

No. 616,658.

Patented Dec. 27, 1898.

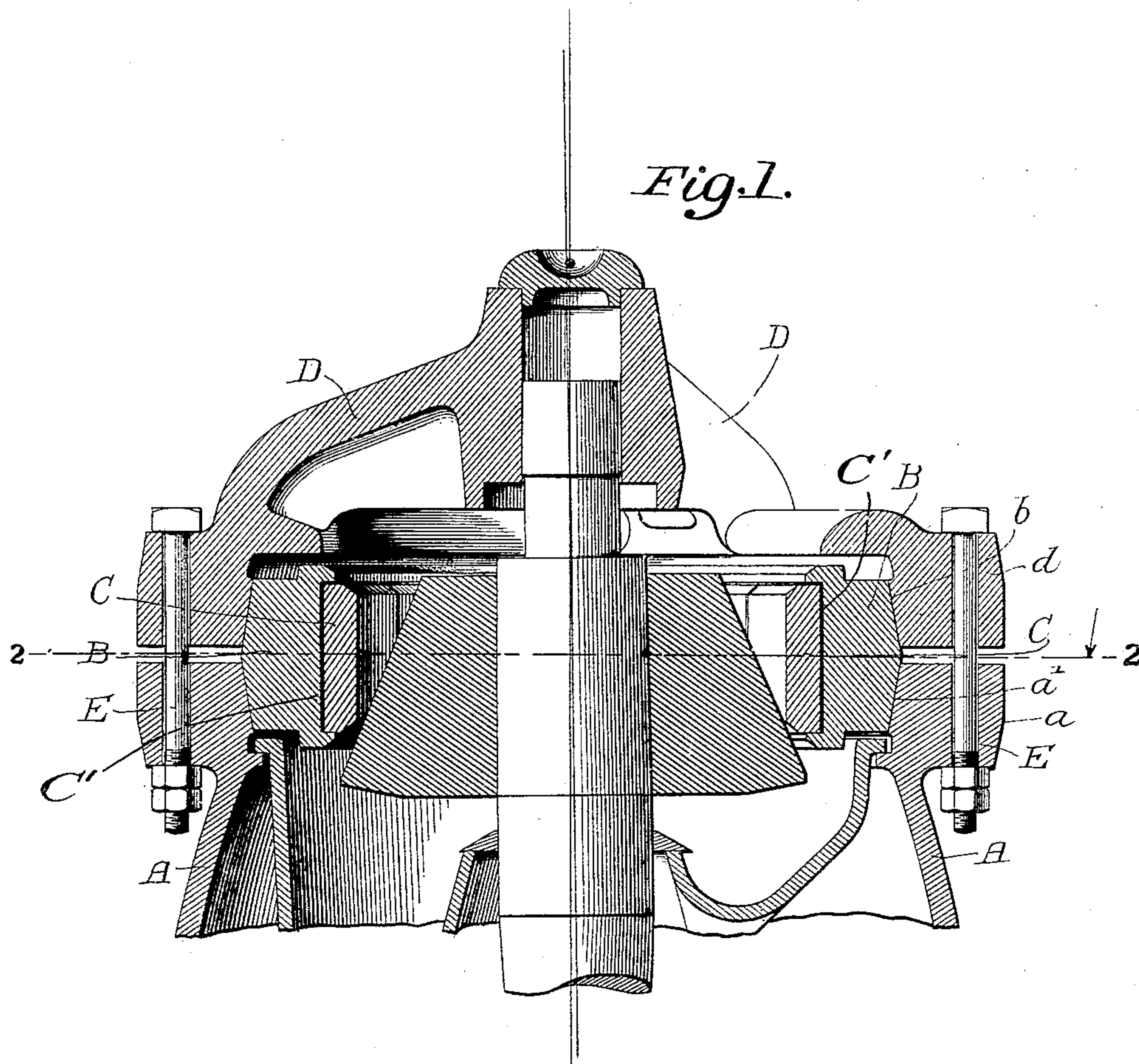
A. J. & P. W. GATES.

ROCK OR ORE BREAKER.

(Application filed Apr. 30, 1897.)

(No Model.)

2 Sheets—Sheet 1.



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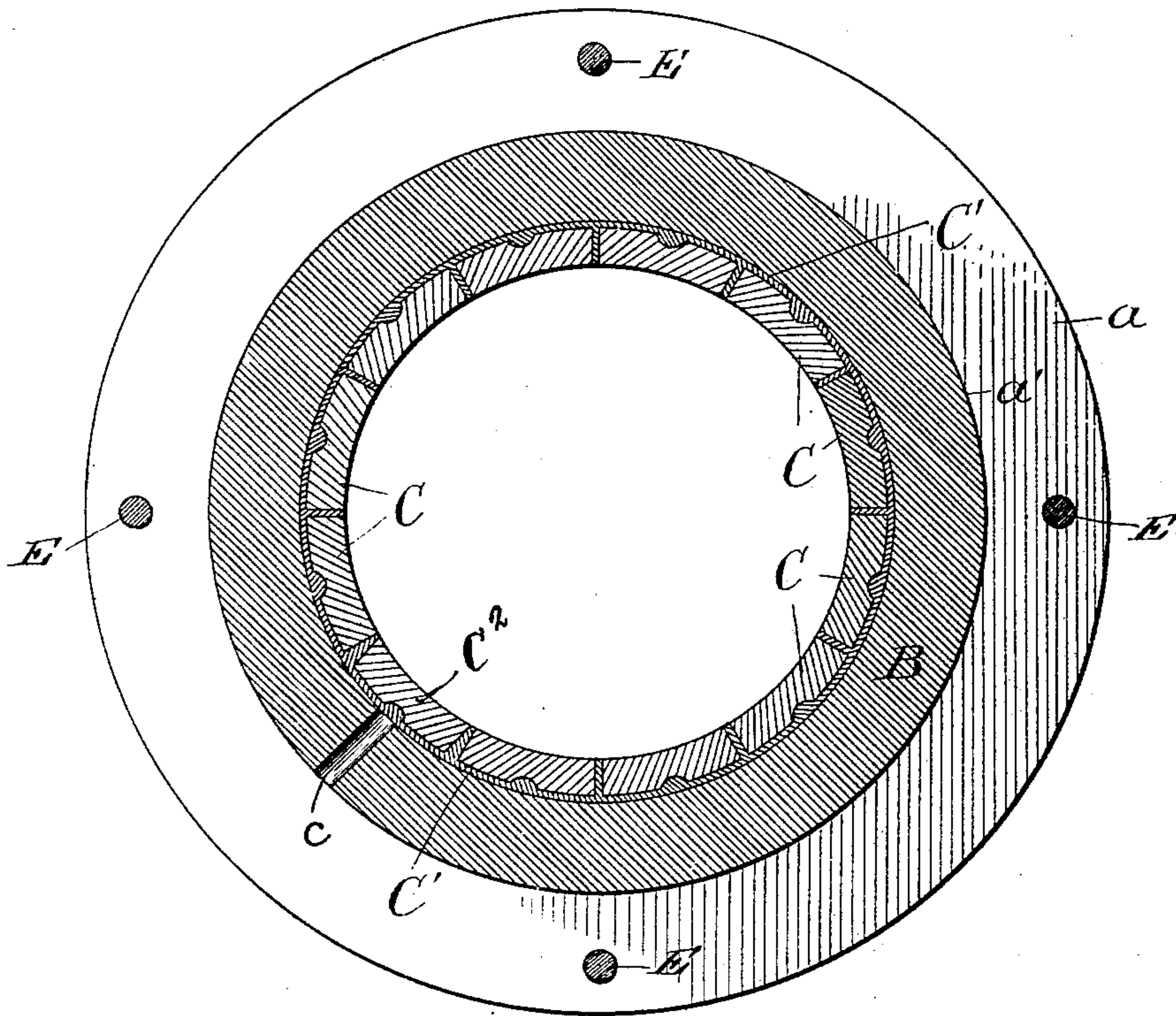
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2. Sheets—Sheet 2.

Fig. 2.



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# UNITED STATES PATENT OFFICE.

ALBERT J. GATES AND PHILETUS WARREN GATES, OF CHICAGO, ILLINOIS,  
ASSIGNORS TO THE GATES IRON WORKS, OF SAME PLACE.

## ROCK OR ORE BREAKER.

SPECIFICATION forming part of Letters Patent No. 616,658, dated December 27, 1898.

Application filed April 30, 1897. Serial No. 634,519. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT J. GATES and PHILETUS WARREN GATES, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Rock or Ore Breakers, of which the following is a specification.

The object of our invention is to provide a simple, economical, and efficient rock and ore breaker; and the invention consists in the features, combinations, and details of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 represents a vertical sectional elevation of the upper part of a rock and ore breaker constructed in accordance with our improvements, and Fig. 2 a plan sectional view taken on line 2 of Fig. 1.

In the art to which this invention relates it is well known that the frame portion of the crusher consists generally of a lower portion, an upper shell portion that contains and holds the crushing-concaves, and a spider portion, and that the crushing-concaves always wear out at the lower portion thereof, so that when such lower portion is worn the concaves have to be thrown away. Our invention is intended, therefore, to obviate these objections and provide a crushing-frame of practically two parts, in which the shell is positioned by the clamping together of the spider and main frame, and the shell and its crushing-concaves may be inverted, so that its upper and lower portions may be presented as the working surfaces in order to compensate for the wear.

In illustrating and describing our improvements we will only illustrate and describe those portions which we consider to be novel in connection with so much that is old as will enable those skilled in the art to practice the invention, leaving out of consideration the old and well-known mechanisms which are thoroughly understood by persons skilled in the art, which, if described and illustrated herein, would only tend to confusion and ambiguity.

In constructing a crusher in accordance with our improvements we make a lower frame

portion A of the desired size and shape and provide it with an annular flange or bead *a* at the upper portion thereof. This upper portion is provided with a central opening tapering downwardly and inwardly, as at *a'*, and in which an annular shell B is inserted, which carries the crushing-concaves C and which is also beveled, as at *b*, on its upper portion, such bevel being practically the same as the bevel on its lower portion, so that its position may be inverted—that is, the upper part of the crushing-concave may be presented as the lower working surface whenever it becomes desirable or necessary. The crushing-concaves C are inserted in the annular shell in the ordinary manner, as shown particularly in Fig. 2. The sides of these annular concave sections are cut radially—that is, all are drawn to a common center. One of these sections, particularly the section C<sup>2</sup>, has its sides parallel and forms, as it were, a key-shell, and all of the sections are inserted in a body of zinc C', interposed between the crushing-concave sections and the annular holding-shell B. This holding-shell is provided with a perforation *c*, through which a pin may be inserted for the purpose of driving out the key-concaved section, and thus permitting the other concaved sections to be withdrawn whenever necessary for removal or repair.

A spider D, which forms a portion of the frame, is provided, having an annular flange, bead, or lug *d* at its lower portion, and is also supplied with bolt-holes, through which the securing-bolts E may be passed that secure the spider to the main frame portion. As shown in the drawings, the spider is provided with a tapered inner recess or opening adapted to coincide with the taper on the upper part of the crushing-shell, so that the act of securing the parts together also positions the annular frame or shell with its crushing-concaves. It will be seen also that one portion is practically dispensed with—viz., the old ordinary upper shell—and also one joint, which makes the machine very simple and economical to build and very efficient in the crushing of fine particles—that is, our invention as above described and shown in the draw-



ings is particularly adapted to small machines in that it provides a structure by which small mechanisms can be economically manufactured and assembled and in which rock  
5 and ore can be crushed into very fine particles.

While we have described our invention with more or less minuteness as regards details and as being embodied in certain precise forms, we do not desire to be limited  
10 thereto unduly or any more than is pointed out in the claims. On the contrary, we contemplate all proper changes in form, construction, and arrangement, the omission of immaterial elements and the substitution of  
15 equivalents, as circumstances may suggest or necessity render expedient.

We claim—

1. In a rock and ore breaker, the combination of a main body or frame portion, an annular frame or shell removably and reversibly secured in the main body portion, and crushing-concaves removably secured in the annular shell substantially as described.

2. In a rock and ore breaker, the combination of a lower frame portion, an upper spider  
25 portion, and a shell portion provided with

crushing-concaves removably and reversibly held between such portions substantially one-half in each, substantially as described.

3. In a rock and ore breaker, the combination of a frame portion made in two parts, a lower main portion and an upper spider portion the lower portion provided with a downwardly and inwardly inclined surface and the upper or spider portion provided with an  
35 upwardly and inwardly inclined surface, an annular tapered frame or shell removably and reversibly held between such portions substantially one-half in each and adapted to be positioned by the clamping together of such  
40 parts, crushing-concaves secured to such cylindrical tapered frame or shell and adapted to be inverted by the inverting of such shell, and bolt mechanism for securing the upper and lower portions of the frame portion together,  
45 substantially as described.

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