

(No Model.)

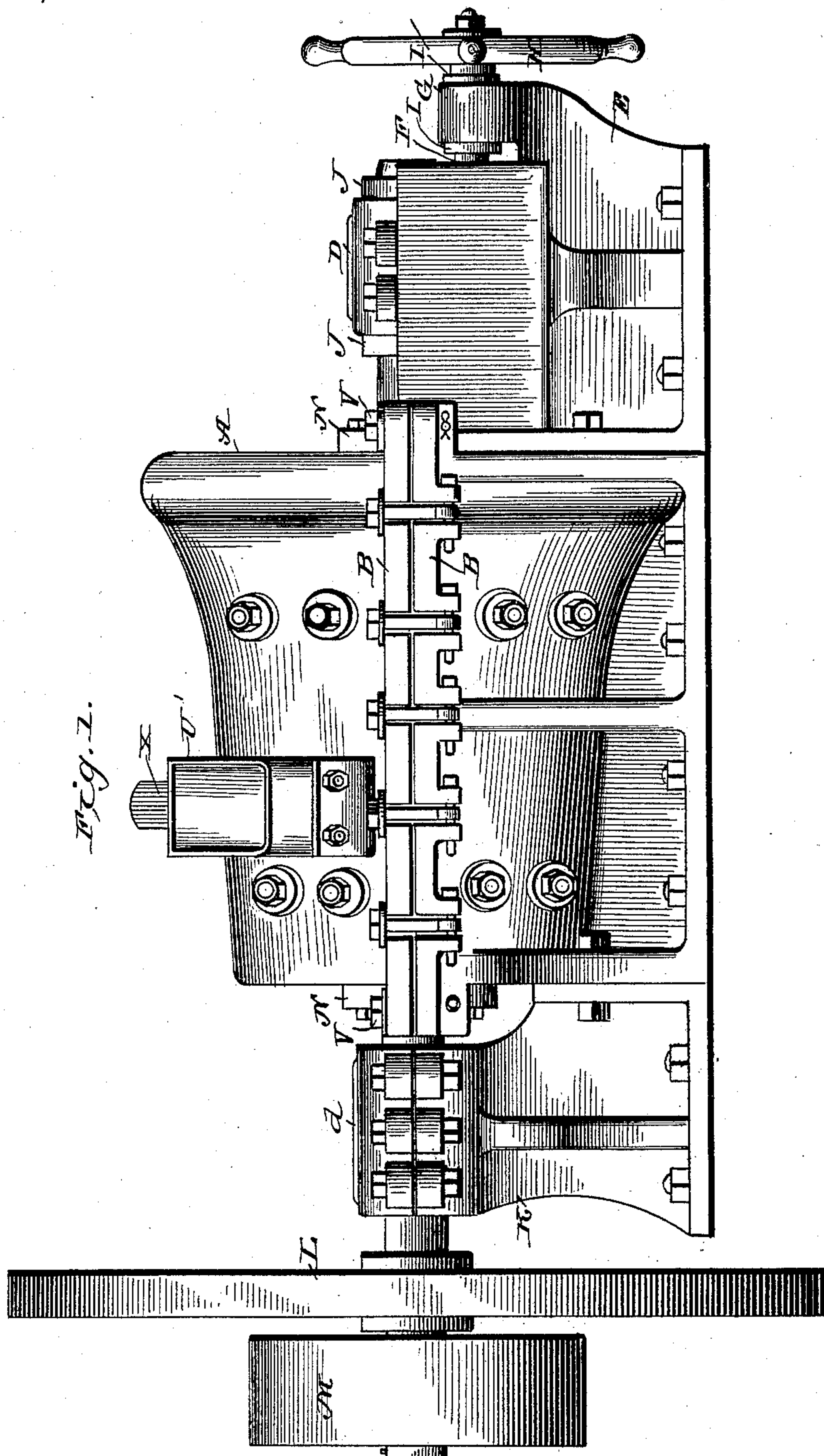
4 Sheets—Sheet 1.

F. B. & A. H. MEECH.

STONE AND ORE CRUSHING AND PULVERIZING MACHINE.

No. 385,638.

Patented July 3, 1888.



WITNESSES,

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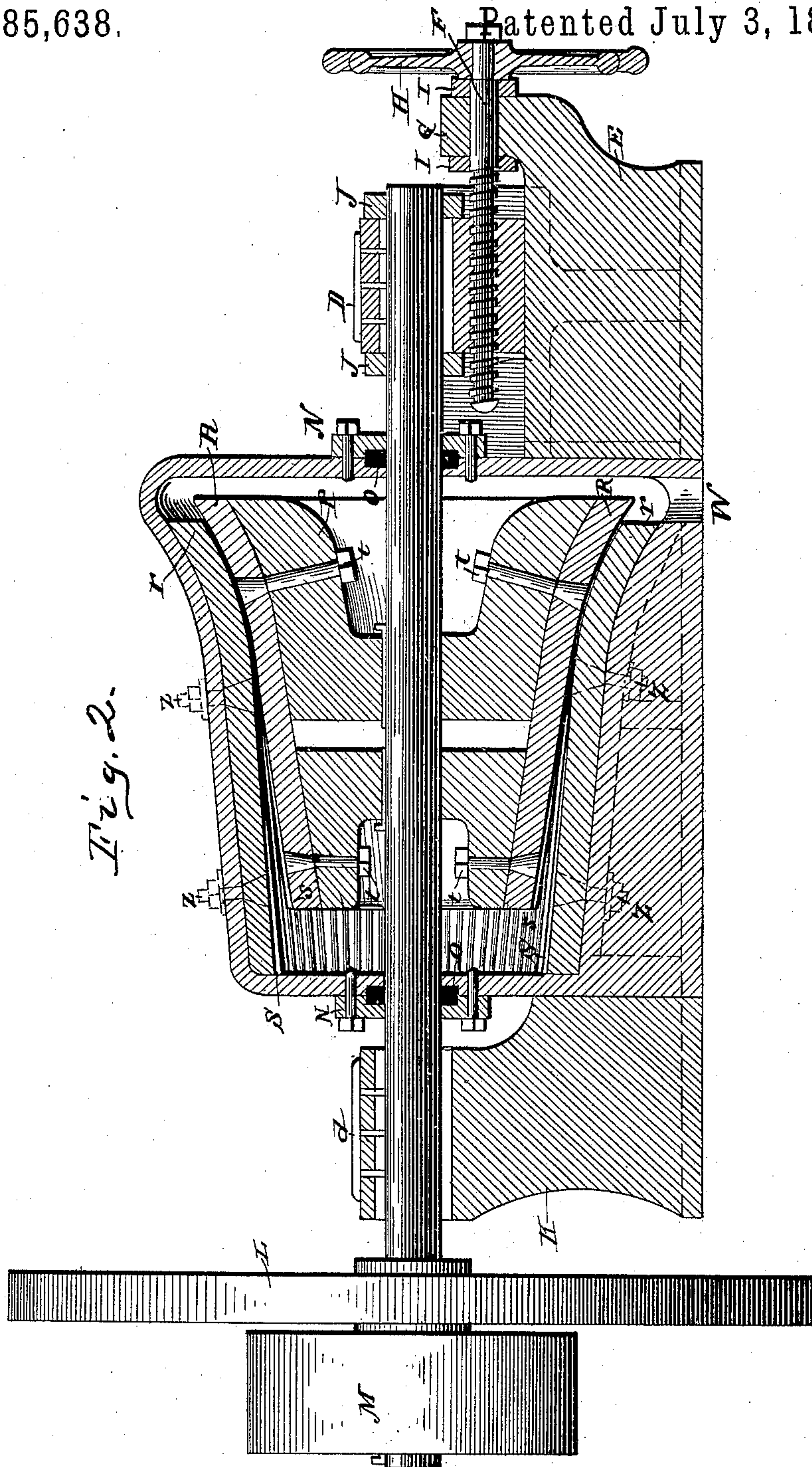
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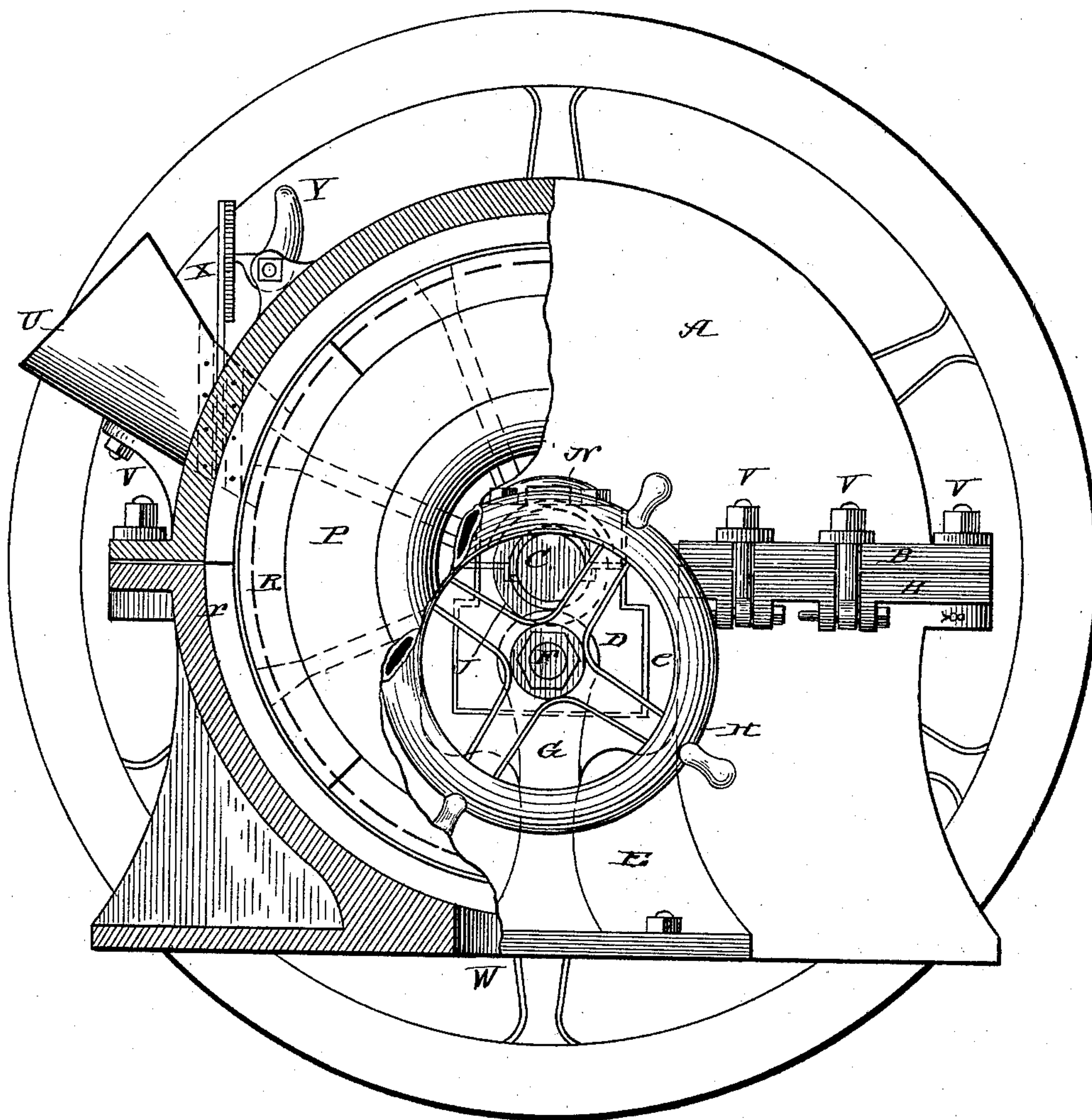
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Fig. 3.



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4 Sheets—Sheet 4.

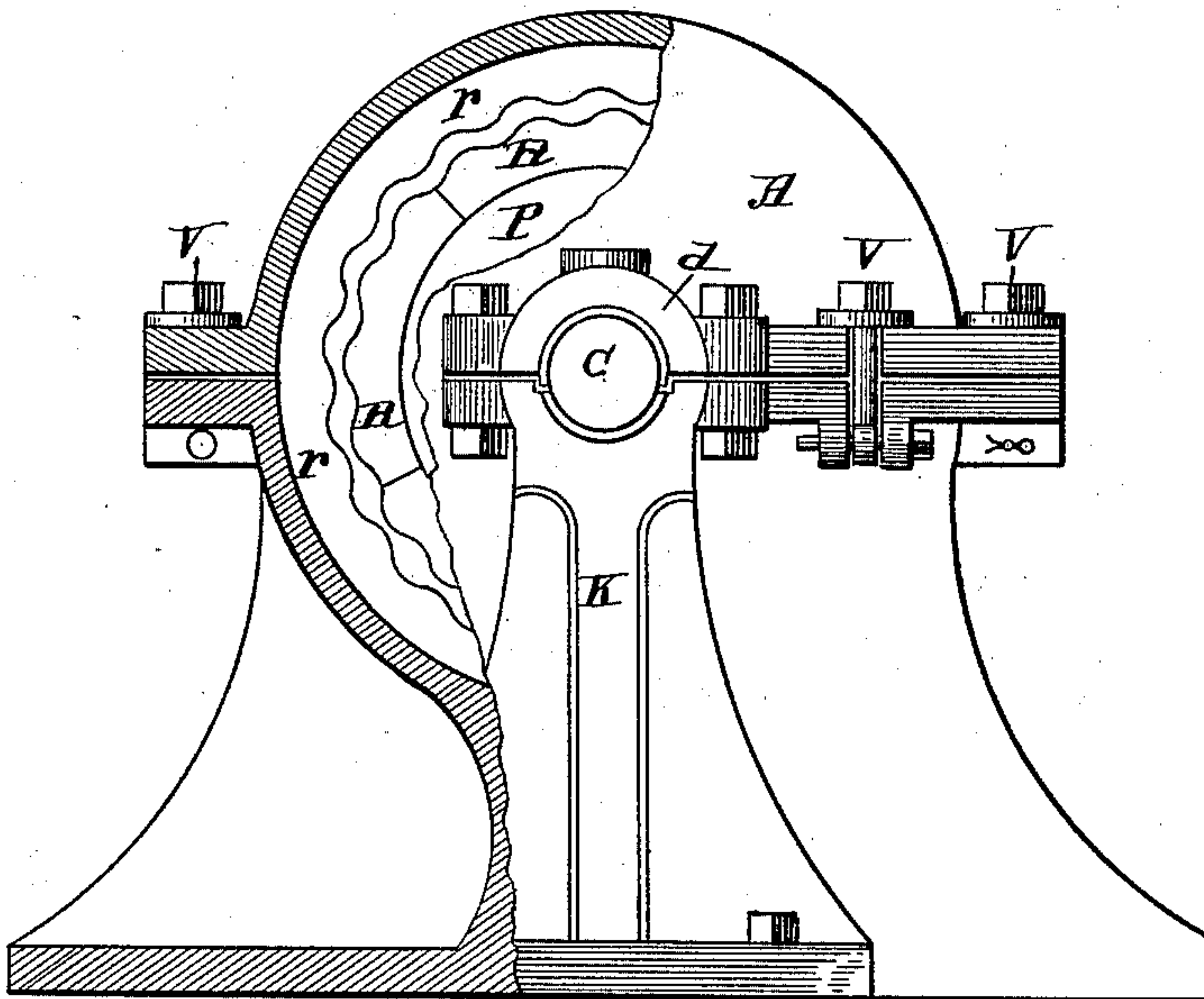
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Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK B. MEECH AND ALFRED H. MEECH, OF CLEVELAND, OHIO.

STONE AND ORE CRUSHING AND PULVERIZING MACHINE.

SPECIFICATION forming part of Letters Patent No. 385,638, dated July 3, 1888.

Application filed January 5, 1888. Serial No. 259,820. (No model.)

To all whom it may concern:

Be it known that we, FRANK B. MEECH and ALFRED H. MEECH, citizens of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Stone and Ore Crushing and Pulverizing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to improvements in machines for crushing and pulverizing ore, stone, and other analogous material; and the object of our invention is to provide a machine in which the grinding or crushing surfaces are readily detachable, so that when the said surfaces are worn and incapable of doing the work properly they can be removed and new plates substituted in their place.

Our invention consists of a closed bell-shaped shell or cone mounted in suitable supports provided with detachable ribbed or corrugated grinding-plates secured on the inside thereof, said plates being made of chilled iron or steel, and an inner shell or cone having similar detachable grinding-plates adapted to work within the outer shell or cone, the inner shell or cone being made adjustable in order to move it into the outer shell as the grinding surfaces or plates are worn away, and to regulate the degree of fineness to which the material is to be reduced.

Our invention consists, further, in making the corrugations in the grinding-plates larger at their inner ends than they are at their outer ends, so that the material is gradually reduced in size as it approaches the exit end of the machine, where the corrugations disappear and the plain faces of the plates come in contact to reduce the material to a pulverized condition. Other novel features will be more fully described hereinafter, and pointed out in the claim.

Referring to the drawings, Figure 1 is a side elevation of our improved machine. Fig. 2 is a vertical longitudinal sectional view of the same. Fig. 3 is an end view, partly in section, of the larger end of the machine. Fig. 4 is also an end view, partly in section, of the smaller end of the machine.

A indicates the outer shell and base, which

is divided longitudinally through its center into upper and lower sections, each section being provided with flanges B, having slots to receive the swing-bolts V, by which the upper and lower sections are held firmly together, while at the same time the bolts can be readily detached to allow the upper section to be removed, thus permitting the interior of the machine to be easily reached to replace the grinding surfaces or plates R and r when the same are worn out.

C is a shaft mounted in bearings D and d, on the outer end of which are mounted the band-pulley M and fly-wheel L, and also the hubs P, to which the grinding plates or surfaces R are secured by the bolts t. The bearing d at the smaller end of the machine forms part of the standard K, which is bolted or otherwise secured to the lower section of the outer shell.

D is a sliding bearing for the shaft C, located on the base at the larger end of the machine, and through which passes the adjusting-screw F, said screw being provided with a hand-wheel, H, and collar-guides I, firmly secured to the screw F, on each side of the neck or extension G, said neck or extension being a portion of the base or stand E.

J J are collars rigidly secured to the shaft C at each side of the bearing D, so that when the hand-wheel is turned in the proper direction the sliding bearing D, together with the shaft C and inner shell, will be moved endwise toward and into the outer shell to regulate the degree of fineness to which the material is to be reduced, and also to compensate for the wear of the grinding surfaces or plates.

N are packing-boxes having the packing material O therein, said packing-boxes being located at each end of the shell A and around the shaft C. The object of these packing-boxes is to prevent the escape of dust which would otherwise settle in the bearings and injure other portions of the machine.

U is an opening in the outer shell, to which is attached the feed spout or hopper U', and through which the material is fed to the machine.

X is a sliding gate mounted in the feed-hopper, one side of said gate being provided with notches to receive the catch or dog Y, and by

which means the amount of material to be fed into the machine is regulated.

As before intimated, the grinding surfaces or plates R and r are made of chilled iron or steel, and are provided with corrugations or grooves S, extending and decreasing in depth from the smaller toward the larger ends of the grinding-surfaces for about two-thirds the length of the plates, then coming to the surface, leaving the remainder of the surfaces plain and smooth, as shown in Fig. 2. The grinding-plates extend around the entire inside curved surface of the outer shell and the entire outside surface of the inner shell, and are firmly secured thereto by means of bolts Z and t, respectively. The outer shell, A, is provided with an opening, W, through which the pulverized material is allowed to escape.

In operating our machine power is applied to the pulley M to revolve the shaft C and inner shell, R, at a speed of about one hundred and seventy-five revolutions per minute in the direction to carry the material to be pulverized upward, over, and around between the grinding-surfaces R and r. The crushed stone, ore, or other material to be pulverized is admitted through the opening U, and is carried upward, over, and around and evenly distributed between the grinding-surfaces R and r,

and thereby kept most thoroughly and uniformly under operation until becoming sufficiently reduced and pulverized to gradually pass along between the smooth surfaces of the grinding-plates at the larger end of the machine and escape through the outlet W in a very finely-pulverized condition. Wet pulverizing may also be accomplished by connecting a water-pipe to the smaller end of the machine for the introduction of water.

Having thus described our invention, what we claim, and desire to secure by Letters Patent, is—

In a stone and ore pulverizing machine, an outer shell provided with plates having corrugations throughout a portion of their length, the remaining portion being plain, an inner shell provided with like plates adapted to rotate in the outer shell, whereby one portion of the plates is utilized for crushing the material and the other portion for pulverizing, as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK B. MEECH.
ALFRED H. MEECH.

Witnesses:

C. A. CHAPMAN,
J. W. S. WEBB.