(No Model.)

W. L. IRELAND & P. R. STANHOPE.

ORE CRUSHER AND SIZER.

No. 449,096. Patented Mar. 24, 1891.

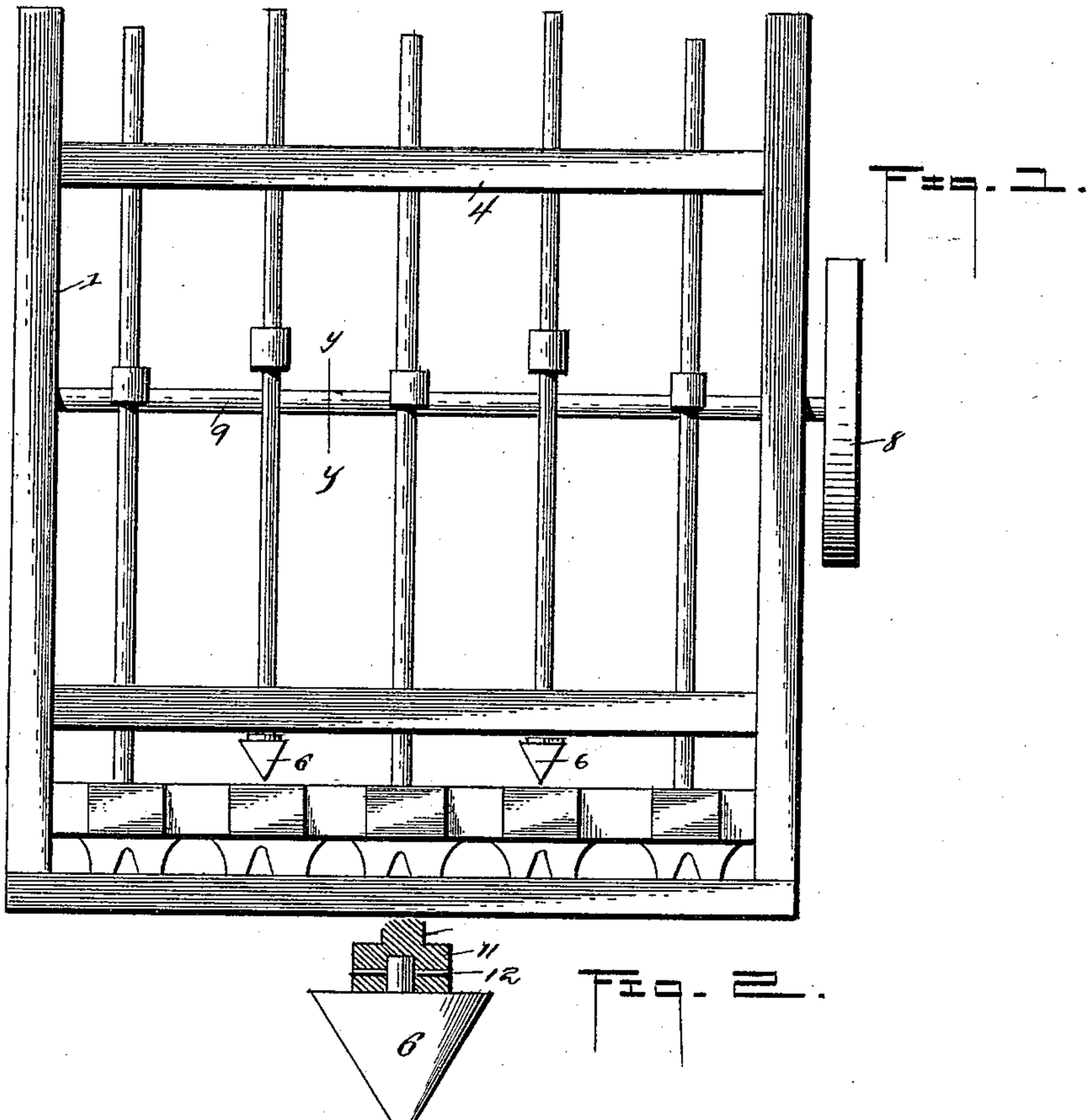

Fig. 2.

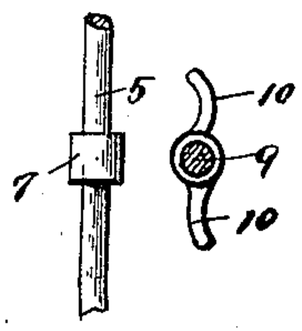

Fig. 5.

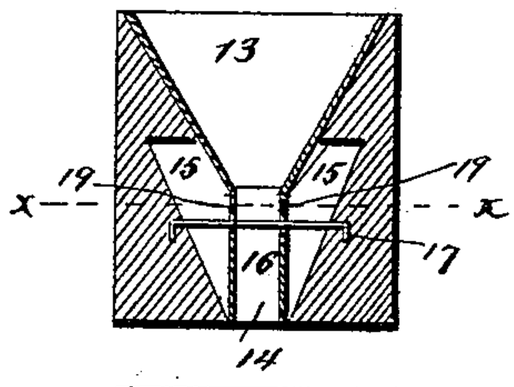

Fig. 3.

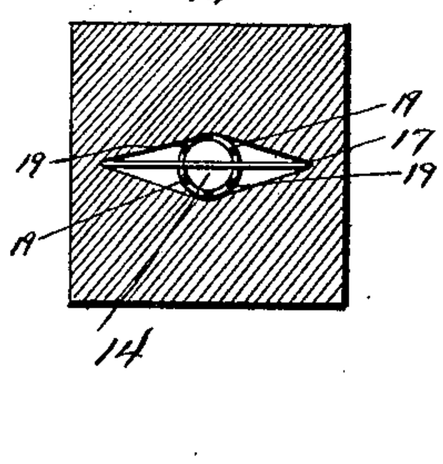

Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM L. IRELAND AND PHILIP R. STANHOPE, OF DUMONT, COLORADO.

ORE CRUSHER AND SIZER.

SPECIFICATION forming part of Letters Patent No. 449,096, dated March 24, 1891.

Application filed July 14, 1890. Serial No. 358,764. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM L. IRELAND and PHILIP R. STANHOPE, both citizens of the United States of America, residing at Dumont, in the county of Clear Creek and State of Colorado, have invented certain new and useful Improvements in Ore Crushers and Sizers; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a new and improved form and construction of a device for stamping, crushing, and sizing ores, metal-bearing rocks, and other solid substances.

Among the principal objects in view with reference to my improved device is to produce a stamping-mill of the class stated which, while being adapted to stamp, crush, and disintegrate the mineral or substance operated upon to fragments, shall also be so arranged and constructed as to render this work more speedy than in those mills of ordinary construction. Provision is also made in my improved device for the grading, graduation, or sizing of the comminuted or triturated mineral, the general arrangement being such that as the mineral or material operated upon is gradually disintegrated to the proper degree of comminution of trituration it is removed from the trough or box, thereby preventing the device from becoming clogged or choked up, and at the same time allowing such material only to escape as has been reduced to the proper degree of fineness.

It may be well to note here that while the device is of comparatively simple and economical construction it is reliable and durable in use and highly efficient for the purpose intended.

To these ends the invention consists of the features, arrangements, and combinations more particularly hereinafter described and claimed.

In the accompanying drawings is illustrated an embodiment of my invention, wherein Figure 1 is a side elevation of a stamp-mill provided with my improvement; Fig. 2, a view of one of the cone-shaped heads of the stamps, the connection of said head with the stamp-rod being shown in section; Fig. 3, a vertical section of one of the sockets or mortars in which the stamp-head falls; Fig. 4, a transverse section on line *x x*, Fig. 3. Fig. 5 is a section of the main propelling-shaft shown in Fig. 1, said section being taken on line *y y*, Fig. 1, and showing the cams of said shaft.

Referring now to these views, the reference-numerals 1, 2, 3, and 4 designate the frame-work in which the stamps and operating mechanism are mounted. The stamps, as herein referred to, consist of bars 5, to the lower extremities of which are secured the cone-shaped heads 6. Bars 5 occupy a vertical position and are slidingly secured in pieces 3 and 4, the arrangement being such as to give said bars a free vertical movement in their supporting-frame. On each of bars 5 is rigidly secured a collar or shoulder 7, the height of said collars on their bars being in or about in a horizontal plane with shaft 9. Shaft 9 is journaled within the frame-work at a suitable distance from bars 5, and is provided with a belt-pulley 8, rigidly secured thereto, while on said shaft and at intervals corresponding with the distances apart of bars 5 are rigidly secured cams 10. These cams 10 are so adjusted that by revolving pulley 8 shaft 9 rotates, causing cams 10 to engage shoulders 7 and elevate bars 5, when by the disengagement of collars or shoulders 7 with the cams 10 in the course of the revolution of shaft 9 the bars are permitted to fall.

Rigidly secured to the lower extremities of bars 5, as aforesaid, are the heads 6. The manner of securement of said heads to the bars is herein shown as typical of any approved means, and consists of inserting a projection 11 in a socket made in the lower extremity of bars 5, a pin 12 passing therethrough and through bar 5, thereby holding the head firmly and securely in position. Heads 6 are removably secured to bars 5 and may be detached by removing pins 12. Thus it will be seen that an injured or worn-out head may be readily and at small cost replaced by a new one. The head 6, which is preferably cone-shaped, is adapted to fit in a corresponding socket or mortar 13, extending from the apex of which is the outlet 14, said

outlet being provided with suitable openings 19 to permit the admission of water from pocket 15 to said discharge-passage 14.

In each of sockets 13 and below the lower portion of the cone-shaped portion thereof are cut one or more wings or pockets 15, the shape or contour of said pockets or wings being substantially such as that shown in Figs. 3 and 4. The object of these pockets is to allow water to work therein during the operation of the machine, and thus facilitate in forcing the finely-comminuted material out through aperture 14, thereby preventing or aiding in preventing the machine from becoming clogged.

Extending across aperture or outlet-opening 14 and across wings or pockets 15 is a dividing-bar 16, the extremities thereof resting in notches made in the walls of the socket, as at 17. This also aids in grading the mineral passing through outlet-opening 14 and retains in the socket all that is not sufficiently disintegrated to pass therearound.

To facilitate in the removal of the comminuted material from the outlet-openings 14 and prevent it from piling up and clogging the machine, and to give the water flowing therethrough better action on the same, cone or pedestal shaped pieces 18 are placed directly beneath outlet-openings 14, so that as the material falls thereon it is divided, thereby giving the current of water passing therethrough better access to the material it is desired to remove.

Having thus described my invention, what I claim is—

1. In an ore stamp-mill, stamp-bars supported in a suitable frame and provided with heads 6, removably secured thereto, sockets or mortars within which heads 6 are adapted to fit, said sockets being provided with outlet-opening 14, wings or pockets 15, cut in the walls of said sockets 13, communicating with said opening 14, and means for alternately raising and releasing bars 5, substantially as described.

2. In an ore-crusher, the stamp-bars 5, provided with heads 6, suitably secured in a frame-work, sockets 13, provided with wings or pockets 15, outlet-opening 14, bar 16, extending across socket 13, wings 15, pieces 18, placed beneath outlet-opening 14, and suitable means for alternately raising and releasing bars 5, substantially as described.

3. In an ore crusher and sizer, the stamp-bars 5, provided with conical heads 6, suitably secured in a frame-work, sockets 13, fashioned to receive heads 6 and provided with one or more wings or pockets 15 communicating with outlet-opening 14, centrally located, and suitable means for alternately raising and releasing bars 5, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

WILLIAM L. IRELAND.
PHILIP R. STANHOPE.

Witnesses:
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