No. 817,298. PATENTED APR. 10, 1906.

J. Y. BYERS & J. W. MYER.

ROCK CRUSHER.

APPLICATION FILED APR. 19, 1905.

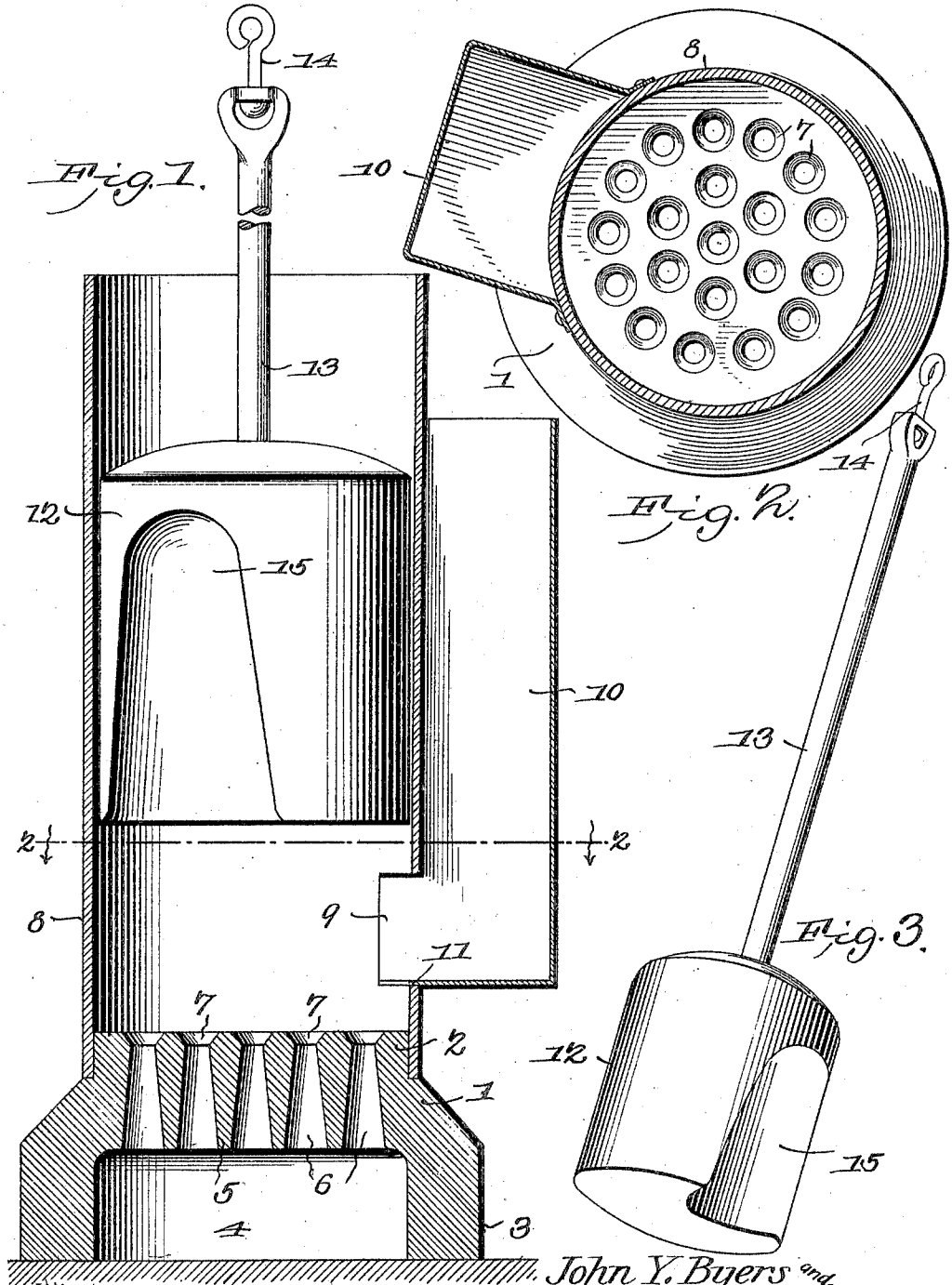


Fig. 1.

Fig. 2.

Fig. 3.

Witnesses:
E. F. Stewart
R. M. Elliott

John Y. Byers and James W. Myer, Inventors,
by C. A. Snow & Co
Attorneys.

UNITED STATES PATENT OFFICE.

JOHN Y. BYERS AND JAMES W. MYER, OF SAN DIEGO, CALIFORNIA.

ROCK-CRUSHER.

No. 817,298. Specification of Letters Patent. Patented April 10, 1906.

Application filed April 19, 1905. Serial No. 256,444.

To all whom it may concern:

Be it known that we, JOHN Y. BYERS and JAMES W. MYER, citizens of the United States, residing at San Diego, in the county of San Diego and State of California, have invented a new and useful Rock-Crusher, of which the following is a specification.

This invention relates to rock-crushers.

The object of the invention is to provide a simply-constructed, efficient, and durable machine of the class described, which in operation will be thoroughly effective to break and crush rock to the desired degree of fineness, in which any danger of the machine to become clogged will be obviated, and in which the crushed material that does not escape on one stroke of the stamp will be slightly agitated, thereby to cause it to be sifted through the openings in the bottom of the machine on a subsequent stroke.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists, generally stated, in a rock-crusher embodying in its construction a mortar or stamp-box, a pestle or stamp of peculiar construction coacting therewith, and a die having escape-openings of a configuration that will cause the rock to settle over the openings, and thus cause it to be properly crushed. The novelty of this part of the invention resides in the provision of a lateral recess of peculiar shape in the pestle into which the smaller particles of rock that do not escape on the downstroke of the pestle are caught and upon the upstroke of the pestle are allowed to drop, and thus be loosened up to cause them to be in condition to escape on a succeeding stroke of the pestle. The novelty of the die resides in the configuration of the escape-openings, which are truncated-cone shaped throughout the greater portion of their length and have their upper or smaller ends sharply countersunk to present rests or seats in which the pieces of rock will settle, thereby to insure that on a subsequent stroke of the pestle they will be forced through the openings to the escape.

The invention consists, further, in the various novel details of construction of a rock-crusher, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof.

In the drawings, Figure 1 is a view in sectional elevation of a crusher constructed in accordance with the present invention. Fig. 2 is a view in horizontal section, taken on the line 2 2, Fig. 1, and looking in the direction of the arrow thereon. Fig. 3 is a perspective detail view of the pestle or stamp.

Referring to the drawings, 1 designates the die or base of the crusher, which is preferably, as herein shown, circular in plan and provided with a reduced upper portion 2 and an enlarged lower portion 3. The under side of the die is provided with a chamber 4, forming thereby, in conjunction with the upper side of the die, an anvil 5, which is provided with any desired number of vertically-disposed orifices 6, preferably arranged in a circle. These orifices are cone-shaped and near their upper and smaller ends are sharply countersunk, as at 7, to present seats, in which the rock will rest, whereby upon the stroke of the pestle a proportion of the crushed rock and all of that over the openings will be forced through and escape to the chamber 4, and the reduced material may be removed in any preferred manner. The reduced upper portion of the die is engaged by a mortar or stamp-box 8, which may be combined with the base in any preferred manner, as by being bolted or riveted thereto, and as either form of connection may be employed particular illustration of any one form is omitted. The stamp-box may be made of any suitable material, preferably of wrought or cast iron, and of any desired height, and is provided at one side with a slot 9, which extends parallel with the face of the die and constitutes a feed-mouth, through which the material passes to the die. The material is fed down a feed-spout 10, which is bolted or otherwise secured to the mortar and extends to a point near the top thereof, the lower end of the spout being projected into the feed-mouth, as at 11.

The pestle or stamp, to which reference has been made, comprises a head 12, a stem or rod 13, combined with the head in any preferred manner and having at its upper end a swiveled eye 14, by which it may be con-

nected with any suitable lifting mechanism, (not necessary to be shown,) or, if preferred, as usual with machines of this character, a toe may be secured to the stem to be engaged by a tappet or lifter.

As above stated, one of the objects of the present invention is to lift and agitate the crushed material that fails to escape upon the stroke of the pestle, and this is effected by providing its head with a lateral recess 15, which extends from its under side to a point near its top and is provided with outward-curved walls, which insure the discharge of the material forced therein. The recess 15, which, in effect, constitutes a pocket, prevents an accumulation within the mortar of a mass of finely-divided rock, retained throughout an extended period during the operation of the machine, it being seen that the bulk of the material that fails to escape through the openings will be forced into this pocket and will upon dropping back upon the die be separated and scattered, and thus in condition to be forced through the openings at a subsequent stroke of the pestle.

In the operation of the machine rock of any suitable size is fed down the chute and falls onto the die, where it is immediately acted upon by the pestle, which reduces it to particles the fineness of which is determined by the size of the smaller end of the openings 6, these particles escaping through the openings into the chamber 4. The particles that are reduced, but do not escape through the openings, fly upward into the pocket, and as the pestle starts to lift are dropped back upon the die, where, as before stated, they either escape through the openings or are so positioned relatively to the openings as to insure their escape on a subsequent stroke or on subsequent strokes.

The connection between the stamp-box and die will, as above stated, be of detachable character, so that in the event of either part becoming useless from injury such damaged part may be readily replaced. The same is also true of the connection between the pestle-head and the stem.

It will be seen from the foregoing description that although the rock-crusher of this invention is exceedingly simple of construction it combines in a novel and practical manner all of the requisites essential to produce a thoroughly efficient machine, and, moreover, by reason of the peculiar construction of the pestle and the die that rapid and thorough granulation or reduction of the rock may be secured.

Having thus described the invention, what is claimed is—

In a machine of the class described, the combination with a die provided with cone-shaped escape-openings having their upper ends countersunk, of a mortar having a feed-chute in its side, and a pestle arranged within the mortar and provided on one side with a pocket all the walls of which are curved.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

JOHN Y. BYERS.
JAMES W. MYER.

Witnesses:
P. T. VERNON,
A. B. YATES.