

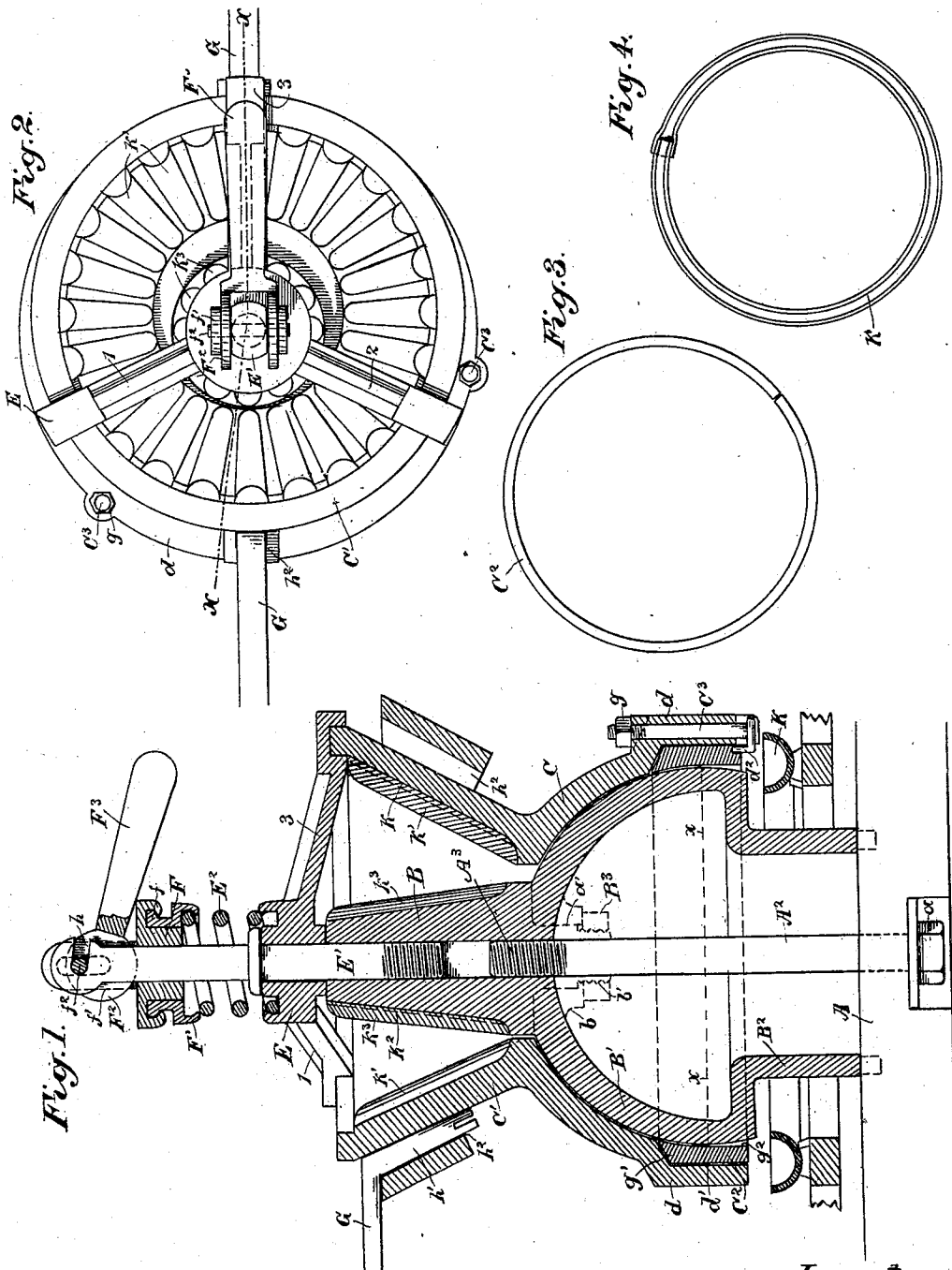
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Patented July 1, 1902.

A. J. PETTER.
ORE CRUSHER AND PULVERIZER.

(Application filed Aug. 22, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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ORE CRUSHER AND PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 703,461, dated July 1, 1902.

Application filed August 22, 1900. Serial No. 27,715. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH J. PETTER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Ore Crushers and Pulverizers; and I do hereby declare the following to be a full, clear, and exact description of the same.

The present invention relates to a certain new and useful ore crusher and pulverizer for use in connection with laboratories or for prospecting purposes; and it consists in the arrangement of parts and details of construction, as will be hereinafter fully set forth in the drawings, and described and pointed out in the specification.

The objects had in view are to provide a simple and effective machine which may be readily transported from place to place and by means of which the ore may be either crushed or pulverized or by means of which the combined action of crushing and pulverization of the ore may be obtained, to provide a machine especially adapted for laboratory or prospecting purposes, and to provide a machine which may be readily taken apart and its wearing parts readily adjusted to compensate for wear.

In order to comprehend the invention, reference must be had to the accompanying sheet of drawings, wherein—

Figure 1 is a vertical sectional view of the machine in side elevation; Fig. 2, a top plan view of the machine; Fig. 3, a detail view of the die or wearing ring, and Fig. 4 a similar view of the trough for receiving the discharged ore.

In the drawings the letter A is used to indicate the base or platform upon which the machine rests or is supported. To this base or platform is secured, by nut a , the vertically-extending spindle A^2 , which spindle at its upper end carries the cone-shaped crushing-head B. Integrally secured to the head B is a depending convexed or spheroidal shell B' , which shell at its lower edge is provided with the inturned depending flange B^2 . This flange B^2 rests upon the upper face of the base or platform A and serves as a support for the convexed or spheroidal shell B' . In the present instance the head B and the shell

B' are secured to the spindle A^2 through the medium of a screw-threaded connection A^3 . Instead of forming the head and shell integral, as hereinbefore described, it will be obvious that such members may be formed independently, in which event the head will be provided with a lower reduced portion a' , adapted to fit a hub or enlarged portion b on the shell, the two being rigidly secured together by means of a nut B^3 . (All shown in dotted lines, Fig. 1.) The stem A^2 may in some instances be formed integral with either the head or shell. Over the shell B' is fitted the concaved shell C, which shell is formed with an upwardly-inclined hopper C' . The shell C extends slightly below the center x of the shell B' , and this portion of the shell is slightly offset, as shown at d , in order to provide a seat d' for the die or wearing ring C^2 . This die or wearing ring is a split one and is held in place by the upturned flanged end d^2 of the adjusting-bolts C^3 , which bolts pass through the offset portion d of shell C. The adjusting-bolts are held in place by the nuts g , secured upon the screw-threaded portions thereof. It will be observed that the upper edge g' of the die or wearing ring is formed at an incline in order to correspond with the inclination of the offset portion of the shell C and permit of the ring registering therewith. The face of this ring below the center line of the shell B' is made straight, as shown at g^2 , so as to permit of the shell C oscillating upon shell B' without binding, which otherwise it could not do, as the diameter of shell C at its lower edge would be less than that of shell B' at x .

The shell C is held upon shell B' by means of the spider E, the arms 1 2 3 of which engage the upper edge of hopper C' . The spider fits loosely upon the stem E' , screwed into and upwardly projecting from head B, and is held down by spring E^2 , which spring surrounds the stem E' and is held between the spider and collar F. There is interposed between the spring and collar F a washer F' , which washer is held to the collar by a swivel connection f . The collar is provided with the upwardly-extending slotted shoulders f' , between which work the eccentric cams F^2 . These cams bear upon collar F and are connected to the bifurcated end of lever F^3 . This lever straddles the upper end of stem E' and is

held in place by the bolt f^2 , which bolt passes through the slotted shoulders f' of collar F and rests within the inclined slot h , cut in the upper end portion of stem E'. By means of this cam-lever the spring E² is compressed or released. The arms 1 2 of the spider are slightly shorter than arm 3. Consequently the hopper C' stands eccentrically to the head B. Being thus held, a gyratory motion is imparted 10 to the hopper C' and its shell C as the hopper is rotated. To the hopper are connected the arms G, the flanged ends h' of which fit within the sockets h^2 of the hopper.

Within the inner face of the hopper are 15 formed a series of vertical grooves k , within each of which is fitted a rib k' . A series of vertical grooves k^2 are formed in the face of the head B, and in each groove is fitted a rib k^3 . It will be understood that the face of the 20 hopper and of the head may be corrugated, if so desired; but I prefer the inserted ribs, as they may be removed at any time in case of excessive wear and new ones inserted in lieu thereof.

25 The ore fed into the hopper is crushed by being pressed against the cone-shaped head during the gyratory motion of the hopper, which is actuated in the present case by the operator exerting pressure alternately upon 30 the handles or arms G. As the ore is crushed or broken it gradually works downward toward the shells and passing therebetween is gradually pulverized by the action of shell C upon shell B'. As discharged from between 35 the shells it falls into the ore-receiving trough K, located thereunder. This trough is circular in form and the free ends thereof overlap. Preferably the trough is made of rubber; but this is immaterial, as the same may 40 be made of any suitable material.

In case of wear upon the die-ring it is only necessary to remove the same from its seat and file or cut away a portion thereof at its joint. This shortens or reduces the length 45 of the ring, and hence its diameter, when joined or forced together by being drawn to its seat by the adjusting-bolts.

To remove the upper shell and hopper, the cam-lever is thrown upward and then drawn 50 outward in order to remove its transverse pin or bolt from within the slot of stem E'. When thus released, the spider and connecting parts may be lifted off the said stem. The hopper and its shell are then free to be raised from off 55 of shell B'.

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

1. In an ore crusher and pulverizer, the 60 combination with the cone-shaped crushing-head, of means for securing the same to the base or platform of the machine, a spheroidal shell secured to and depending from the crushing-head, an inclined hopper surround-

ing the crushing-head, means by which a gy- 65 ratory motion is imparted to said hopper, a spheroidal shell depending from the hopper, which shell surrounds and works upon the shell of the crushing-head, a die-ring having a smooth periphery secured to the inner face 70 of the outer shell at its lower edge, and of devices for adjusting the die-ring.

2. In combination substantially as described, superposed crushing-shells one of 75 the same having an offset portion adjacent its lower end, a wear-ring inserted in said offset portion from the lower end of the shell having a smooth surface disposed toward said offset portion, and means for adjusting the ring.

3. In combination, substantially as de- 80 scribed, superposed crushers, one of the same having an offset portion having an inclined upper wall, a split wear-ring inserted in said offset portion having a correspondingly-inclined upper edge, and means for causing the 85 inclines of the ring and offset portion to engage and adjust the ring relative to the grinding-surfaces.

4. In combination, substantially as described, a head; a shell depending from the 90 head; a second shell mounted on the outside of said first-mentioned shell; and means for regulating the pressure of one shell upon the other comprising a stem on the head, a spider 95 slidable on the stem engaging the edges of said outer shell, a spring bearing upon the spider, and a cam-lever at the end of the stem bearing upon the spring.

5. In combination, substantially as described, a head; a shell depending from the 100 head; a second shell on the outside of said first-mentioned shell; and means for regulating the pressure of one shell upon the other comprising a stem on the head, a spider slid- 105 able on the stem engaging the edge of said outer shell, a spring seated upon the spider, a swivel-bearing for the upper end of the spring, and means at the end of the stem adapted to press upon the swivel-bearing.

6. In combination, substantially as de- 110 scribed, a head; a shell depending from the head; a second shell on the outside of said first-mentioned shell; and means for regulat- 115 ing the pressure of one shell upon the other comprising a stem on the head, a spider slidable on the stem engaging the edge of said outer shell, a spring seated on the spider, a bearing for the upper end of the spring, slot- 120 ted ears on the bearing, and a cam-lever at the end of the stem working in the slotted ears adapted to press upon the spring-bearing to tension the spring.

In witness whereof I have hereunto set my hand.

ADOLPH J. PETTER.

Witnesses:

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