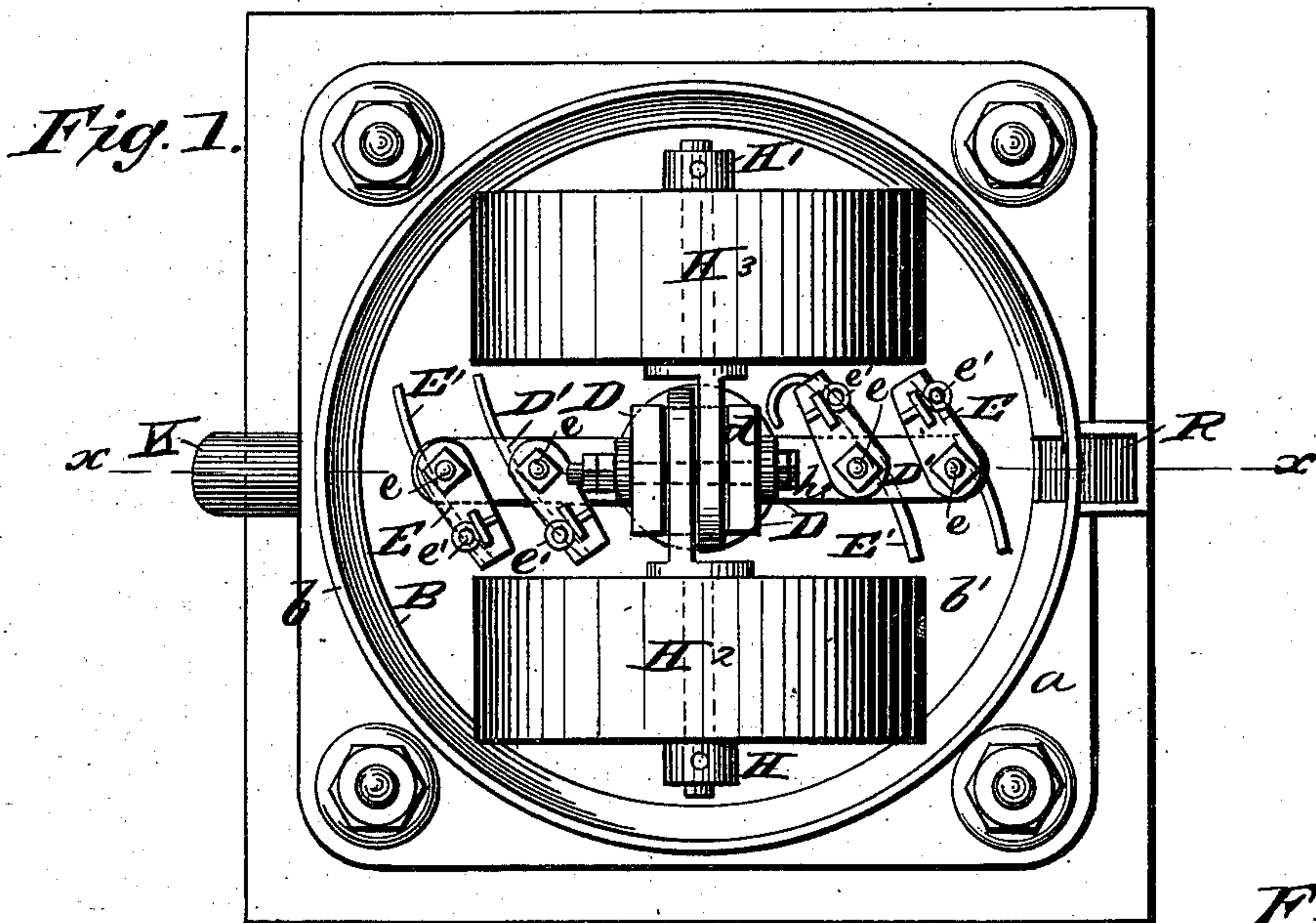


(No Model.)

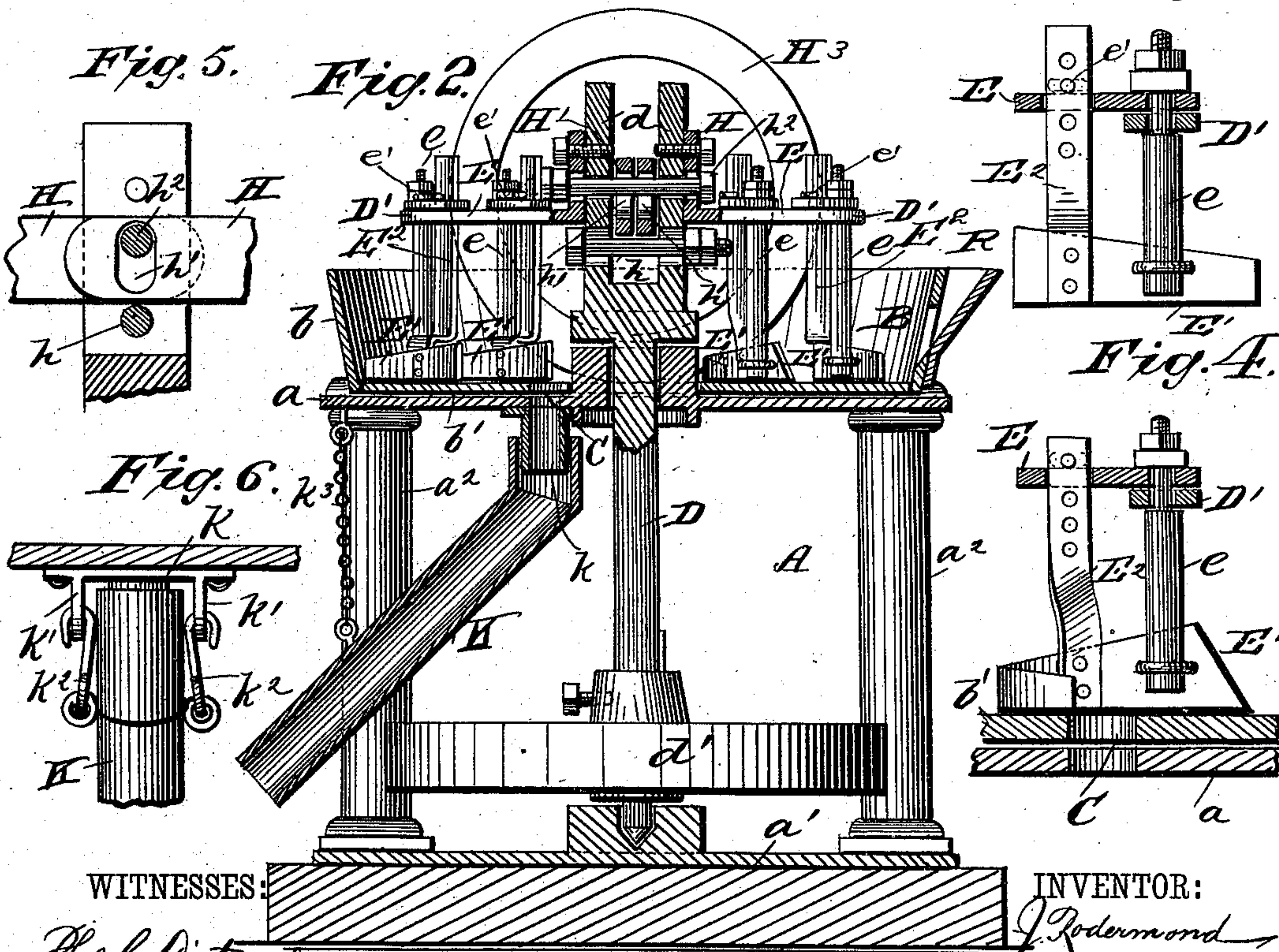
J. RODERMOND.  
ORE CRUSHER.

No. 400,601.

Patented Apr. 2, 1889.



*Fig. 3.*



**WITNESSES:**

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# UNITED STATES PATENT OFFICE.

JACOB RODERMOND, OF NEW YORK, N. Y.

## ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 400,601, dated April 2, 1889.

Application filed March 17, 1888. Serial No. 267,495. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB RODERMOND, of the city, county, and State of New York, have invented a new and Improved Ore-Crusher, of which the following is a full, clear, and exact description.

My invention relates to an improvement in ore-crushers, and has for its object to provide an apparatus upon the principle of a Chilean mill, which will be simple, durable, economical, and effective in operation.

The invention consists in the construction and combination of the several novel features of the apparatus, as will be hereinafter fully set forth, and pointed out in the claims.

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

Figure 1 is a plan view of the device. Fig. 2 is a central vertical section taken partially on line  $xx$  of Fig. 1. Figs. 3 and 4 are detail views of the shovels. Figs. 5 and 6 are detail views representing, respectively, the mode of journaling the crushers and the suspension of the off-take pipe.

In carrying out the invention, A represents a frame consisting of spaced top and bottom plates,  $a$  and  $a'$ , held a suitable distance apart by perpendicular posts, standards, or pillars  $a^2$ , and a preferably-cylindrical upwardly-projecting flange,  $b$ , secured to the upper surface of the top plate,  $a$ , forming an ore-receptacle, B, which receptacle is provided with a false detachable bottom,  $b'$ . A vertical shaft, D, is journaled in bearings integral with the upper and lower plates, and the upper end of said shaft is enlarged and bifurcated, as shown at  $d$  in Figs. 1 and 2. At or near the lower end of the shaft a horizontal pulley,  $d'$ , is keyed, which pulley is belted to any convenient drive-shaft. A series of aligning apertures is provided in the upper members of the shaft, and to the outer faces of the said members a horizontal arm,  $D'$ , is secured, from which arms perpendicular spaced rods  $e$  project downward to within a short distance of the bottom of the receptacle B. The upper ends of the rods  $e$ , passing through the arms  $D'$ , are reduced and threaded and adjustably held in connection with the said arms

by means of set-nuts, as illustrated in Figs. 3 and 4. Above the arms  $D'$  and below the nuts one end of a horizontal plate, E, is held in engagement with the rods, and the said plates, while adjustable, are preferably set to have an inclination in direction of the shaft D.

To the lower ends of the rods  $e$  shovels  $E'$  are attached, the outer ends whereof are adjustably connected to the plate E by an apertured vertical plate,  $E^2$ , attached to the shovels and extending through the arms, held at the desired elevation by a pin,  $e'$ . The purpose of the shovels is to carry the crushed ore from the sides of the receptacle B to the center and deliver the same to an aperture, C, in the false bottom of the said receptacle at or near the center, as illustrated in Fig. 2. To facilitate this delivery one inner shovel is curved inward at the toe, as shown in detail, Fig. 4, and as applied in Fig. 2.

A spout,  $k$ , is made to surround an aperture in the plate  $a$ , which aperture registers with the delivery-aperture C in the receptacle B, and at each side of said spout lugs  $k'$  are attached to the upper plate,  $a$ , and links or chains  $k^2$  connect the said lugs with the upper end of a delivery pipe or chute, K, at which upper end an elbow is provided adapted to surround the spout  $k$ , as shown in Figs. 2 and 6. The delivery-pipe is further supported by a chain,  $k^3$ , secured to the upper plate at one end.

A bolt,  $h$ , preferably projects through the lower aligning apertures in the upper bifurcated ends of the shaft D, and upon said bolt the inner flattened ends of independent axles H H' are made to rest side by side, the said axles extending outward in opposite directions. The said flattened ends of the axles are provided with vertical elongated slots  $h'$ , and the said axles are pivoted between the members of the shaft D by a bolt or threaded pin,  $h^2$ , passing through the members and the slots in the axles. The bolts  $h$  and  $h^2$  are each retained in position by a suitable nut and nut-lock.

Upon the outer ends of the axles H and H' weighty cylindrical crushing-rollers  $H^2$  and  $H^3$  are held to revolve, traveling within the receptacle B. It will be observed that by reason of the separate axles the said rollers



are entirely independent one of the other, and that by reason of their peculiar attachment to the shaft D, should either roller meet with an obstruction, they have sufficient vertical play to override the same without retarding or interfering with the movement of the opposite roller.

The material to be crushed is preferably fed, in any suitable manner, into a hopper, R, built upon one outer side of the receptacle B, having direct communication therewith.

The false bottom *b'* may be replaced when worn out by another, and it takes the wear from the plate *a*, which forms the permanent bottom of the receptacle B.

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

1. The combination, with the ore-receptacle and the vertical shaft bifurcated at its upper end, of the axles H, overlapped at their inner ends and having vertical aligned slots *h'*, the bolt *h<sup>2</sup>*, passed through the said bifurcated end and slots, a second bolt, *h*, below the bolt *h'*, and on which the under sides of the slotted ends of the axles rest, and the crushing-rollers on said axles, substantially as set forth.

2. The combination, with the ore-receptacle, the crushing-rollers, and their operating-shaft, of a horizontal arm, D', projecting from the said shaft, a plate, E, secured to the said arm at an angle thereto, the vertical rod *e*, de-

pending from arm D', the shovel on the lower end of said rod and having a vertical plate, E<sup>2</sup>, extending up through the plate E and secured thereto, substantially as set forth.

3. The combination, with the ore-receptacle, the vertical shaft, and the crushing-rollers, of the horizontal arms D', projecting from said shaft between the rollers, the vertical spaced rods *e*, having shovels on their lower ends and extending at their upper ends through the arms D', the slotted plates E, adjustable horizontally on said upper ends, and the apertured vertical plates E<sup>2</sup>, extending from the shovels up through the slots in plates E, and the securing-pins *e'*, substantially as set forth.

4. The combination, with a receptacle having an open top and outlet-aperture, a spout therefor, a chute suspended from the bottom of the receptacle, engaging the spout, a vertical shaft journaled in the receptacle, provided with a bifurcated upper end, and crushing-rollers provided with independent axles pivoted in the bifurcated shaft end, of opposing horizontal arms secured to the shaft between the rollers, and adjustable shovels carried by said arms, adapted to follow the rollers, substantially as and for the purpose specified.

JACOB RODERMOND.

Witnesses:

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HERMAN PIETSCH.