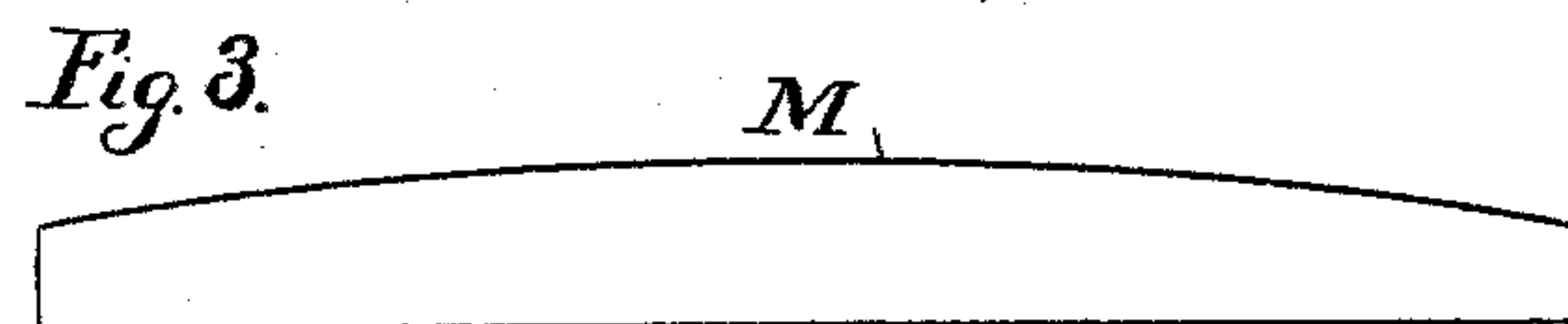
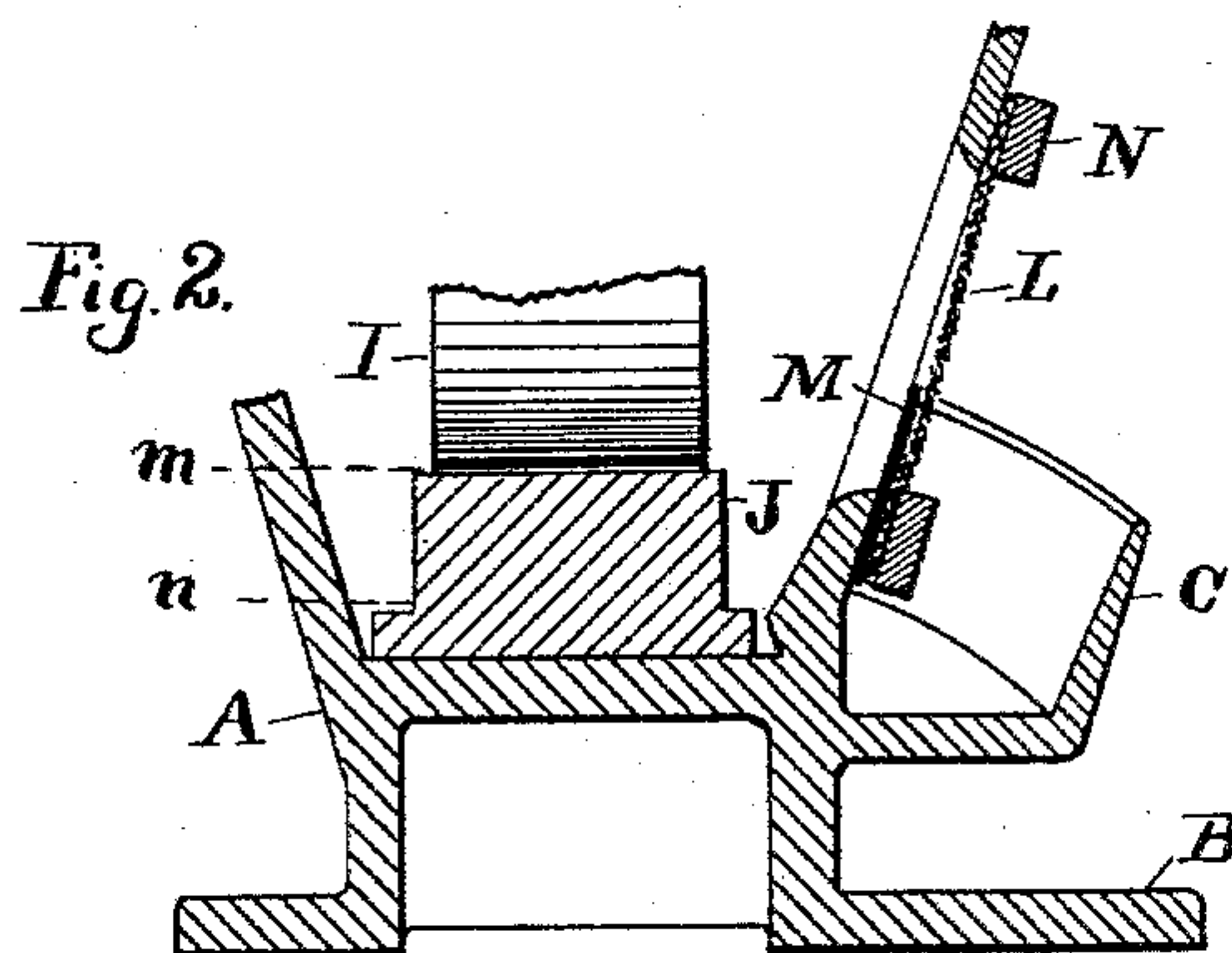
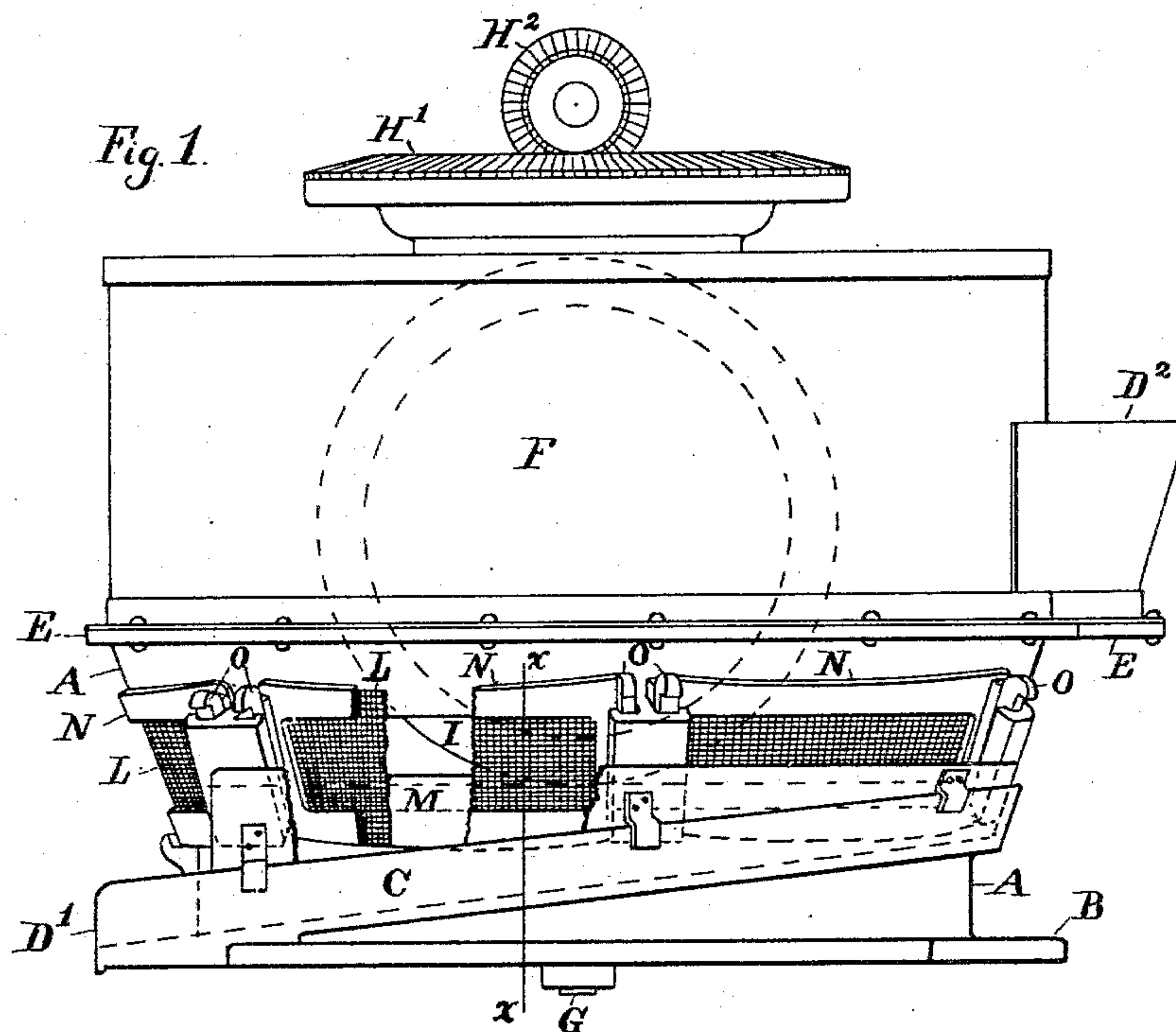


(No Model.)

G. JOHNSTON.
ORE CRUSHING MACHINERY.

No. 559,779.

Patented May 5, 1896.



WITNESSES:

Edw. S. Cobb.

Wilson D. Bent, Jr.

INVENTOR

George Johnston

BY

John Richards

ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE JOHNSTON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE
RISDON IRON AND LOCOMOTIVE WORKS, OF SAME PLACE.

ORE-CRUSHING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 559,779, dated May 5, 1896.

Application filed September 24, 1895. Serial No. 563,519. (No model.)

To all whom it may concern:

Be it known that I, GEORGE JOHNSTON, 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-Crushing Machinery; and I hereby declare the following specification and the drawings therewith to be a complete description of my improvement.

My invention relates to that class of ore-crushing machines wherein the crushing is done in a cylindrical and flaring vessel or pan by means of rollers or otherwise, and to an adaptation of the escape-screens to the varying height of the surfaces between which the ore is crushed, and to preserving the screens from destructive wear by abrasion of the uncrushed ore.

My improvement consists in flexible plates that can be bent around to fit the contour of the cylindrical flaring pan placed inside the perforated screens and adjustable up or down thereon, as may be required, the height of the die or die-ring, and in means to adjust and fasten such guard-plates in a proper position.

The main object of my invention is to protect the screens, which are fragile and expensive, from the unpulverized ore that is by action of the crushing-rollers and dies shoved out laterally against the screens in a plane corresponding to the top of the dies. There is also the object necessary in some cases of regulating the height and area of the discharge-surface with respect to the operation of the machine.

Referring to the drawings, Figure 1 is a side elevation of an ore-crushing machine provided with my improvements. Fig. 2 is an enlarged section on the line xx in Fig. 1, showing particularly the method of applying my improved guard-plates. Fig. 3 is a flat view of one of my improved guard-plates removed from the machine.

Like letters of reference indicate corresponding parts throughout.

The main vessel or pan A is cast with a base-flange B, a collecting-trough C, terminating in a spout D', and a flange E around the top, to which is fastened a cylindrical case F,

inclosing the crushing mechanism of the machine and provided with a feed-spout D².

The crushing-rollers I, two or more in number, are driven by a vertical shaft G, and this by means of gear-wheels H' H² in the usual manner.

The die-ring J is preferably made of steel and rests in a groove around the interior of the pan A, as shown in the section Fig. 2. These dies J when first prepared are nearly their width in depth, as seen in Fig. 2; but in use they are rapidly worn down by abrasive action of the ore, changing the crushing plane from the plane m down to n , so the relation to the bottom of the discharge-screens L is altered to that extent. In the plane m the broken uncrushed ore is shoved laterally by the rollers I, and if not interrupted impinges against the screens L, cutting or destroying them in this plane. To avoid this, I provide guard-plates M, made of thin metal, that can be laid on the inside of the screens L and temporarily fastened thereto in the required position. Then the screen L and its plate M are bent around to fit against the curved and flaring sides of the pan A, and fastened by the frames N and keys O in the usual manner.

When the die-ring J is worn down a sufficient distance to permit further exposure of the screens L, the frames N are removed, the screens L and guard-plates M taken out, and the latter fixed at a lower position, so following when required until the die-ring J is worn down to the plane n .

I am aware that it is common in the case of stamp-batteries to adjust the screens upward and downward to suit the position of the dies; but such adjustment cannot be employed in the class of machines to which my invention applies and which have hitherto been, so far as I know, operated without such provision to protect the screens.

Having thus explained the nature and objects of my invention, also the manner of constructing and applying the same, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the pan and die of an ore-crushing machine formed with screen-openings, of the screens covering said open-

ings, and the removable guard-plate adjustable to different heights as the plane of the die-ring may demand.

2. The combination with the pan and die of
5 an ore-crushing machine formed with screen-openings, of the screens, the screen-frames, and the adjustable plates, clamped and held by the screen-frames.

3. The combination with the pan and die of
10 an ore-crushing machine formed with screen-openings, of the screens, the screen-frames,

the inside guard-plate adjustable up or down, and the keys whereby the parts are removably held in place.

In testimony whereof I have hereunto af- 15
fixed my signature in the presence of two witnesses.

GEORGE JOHNSTON.

Witnesses:

ALFRED A. ENQUIST,
WILSON D. BENT, Jr.