

(No Model.)

2 Sheets—Sheet 1.

A. G. & J. M. DYER.
ROCK CRUSHER AND PULVERIZER.

No. 311,235.

Patented Jan. 27, 1885.

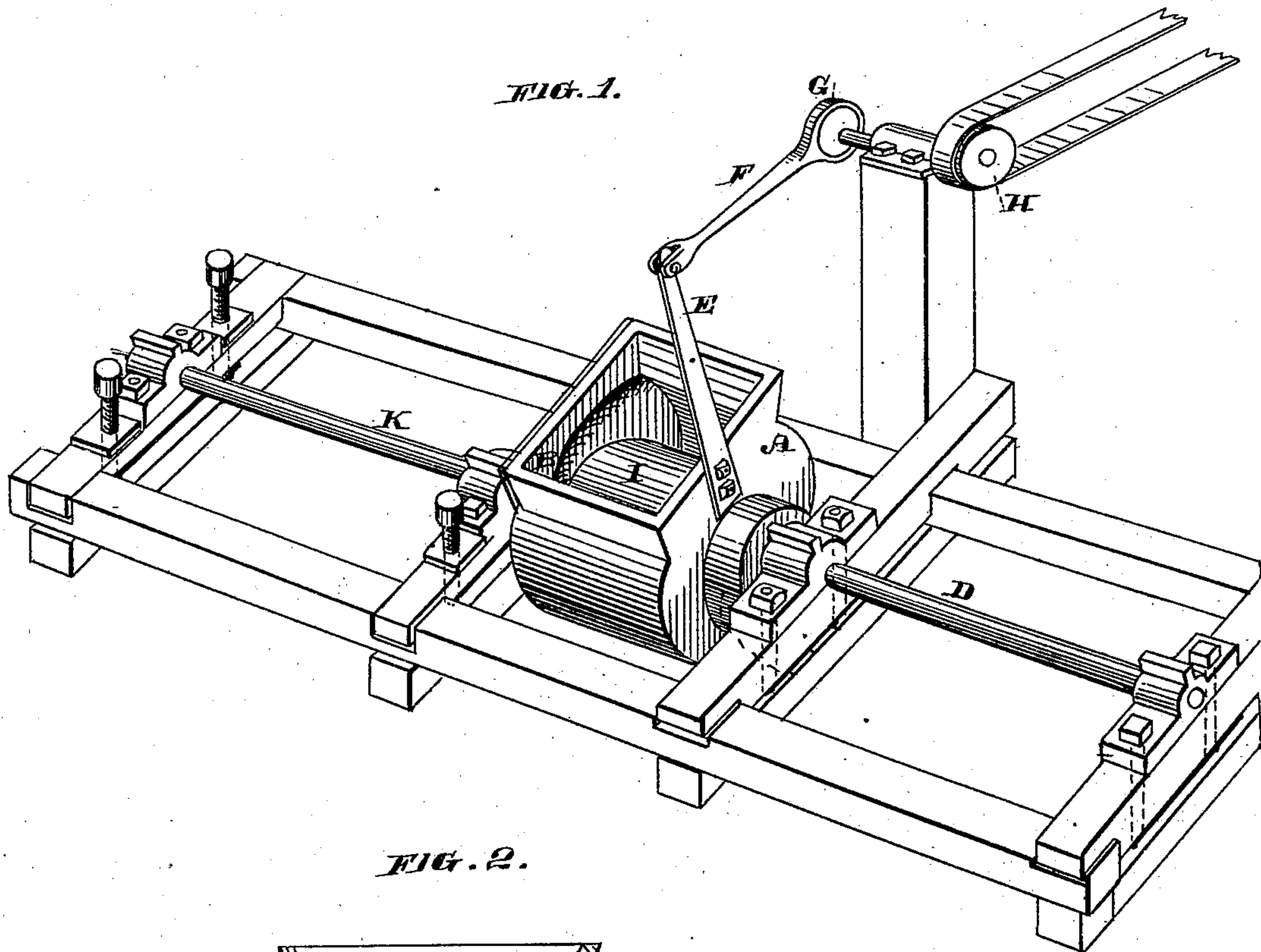


FIG. 2.

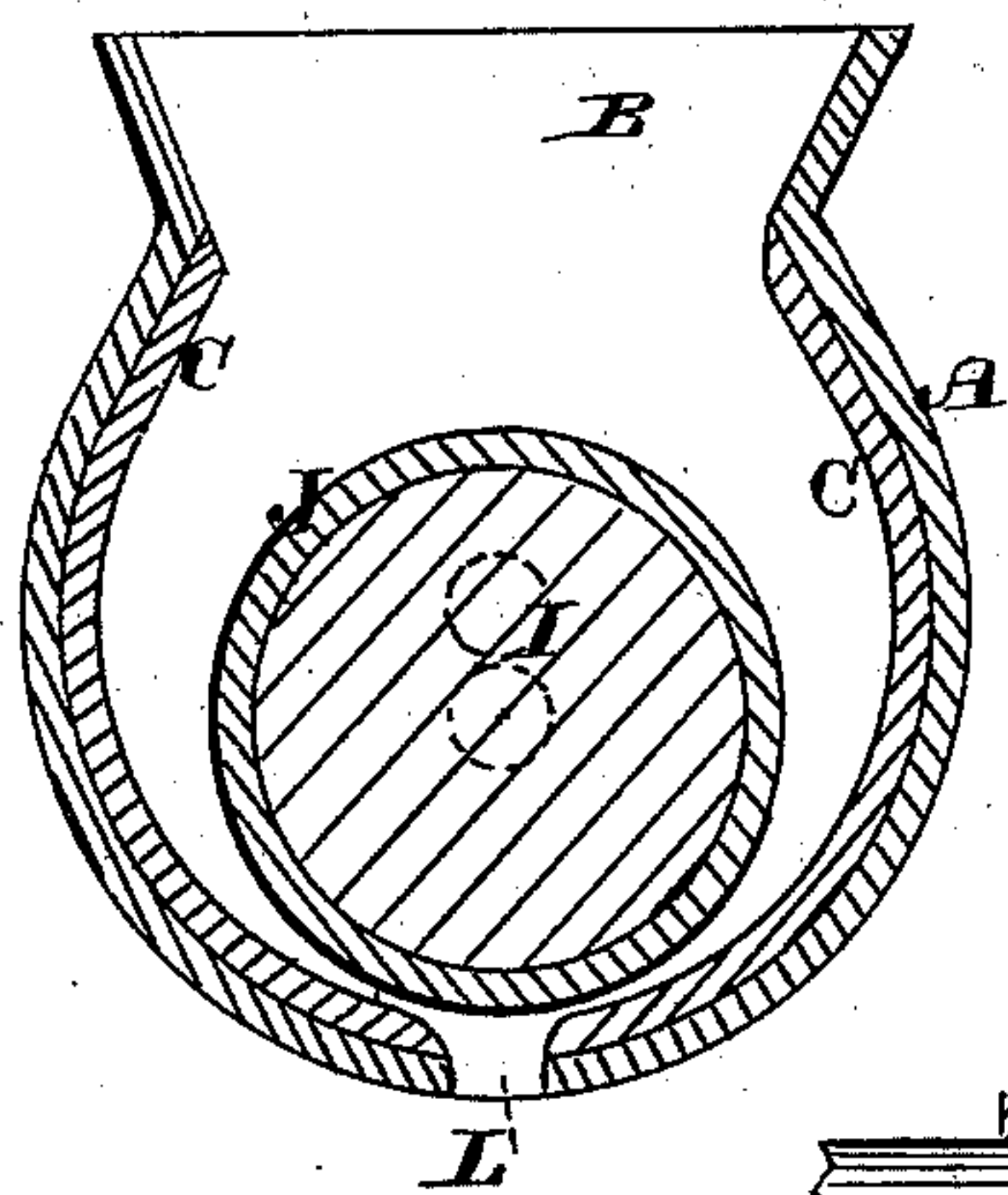
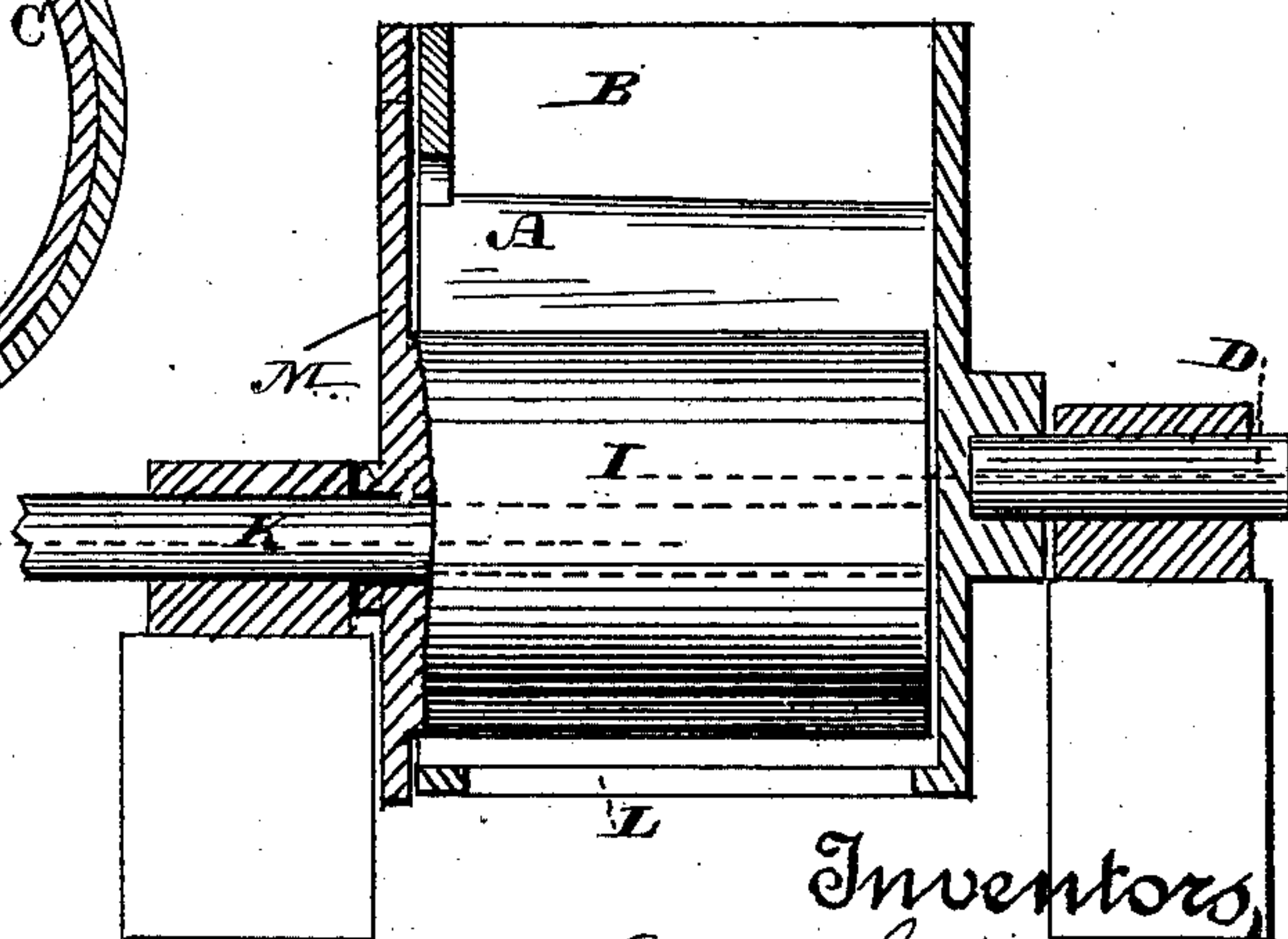


FIG. 3.



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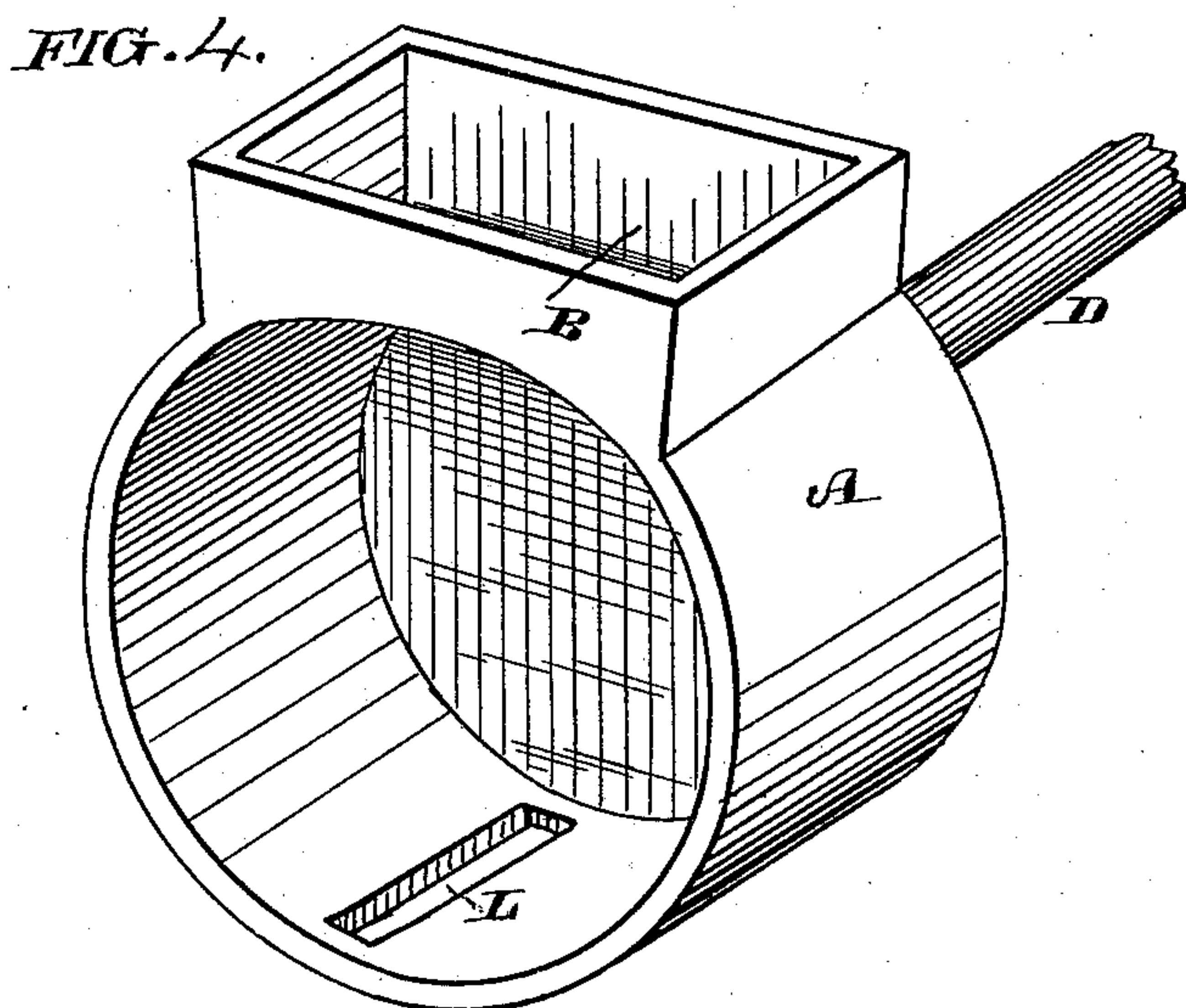
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UNITED STATES PATENT OFFICE.

AARON G. DYER AND JAMES M. DYER, OF SAN FRANCISCO, CALIFORNIA.

ROCK CRUSHER AND PULVERIZER.

SPECIFICATION forming part of Letters Patent No. 311,235, dated January 27, 1885.

Application filed November 5, 1883. (No model.)

To all whom it may concern:

Be it known that we, AARON G. DYER and JAMES M. DYER, of the city and county of San Francisco, and State of California, have
5 invented an Improvement in Rock Crushers and Pulverizers; and we hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to a machine for crushing and pulverizing rock; and it consists in the construction and combination of devices, to be hereinafter more fully set forth, and specifically pointed out in the claims.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a perspective view of the crusher and pulverizer. Fig. 2 is a section transverse to the receiver and cylinder. Fig. 3 is a longitudinal vertical section taken through the
20 line of the axis of the receiver and cylinder. Fig. 4 is a detail in perspective of the receiver.

A is a cylindrical receiving and crushing chamber, which may have a hopper-shaped opening, B, at the top, through which the rock to be crushed is introduced. This chamber or receiver A is closed at one end, and is made strong enough to resist the pressure of the material which is to be crushed, and the receiver is supported upon a shaft which is above the line of the cylinder-shaft K, as will be hereinafter more fully explained. The interior of the receiver is preferably lined with dies C, which may be made in sections, so as
35 to be removed or replaced by others in case of wear or breakage, and a shaft, D, extending out horizontally from the closed end of the receiver, turns in suitable boxes and supports the receiver, to which it is eccentrically secured.
40

From the closed end of the receiver A an arm, E, extends upward, and forms a lever, to which power is communicated to oscillate the receiver to and fro. This movement will
45 bring the sides of the receiver in closer contact with the cylinder I, and thereby reduce the rock, which moves downward between the two at each oscillation.

F is a connecting-rod; G, an eccentric or
50 crank fixed to a shaft, and H a pulley or gear

secured to the same shaft, to which power is applied in any suitable manner to move the parts.

Within the receiver is a cylinder, I, of sufficient length to just fit between the ends of the receiver, and considerably smaller than its inside diameter. This cylinder I may have an exterior shell, J, of hard iron, forming a crushing-shoe, which can be slipped off and replaced by another when it becomes too much
55 worn for further use. The cylinder I has the shaft K extending out through the open end of the receiver A, opposite to the shaft D, but at a point somewhat lower down, so that the two shafts are not in line, but mounted eccentrically with respect to each other. The shaft K is supported in boxes, so that it and the cylinder I are free to turn, and the receiver A has formed in its lower part an opening, L, through which the crushed material
60 may escape. A flange, M, is fitted to the end of cylinder I next to the open end of the receiver, and prevents the escape of the material at that point. The exterior of cylinder I lies so close to the bottom of the receiver A as to determine the size of the particles which may pass between the two, and the space upon each side of the central point gradually widens toward the top of the receiver, as shown. The cylinder-shaft K and shaft D turn in boxes or
65 bearings which are made adjustable vertically, so that the distance between the bottom of the cylinder and the bottom of the receiver may be changed to suit the degree of fineness required in the material crushed.
70 85

The operation of our device is as follows: Ore or material to be crushed, being fed into the receiver, will lie upon each side of and above the cylinder I, and when the receiver is caused to oscillate from side to side by power
75 90 applied as before described the material becomes wedged between the sides of the cylinder and the receiver, and as the receiver moves back and forth the cylinder I is caused to rotate in the same direction by reason of the
95 wedging of the rock between the two, and as the rock passes downward the sides of the receiver and cylinder approach each other and it is crushed. The rock on the opposite side will slip down into the widening space on that
100

side, to become in turn wedged between the cylinder and receiver and carried down and crushed by the return oscillation of the receiver. The rock is thus gradually carried
5 down and crushed until it reaches the narrowest space beneath the cylinder, from which it escapes through the discharge-opening L. By this apparatus we are enabled to gradually reduce rock or other material from large pieces
10 to a considerable fineness, so that little or no further crushing operation will be necessary.

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

15 1. In a crushing apparatus, a hollow receiver provided with a horizontal shaft and having the end opposite the shaft open, in combination with a cylinder of smaller diameter extending into the open end of the receiver,
20 and provided with a shaft journaled in a line below the shaft of the receiver, said receiver and cylinder being nearest together at the bottom, substantially as herein described.

2. In a crushing apparatus, an exterior receiver closed at one end and provided with a
25 hopper, into which ore may be fed at the top, a discharge-opening at the bottom, and a horizontal shaft extending from the closed end and journaled to support the receiver, and mechanism, substantially as described, by which
30 the receiver may be caused to oscillate, in combination with a cylinder of smaller diameter extending into the open end of the receiver, and provided with a shaft extending horizontally
35 from its end and journaled in a line below the axis of the first shaft, substantially as herein described.

3. In a crushing apparatus, the hollow receiver open at one end and provided with a
40 shaft extending horizontally from its opposite

closed end, said receiver having a feed opening or hopper at the upper side and a discharge-opening at the lower side, and mechanism by which it may be caused to oscillate
45 from side to side about its shaft, in combination with a cylinder of smaller diameter extending into the open end of the receiver, and having a horizontal shaft extending outwardly from its opposite end and in line below that
50 of the axis of the receiver, and a flange, M, extending outwardly around the edge of the cylinder, as herein described.

4. In a crushing apparatus, an oscillating cylindrical receiver closed at one end and provided with a horizontal shaft extending axially
55 from that end, a cylinder of smaller diameter extending into the receiver, and having a flange which extends outwardly to close the open end of the receiver, and a shaft extending horizontally outward from the opposite
60 end and in line below the shaft of the receiver, the lower side of the cylinder being near the bottom of the receiver, and adjustable boxes by which the shaft and the cylinder may be raised or lowered, as herein described.
65

5. The receiver A, having a feed-opening at its upper side and a discharge-opening at its bottom, and journaled, as shown, in combination with the internal cylinder, I, having the
70 flange M, and means, as described, whereby the cylinder may be raised or lowered, as and for the purpose set forth.

In witness whereof we have hereunto set our hands.

AARON G. DYER.
JAMES M. DYER.

Witnesses:

JOSEPH A. BAYLESS,
S. H. NOURSE.