

J. W. PINDER.
STAMP MILL.
APPLICATION FILED OCT 3, 1910.

995,713.

Patented June 20, 1911.

Fig. 1

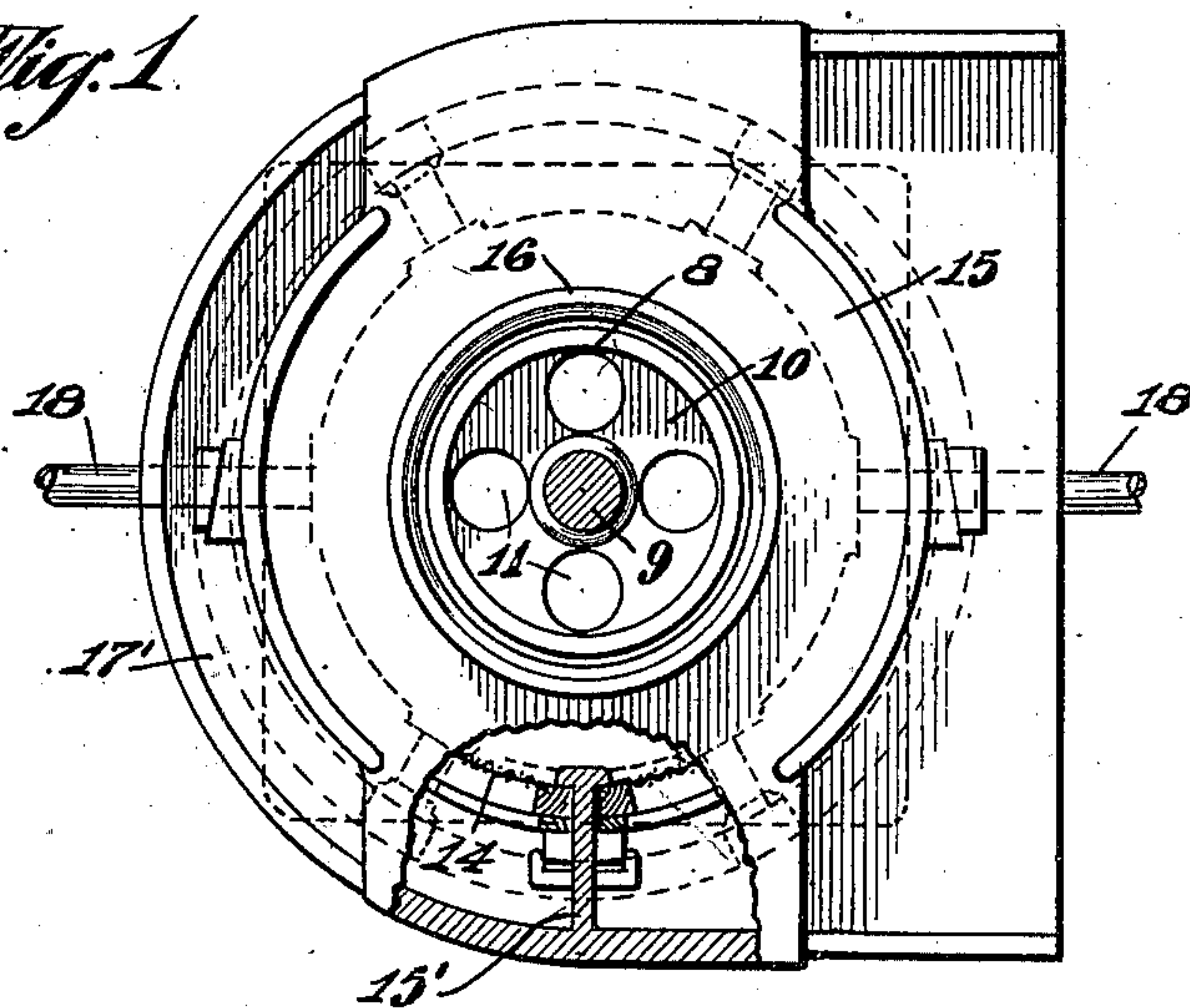
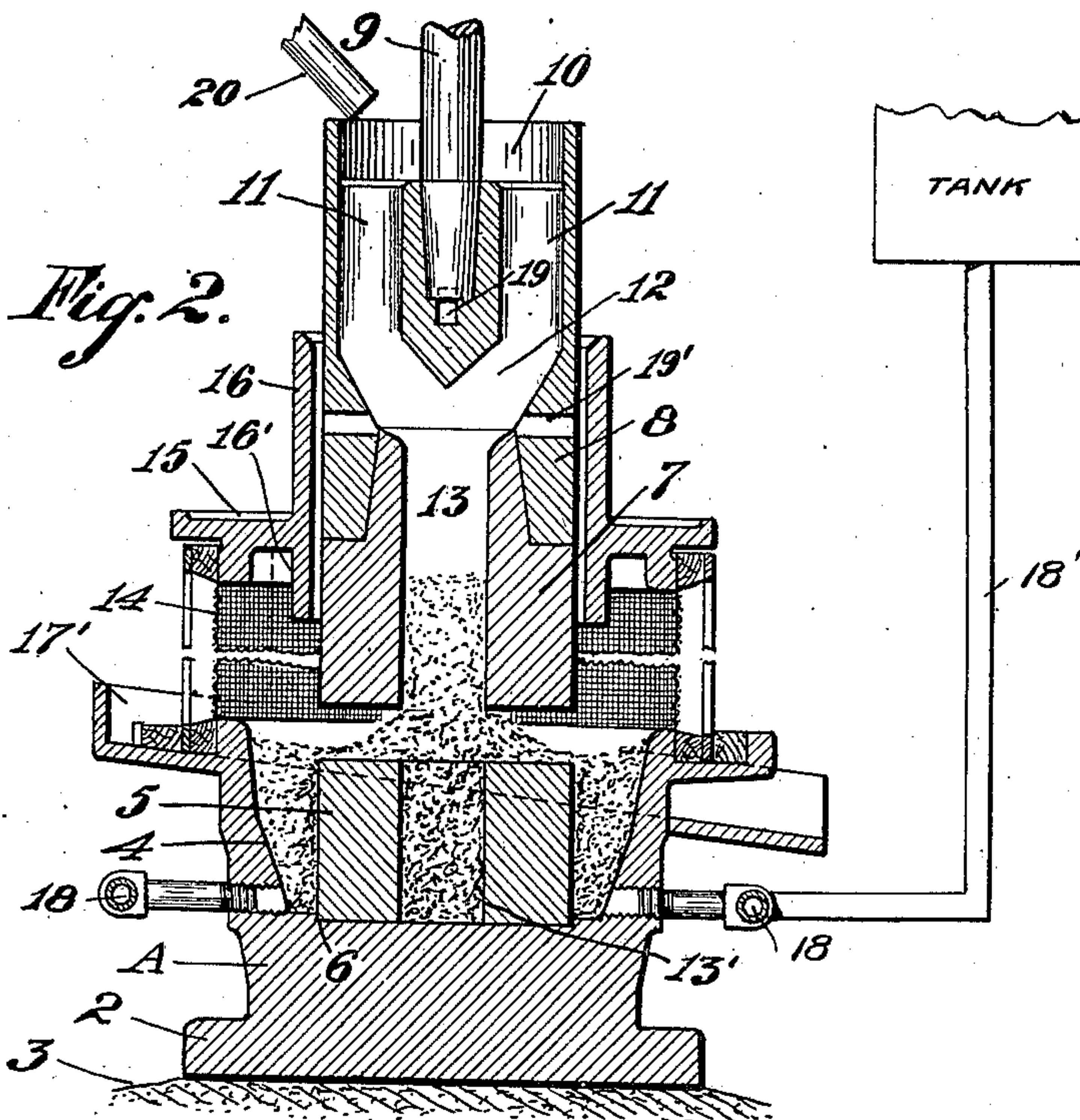


Fig. 2



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOSEPH W. PINDER, OF OAKLAND, CALIFORNIA.

STAMP-MILL.

995,713.

Specification of Letters Patent. Patented June 20, 1911.

Application filed October 3, 1910. Serial No. 584,970.

To all whom it may concern:

Be it known that I, JOSEPH W. PINDER, citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Stamp-Mills, of which the following is a specification.

This invention relates to an improvement in stamp mills such as are employed in crushing ores or rock to a fine pulp preparatory to treatment for the extraction of metals, and particularly pertains to an improvement in the construction of the various parts of which the mill is composed.

It is the object of this invention to provide a stamp mill which is substantial and durable in construction, and which is so designed that the materials being worked will be thoroughly ground or crushed and rapidly handled.

Another object is to provide a stamp mill in which the wear and strain on the shoe and die will be evenly distributed, thereby increasing the length of service of these parts.

The invention consists of the parts and the construction and combination of parts, as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a plan view of the invention. Fig. 2 is a vertical section illustrating the operation.

In the drawings, A is the base or pedestal of the mortar of my stamp mill, having a flange 2 which may be rigidly secured to any suitable foundation 3. A saucer-shaped receptacle 4, with outwardly flared sides, is formed on the base A and in which the die 5 rests; the lower edge of the inclined face of the receptacle nearly contacting with the base of the die which rests in a countersink 6 in the base A in such manner as to be maintained in a rigid position.

A shoe 7 wedged in the boss-head 8 which is fixed to the stem 9 constitutes the stamp and coöperates with the die member 5 to pulverize the ore. A hopper 10 is formed in the upper portion of the boss-head 8, from which a plurality of passages 11 lead downward and terminate in a single chamber 12 in the boss-head and below the stem. A centrally disposed passage 13 in the shoe 7 is adapted to communicate with the chamber 12 and to deliver the ore fed into the hopper on to the center of the die 5. A bore 13'

corresponding to the passage 13, and in continuation thereof, is formed in the die 5.

Fixed to the base A, and surrounding the chamber in which the stem acts, is a vertically disposed circular screen 14 through which the crushed material and splash from the shoe and die pass. A cover 15 is provided for the space above the screen, which cover is supported from the base A by cast standards 15' thereon.

16—16' are vertical upper and lower flanges on the cover 15 acting as a guide to the stem, and preventing the splash escaping from the mortar, except through the screen 14. The pulp and water passing through the screen is collected in an annular trough 17' formed integral with the mortar, from which it is discharged into any suitable receptacle. The water supplied to the mill is delivered to the receptacle 4 through a series of feed pipes 18 which pass through the base A at intervals around its periphery.

Slots 19—19' are provided in the boss-head 8 for the purpose of inserting a wedge or other means for disconnecting the stem 9 and shoe 7 respectively from the boss-head.

20 is a feed chute of any desired construction, through which the rock to be crushed is fed to the hopper space 10.

The stamp stem 9 is reciprocated by any suitable means, not necessary here to be shown.

In practice, the ore to be crushed is fed into the hopper 20, water being supplied simultaneously at the same point, if desired, and through the feed pipes 18. The ore, by reason of the intermittent revolving motion of the stamp, as it is reciprocated in the usual manner, is distributed within the hopper 10 and falls thence through the passages 11, 12 and 13. As the stamp is raised each time, the ore, after filling the bore 13', falls between the crushing faces of the die 5 and the stamp shoe 7. As the stamp falls, the ore is distributed evenly over the die 5, thus insuring thorough grinding and crushing. The crushed ore is thrown off the die by the rotating motion of the stamp and strikes the circular screen 14 from every direction; the finer particles passing through the screen, while the materials insufficiently pulverized tend to fall back between the crushing faces to be re-ground. The crushed ore held in suspension by the water, after passing through the screen 14, is collected in the

trough 17, from whence it is removed for further treatment for the extraction of metals.

The flow of ore into the stamp is regulated by any suitable means, provided usually in the chute 19.

It will be seen by this system that the stamp shoe and die wear evenly which insures fine grinding and increases the period of their utility. Uneven strains on the stems 9, which frequently cause them to break, are thus eliminated. The ore is crushed before leaving the die, and strikes the screens at perfect right angles in every direction. This promotes rapid discharge; everything going out as soon as crushed fine enough to pass the screen, causing much more rapid work by the stamp, and less sliming of the ores in the process of crushing. This system also eliminates the cutting and breaking of screens by the flying pieces of ore.

By introducing the water into the battery box through the pipes 18, as illustrated, under pressure, the crushed ore remaining in the mortar is not permitted to pack solid. It is constantly being loosened up by the water pressure and the free gold liberated by the process of crushing from the matrix sinks at once to the bottom of the mortar, and is thus prevented from being pounded too finely under the stamp. This system of water feed obviates the necessity of amalgamation in the battery, and is a most important improvement in stamp battery practice.

One object of the mortar construction is to obtain the largest possible capacity in a very small mill. This maximum capacity is dependent in large measure on the screen area. By the present construction I have an absolutely uninterrupted screen area throughout the complete circumference of the circle and from top to bottom of the screen, as there is nothing in the way of the splash. By a cylindrical screen the splash is practically radial and horizontal, and such splash as strikes the top of the screen is deflected inwardly sufficient to strike the depending splash flange carried by the cover; consequently, I am able to have my stamps sliding quite free and loose through the flanges. This loose sliding fit reduces friction and therefore requires less power to operate the stamps, does not interfere with the crushing force of the stamps, and also en-

ables the stamp to be easily taken out, repaired and replaced. Another point is that the hopper is directly on top of the boss-head, which latter is made cylindrical throughout its length, and the feed is directly down through this hopper.

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

1. In a stamp mill, a mortar having a base portion on which is supported integrally a saucer-shaped receptacle, a hollow die resting in said receptacle, a hollow shoe, a boss-head carrying the shoe, said shoe coöperating with said die, said boss-head of substantially cylindrical form throughout its length and having a hopper formed on its upper end, and said hopper having discharge passages down through the boss-head and communicating with the hollow part of the shoe to discharge axially upon the die, a cover for the mortar integral with and supported from the base, said cover having an annular flange depending into the mortar space, and a cylindrical screen extending completely around the shoe and die and spaced therefrom, the splash from said shoe and die having an uninterrupted passageway radially in all directions through the screen.

2. An improved stamp mill having in combination a mortar comprising a base portion and an integral saucer-shaped receptacle surmounting the same and having outwardly flared sides, a die in said receptacle, vertical standards rigid with the outer edge of the receptacle and a cover above the receptacle and rigid with said standards, said cover having a central opening and vertical flanges extending above and below the cover and forming extended walls for said opening, a continuous annular screen, through which screen the splash from the stamp can pass radially in every direction, a vertically operating stamp slidably guided through the flanged opening in the center of the cover, and means for feeding ore centrally through the stamp and onto the top surface of the guide.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH W. PINDER.

Witnesses:

JOHN H. HERRING,
F. E. MAYNARD.