

(No Model.)

D. BUSHMAN.

ROTARY CRUSHER.

No. 277,543.

Patented May 15, 1883.

FIG. 1.

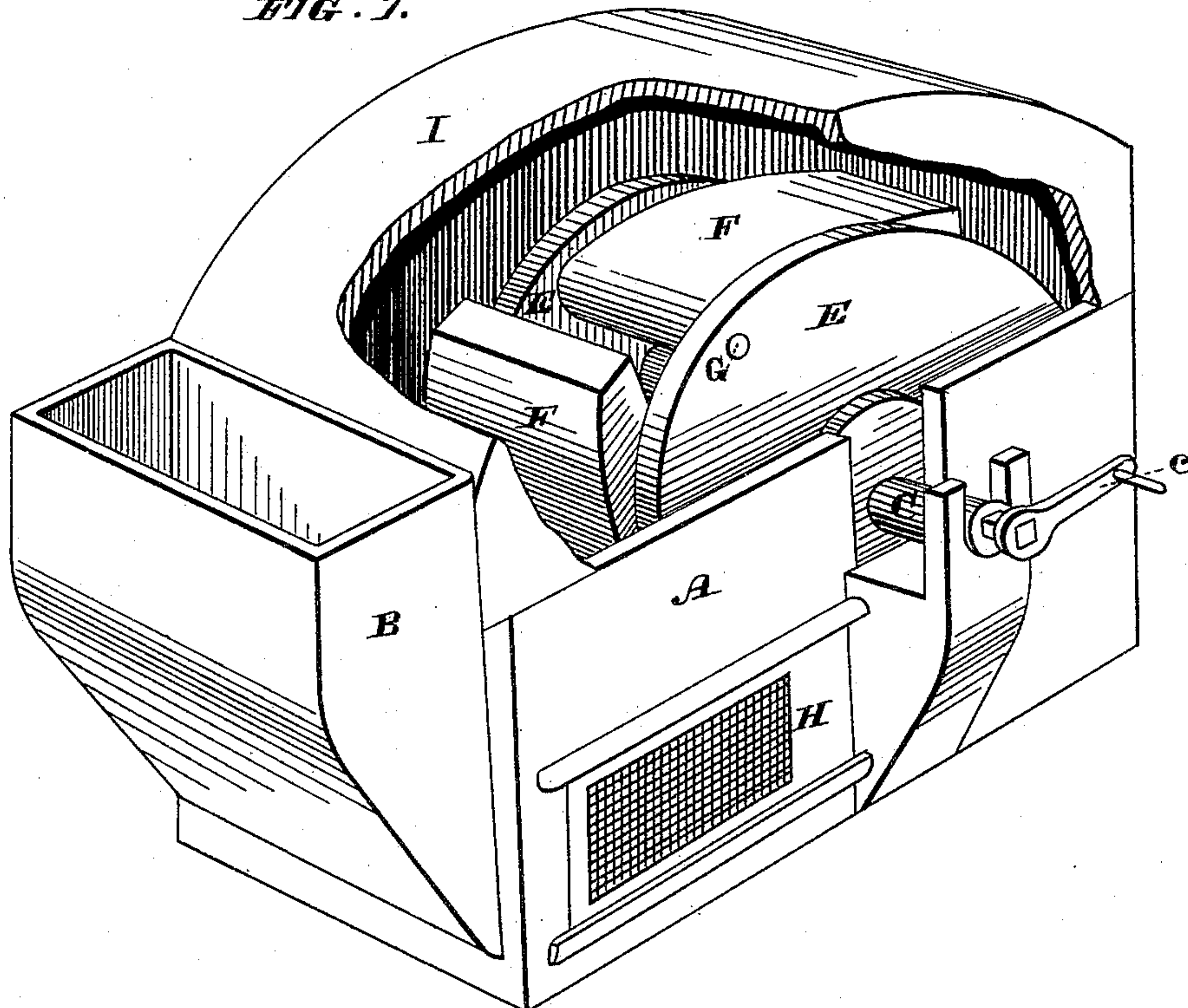
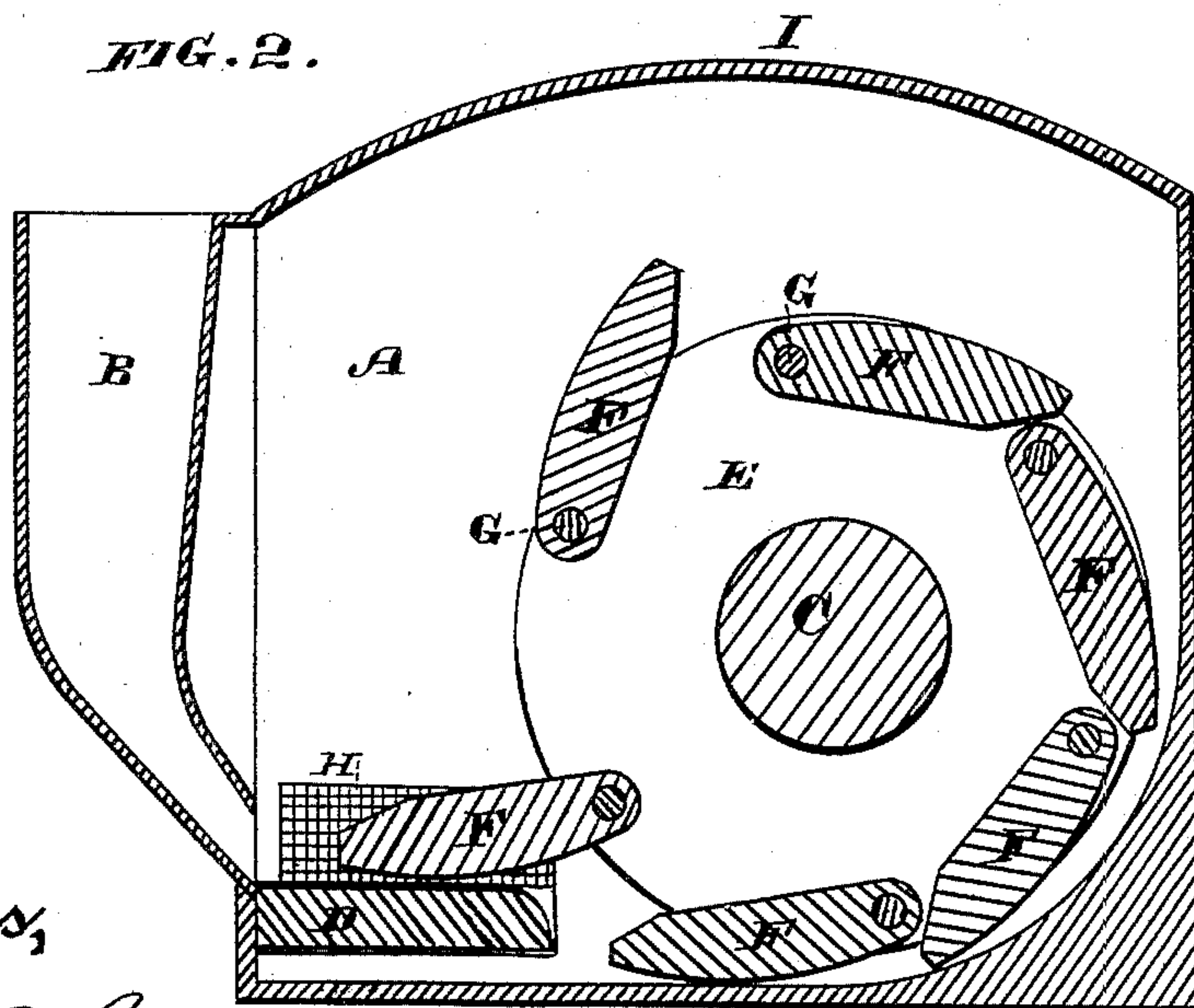


FIG. 2.



Witnesses,

Geo. H. Strong  
J. H. House

Inventor

David Bushman  
By Dewey & Co.  
Attorneys



# UNITED STATES PATENT OFFICE.

DAVID BUSHMAN, OF QUINCY, CALIFORNIA.

## ROTARY CRUSHER.

SPECIFICATION forming part of Letters Patent No. 277,543, dated May 15, 1883.

Application filed December 5, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID BUSHMAN, of Quincy, county of Plumas, State of California, have invented an Improved Rotary Crusher; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to a new and useful crusher for breaking and pulverizing rock, ore, quartz, cement, &c.; and it consists in certain details of construction and combination of parts, as hereinafter fully described, and particularly pointed out in the claims.

The object of my invention is to break, crush, and pulverize any substance in the working of which such operation is required; but the particular object I have in view is to crush ore, rock, and quartz for the purpose of extracting the precious metals therefrom.

Referring to the accompanying drawings, Figure 1 is a perspective view of my improved rotary crusher with cover broken away. Fig. 2 is a vertical longitudinal section.

A represents the casing or mortar, having at one end a hopper, B, through which ore is fed to the mortar. In the bottom of the mortar, near one end, is a die, D, here shown as set in grooves or recesses in the sides of the mortar, whereby it may readily be removed when worn and another inserted in its place. Mounted transversely in the mortar is a shaft, C, having a crank, c, as the means here shown to revolve said shaft. Rigidly secured upon the shaft within the sides of the mortar are two flanges or disks, E.

F F are the beaters. These are made with necessary weight, and are each pivoted between the disks E by bolts G, passing through said disks and through the bases of the beaters F. These beaters are pivoted at such distances apart that when turned down to lie between the disks the point of one shall just reach and rest upon the base of the other, thus economizing space and preventing blocking or clogging by the beaters. At the rear of the mortar the bottom and end are curved, and the peripheries of the disks move close to them, and at the other end of said mortar sufficient space is left to allow the beaters to be thrown out horizontally to strike the die D. In the

sides of the mortar, near its forward end, are the screens H, through which the pulp passes after being crushed by the beaters.

The operation of the device is as follows: Ore is fed to the mortar through hopper B. The disks E are revolved toward the hopper, and each beater, after it passes the center of gravity, falls forward and downward away from its place between the disks and strikes its blow upon the rock which lies between it and the die D. The continued revolution of the disks then draws the beater backward over the rock and die, grinding and pulverizing the ore it has just broken by its blow. The proximity of the disks to the bottom and rear end of the mortar causes the beater to return to its place between the edges of the disks and there remain until it has passed the center of gravity again, when it delivers another blow. This is the operation of each beater, and the rate of revolution of the disks determines the rapidity and force of the blows, the latter increasing with the speed as the centrifugal force becomes greater. The blow delivered upon and the subsequent dragging of the beater over the rock have a very beneficial effect in thoroughly disintegrating and reducing it to a fine pulp, which can be readily worked.

Any of the beaters may be easily removed by withdrawing bolts G, if it should be required; and the die may be replaced, when desired, by removing screen H, which slides in grooves, as shown in Fig. 1, and withdrawing the same endwise.

I am aware that ore-crushing devices in which a rotary wheel provided with fixed beater-arms is operated in a shell or casing have been heretofore known. I do not, therefore, claim, broadly, such a device; but

What I do claim as new, and desire to secure by Letters Patent, is—

1. The casing or mortar A having a curved rear end, and the removable die D in the bottom at its forward end, in combination with the disks or flanges E, a shaft therefor, the swinging beaters F F, pivoted through their bases between said disks or flanges, the point of one resting upon the base of another when mov-

ing into operation, and means for revolving said disks, substantially as and for the purpose described.

2. A crusher consisting of the mortar A, 5 having a curved rear end, cover I, and removable die D in the bottom and at its forward end, hopper B, screens H, shaft C, disks or flanges E, and the swinging beaters F F, pivoted through their bases between said disks

or flanges, the point of one resting upon the base of another when moving into operation, substantially as herein shown and described.

In witness whereof I hereunto set my hand.

DAVID BUSHMAN.

Witnesses:

G. G. CLOUGH,  
H. P. WORMLEY.