

(No Model.)

2 Sheets—Sheet 2.

F. A. HUNTINGTON.

ORE CRUSHER.

No. 356,044.

Patented Jan. 11, 1887.

FIG. 3.

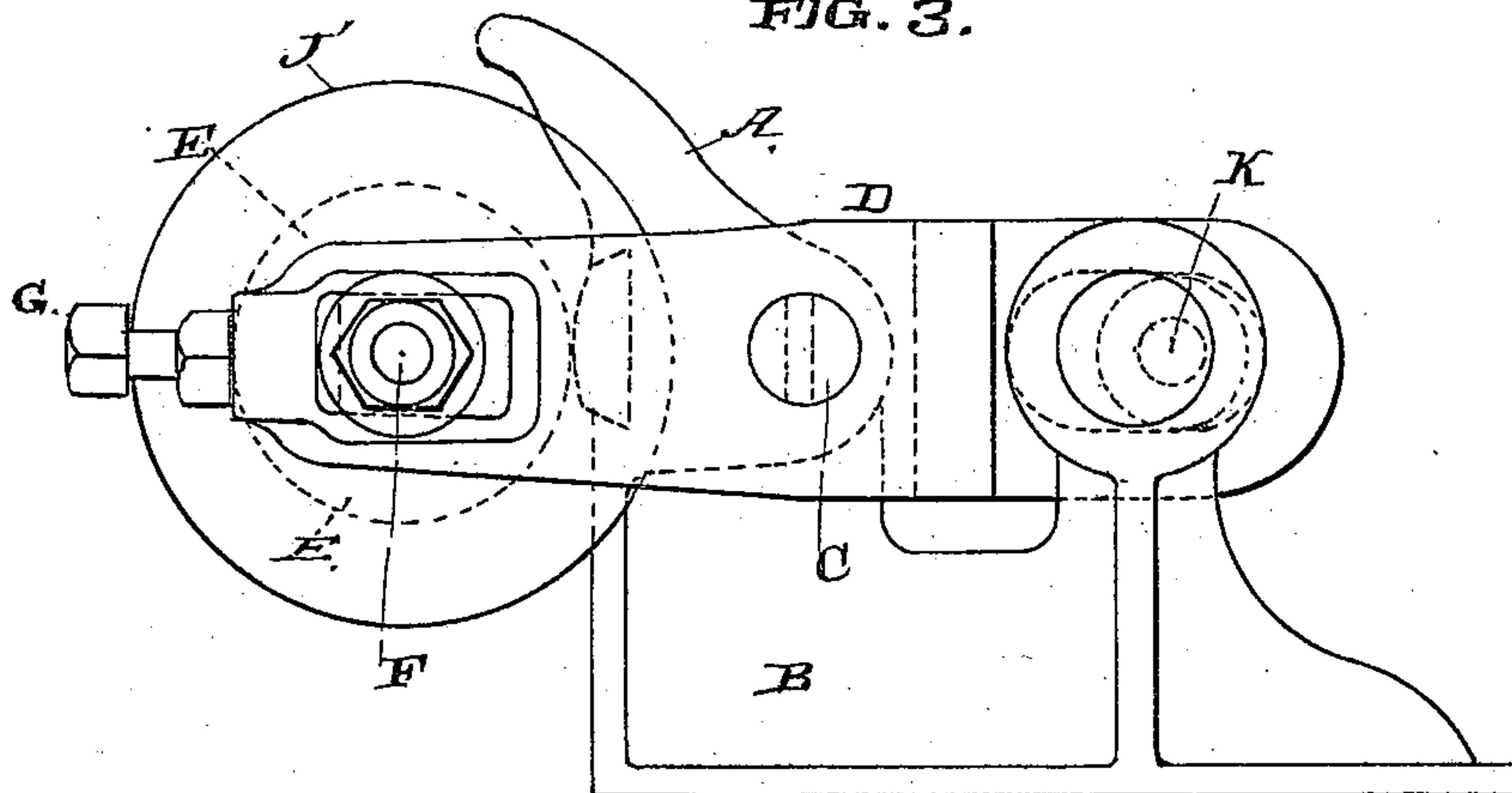
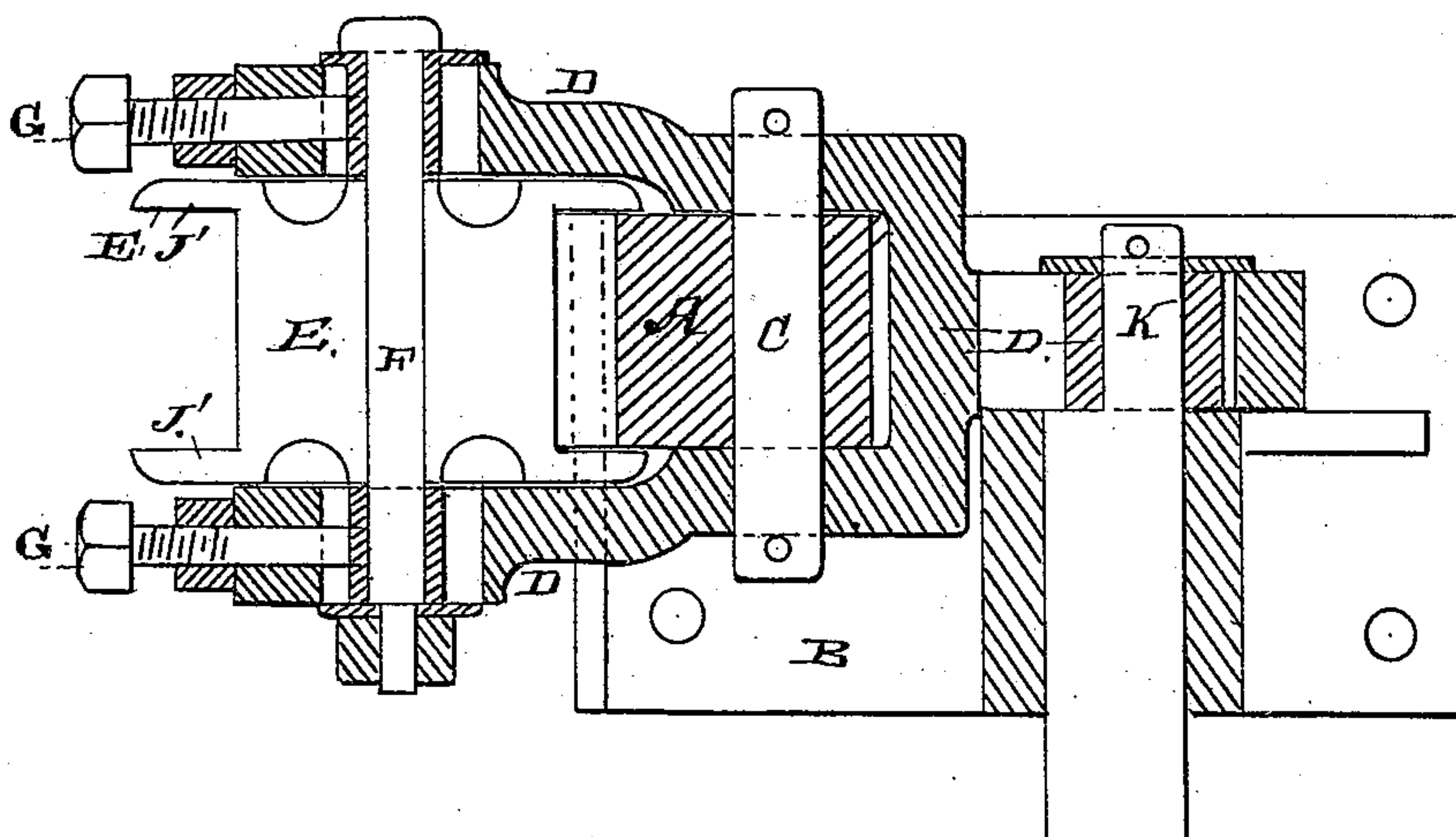


FIG. 4.



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UNITED STATES PATENT OFFICE.

FRANK A. HUNTINGTON, OF SAN FRANCISCO, CALIFORNIA.

ORE-CRUSHER.

SPECIFICATION forming part of Letters Patent No. 356,044, dated January 11, 1887.

Application filed February 27, 1886. Serial No. 193,528. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. HUNTINGTON, of the city and county of San Francisco, State of California, have invented an Improvement in Ore-Crushers; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to a machine for breaking or crushing rock or other similar material.

It consists in the construction and combination of devices hereinafter described and claimed, and explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the machine provided with an operating-handle. Fig. 2 is a horizontal section of the same. Fig. 3 is a side elevation of the machine having an eccentric, crank, or other driver applied in the place of a handle; and Fig. 4 is a horizontal section of the same.

In a former patent, issued to me August 25, 1885, No. 324,937, I have shown a loosely-rotating cylinder in combination with a stationary jaw, between which and the cylinder the material is crushed. In the present case the jaw A is formed with or mounted upon a suitable supporting-base, B, so as to be either stationary or movable. The face of this jaw is curved, as shown, the middle portion being an arc of a circle described about the center C, which forms the fulcrum for the lever or arm D, upon the end of which the cylinder E is loosely journaled, turning upon a pin, F. This pin may be adjusted in slots in the ends of the arms D, so as to move the cylindrical crusher E nearer to or farther from the face A, this adjustment being made by screws G at the outer ends of the arms, as shown. In Figs. 1 and 2 I have shown the arms D fitted to receive an extension or lever, H, by which they may be oscillated about the center C.

The upper part of the jaw A, which is convex at or near its center, forms a reverse curve, as shown at I, whereby the ore is crushed between the upper portion of the jaw and the cylinder by the upward movement of the latter, and afterward ground between said roller and the convex portion of said jaw. Flanges J are formed upon each side of said jaw, between which the cylinder E passes, so as to roll in contact with the jaw A.

The operation of this form of the invention is as follows: By moving the lever H up and down the cylinder E will be caused to roll in contact with the convex curve of the jaw A, this curve being formed in a line with the fulcrum-pin C of the arms D, which is also the center of the curve, so that any material introduced between the cylinder and the jaw will be retained by the side flanges, J, and crushed as fine as may be desired, falling out at the lower part.

In some cases, where more power is desired, instead of applying the hand-lever H, a shaft is journaled upon the rear part of the base, this shaft having a crank or eccentric pin, K, which passes through the rear portion of the lever arm or arms D; and the crank-shaft may be driven by a belt, pulley, gear, crank-wheel, or other device, depending upon the size of the machine. In some cases it may be advisable to construct the crushing-cylinder E with flanges J', and leave the crushing-jaw A plain, the flanges J' extending upon each side of the crushing-jaw; but it will be manifest that the operation is the same in either case.

In order to insure the proper rotation of the cylinder, so that if wet rock or material be placed between it and the jaw it will be carried out by the movement of the cylinder, I employ a pawl, which may be pivoted to the lower part of the frame, so that its outer point, L, may press against the edge or flange of the cylinder, its inner end being weighted; or it may be actuated by a spring or other suitable contrivance, so that when the rear end of the arm or lever is raised and the cylinder depressed this pawl will press against the face or rim and cause it to rotate slightly.

When the lever is depressed so that the cylinder is raised, it will roll upon the jaw A and the material which is between it and the jaw, thus crushing it and carrying it downward, as before described.

This machine may be made of any suitable or convenient size, and is especially useful for assays and other small work.

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

1. A crushing-machine comprising a jaw having a fulcrum-pin passing through its rear,

said jaw being convex at its center and concave at its upper portion, lever-arms fulcrumed upon said pin, and a cylinder mounted in said lever-arms, whereby the ore is both crushed and ground between the cylinder and the jaw, substantially as herein described.

2. The combination, with a jaw having a fulcrum-pin passing through the rear, said jaw being convex at its center and concave at its upper portion, of lever-arms fulcrumed upon said pin, and a cylinder loosely journaled and adjustably secured in the opposite ends of said arms and rotating in contact with the jaw, whereby the ore is both crushed and ground between said cylinder and jaw, substantially as herein described.

3. The combination, with a jaw having a fulcrum-pin passing through the rear, and lever-arms journaled upon said pin, of a loosely-

rotating cylinder journaled in the opposite ends of said arms and adapted to rotate in contact with said jaw, and a pawl by which the cylinder is caused to rotate at each oscillation of the lever, substantially as herein described.

4. The convex jaw and arms fulcrumed to its rear portion and extending upon each side to the front, in combination with a roller having a journal-pin moving in slots in the arms, and screws whereby it may be adjusted to or from the face of the jaw, substantially as herein described.

In witness whereof I have hereunto set my hand.

FRANK A. HUNTINGTON.

Witnesses:

LINCOLN SONNTAG,
S. H. NOURSE.