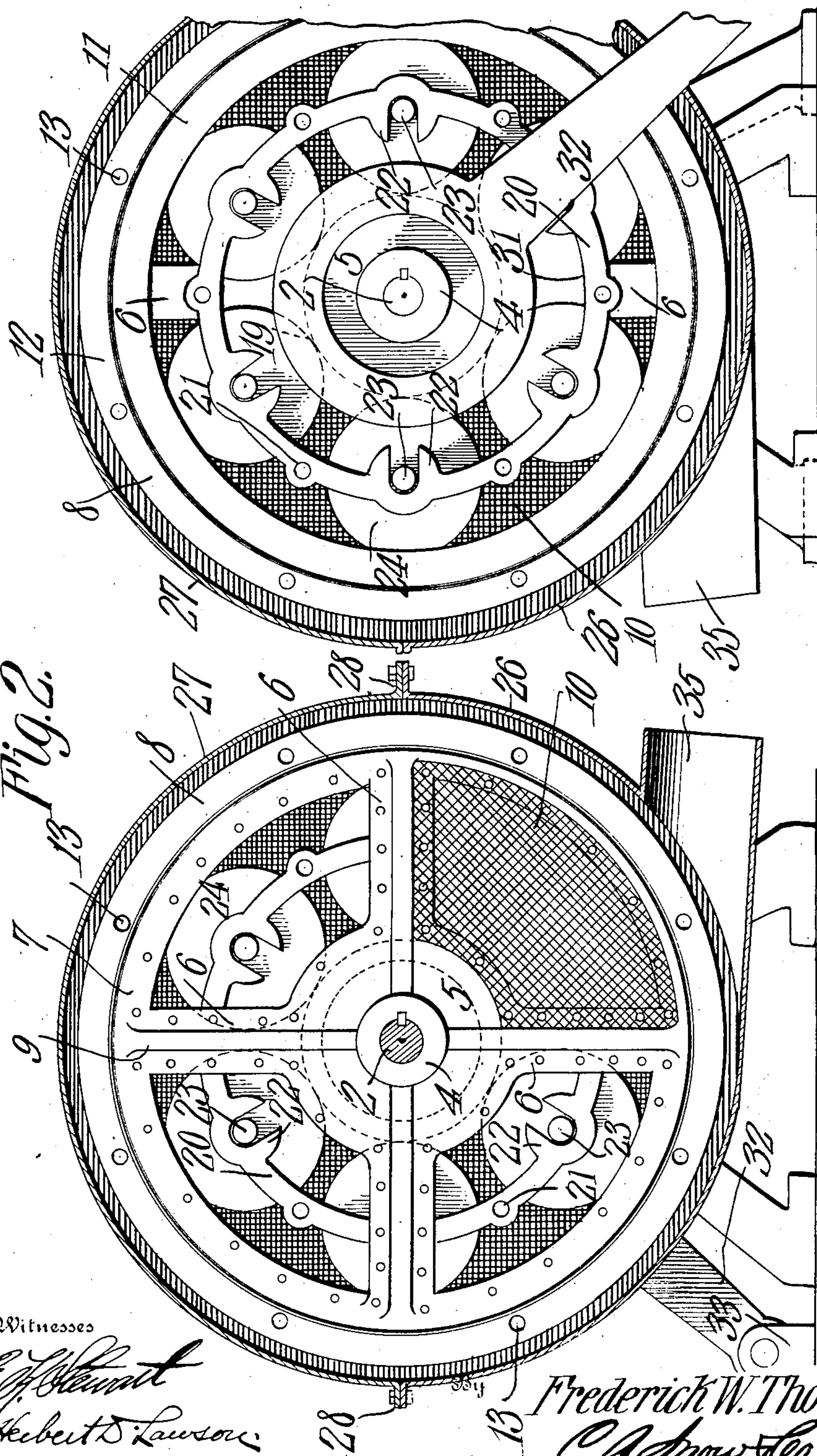


Fig. 2.

Fig. 3.

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UNITED STATES PATENT OFFICE.

FREDERICK WILLIAM THOMSON, OF FORT WILLIAM, ONTARIO, CANADA.

MACHINE FOR PULVERIZING ORE.

No. 896,954.

Specification of Letters Patent.

Patented Aug. 25, 1908.

Application filed October 2, 1907. Serial No. 395,590.

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM THOMSON, a subject of the King of England, residing at Fort William, in the Province of Ontario and Dominion of Canada, have invented a new and useful Machine for Pulverizing Ore, of which the following is a specification.

This invention relates to machines for pulverizing ore and its object is to provide a structure of this character having a novel arrangement of grinding or crushing rolls, operating to crush the ore upon a circular die plate cooperating therewith.

A still further object is to provide simple means whereby the pulverized material may be readily collected and discharged, the entire device being so formed as to produce practically no dust within the surrounding atmosphere.

A further object is to provide novel means whereby the material to be pulverized can be readily fed between the rolls while the machine is in operation.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a transverse section through the pulverizing mechanism. Fig. 2 is a section taken transversely through the shaft of the machine close to the adjoining head of the machine, all but one of the screens being removed from the head. Fig. 3 is an elevation of the feed end of the machine, the hood being shown in section and the adjoining screen entirely removed.

Referring to the figures by characters of reference, 1 designates a supporting frame on which is journaled a drive shaft 2 carrying a pulley 3 at one end while its other end has a hub 4 keyed or otherwise fastened to it. Formed upon the hub 4 is an annular flange 5 from which radiate integral spokes 6 which are formed with a ring 7. An annular flange 8 is formed with the ring and said ring with its spokes and hub 4 constitutes one of the heads of the grinding mechanism. Ribs 9 are disposed longitudinally upon the outer faces of the spokes 6 and radiate from the hub 4. Sectoral recesses are thus formed between the ribs and the spaces between the spokes are designed to be closed by screens

10 bolted or otherwise fastened within the recesses and to the spokes, flange 5 and ring 7. Only one of these screens has been shown in position in Fig. 2 but it is of course to be understood that a screen is to be interposed between every two adjoining ribs. A ring 11 is arranged opposite ring 7 and has an annular flange 12 similar to flange 8. Both of these flanges 8 and 12 have openings 13 designed to receive bolts 14 whereby the two rings may be clamped upon opposite edges of a die ring 15. The flanges 8 and 12 are preferably offset from the rings 7 and 11 so as to partly lap the die ring and hold it properly centered as indicated in Fig. 1. The die ring 15 may be of any preferred cross sectional contour but, as shown in the drawings, it is preferably formed with a central interior annular rib 16 convex in cross section. Ring 11 is not provided with spokes but, instead, has an annular screen 17 fastened to it, there being a circular opening 18 at the center of the screen and secured to the screen and around this opening is a reinforcing ring 19. Ring 11, screen 17, and ring 19 constitute the other head of the apparatus.

Disposed within and concentric with each ring 7 and 11 is a supporting ring 20. The two rings are fastened together by means of ribs 21 or other suitable fastening devices and each ring has a plurality of inwardly extending ears 22 arranged in pairs and constitute guides for the trunnions 23 of rolls 24. The peripheries of these rolls are shaped so as to conform with the contour of the die ring 15.

Mounted at one side of the frame 1 is a hood comprising a lower section 26 and an upper section 27, both sections being provided at their meeting edges with flanges 28 designed to be bolted or otherwise fastened together. The hood is of sufficient size to completely inclose the two heads of the grinding mechanism and has an opening 29 in one wall to receive shaft 2, while a large opening 30 is formed in the opposite wall of the hood for the reception of a feed cylinder 31. This cylinder projects through the ring 19 and between the rolls 24 and abuts against the flange 5 of hub 4. An arm 32 is rigid with the cylinder and extends downward and is pivotally connected to brackets 33 secured to the floor or other structure upon which the machine is mounted. An opening 34 is formed in the bottom portion of the cylinder 31 and directly above

the lower rolls 24 and constitutes an outlet for material supplied to the cylinder.

In using the machine herein described the shaft 2 is set in motion and will cause the rapid rotation of the two rings 7 and 11 and the die ring 15, whereas the cylinder 31 will remain practically stationary. By mounting the cylinder in the manner described, however, it is free to accommodate itself to any oscillation of the parts rotating with the shaft. While the machine is in operation the ore to be pulverized is supplied to cylinder 31 in any suitable manner and discharged through opening 34 between the rolls 24. The rolls will engage the stationary cylinder 31 and will be rotated around their own axes. The rolls coact with the die ring 15 and will act upon the ore to thoroughly pulverize it. When the ore has been reduced to a desired grade of fineness it will be thrown outward through the screens and into the hood from which it will be discharged through an outlet spout 35 provided at the bottom of the hood.

I claim:—

1. In an ore pulverizer the combination with oppositely disposed screen heads and a die ring detachably mounted and clamped between the heads, one of said heads having a central opening; of a tubular feed device projecting through the opening and bearing against the opposite head, said device having an outlet opening, driving means connected to one of the heads, a pivoted support for the feed device, and a plurality of connected crushing rolls movable around the feed device and upon the die ring, said rolls being disposed to travel longitudinally of the outlet in the feed device.

2. In an ore pulverizer the combination

with a screen head having a central opening, a tubular feed device extending through the opening and having an outlet, and a pivoted support for said feed device; of a drive shaft, a screen head secured thereto and bearing against the inner end of the feed device, a die ring clamped between the heads and concentric with the feed device, supporting rings loosely mounted between and adjacent the inner faces of the screen heads, and crushing rolls engaging said rings and held against lateral movement thereby, said rolls being interposed between and bearing upon the die ring and the feed device.

3. In an ore pulverizer the combination with a screen head having a central opening, a tubular feed device projecting through the opening and having an outlet, and a pivoted support for said device; of a drive shaft, a screen head secured to one end portion thereof and bearing against the feed device, a die ring clamped between the screen heads and concentric with the feed device, supporting rings loosely interposed between the screen heads, crushing rolls interposed between and engaging the supporting rings and held against lateral movement thereby, said rolls bearing upon the feed device and die ring, and a sectional head inclosing and spaced from the screen heads and die ring, said head having an opening through which the feed device projects.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FREDERICK WILLIAM THOMSON.

Witnesses:

JOHN McCLUBE,
ROBERT SWANSON.