(No Model.)

H. M. CORNELL.

ORE CRUSHING MILL.

No. 247,170. Patented Sept. 20, 1881.

Fig. 1.

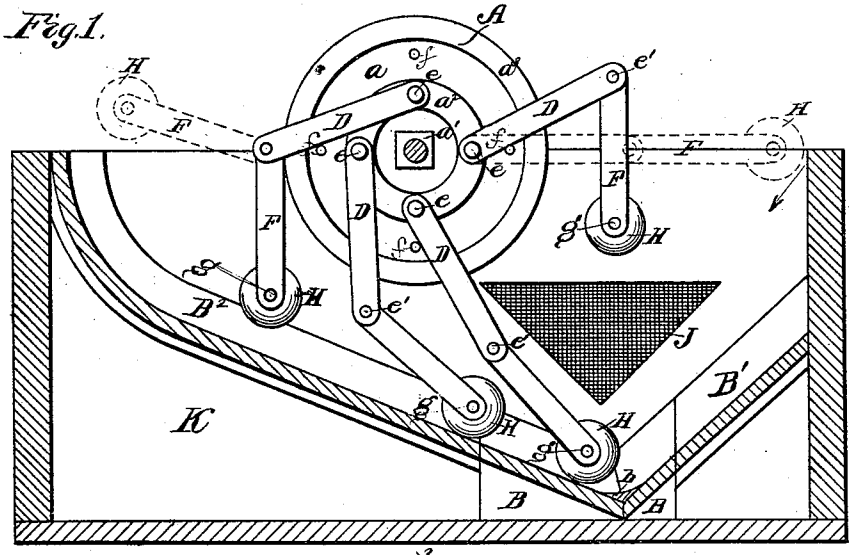
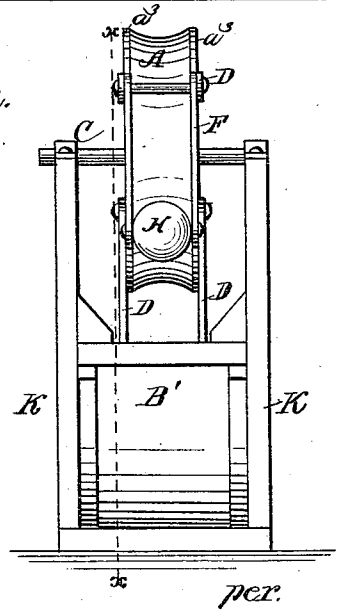


Fig. 2.



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UNITED STATES PATENT OFFICE.

HENRY M. CORNELL, OF CORNELL, ILLINOIS.

ORE-CRUSHING MILL.

SPECIFICATION forming part of Letters Patent No. 247,170, dated September 20, 1881.

Application filed December 8, 1880. (No model.)

To all whom it may concern:

Be it known that I, HENRY M. CORNELL, of Cornell, in Livingston county, of the State of Illinois, have invented a new and useful Improvement in Quartz, Ore, or Rock Crushing Mills, of which the following is a specification, reference being had to the annexed drawings, and the letters and figures marked thereon, forming a part thereof.

My invention pertains to a quartz, ore, or rock crushing mill, the chief peculiarities of which consist of a rotary wheel provided with a series of five (more or less) radial swinging arms, sub-arms, and hammers, and of a curvilineal ore-bed inclosed in a case provided with a perforated exhaust, the armed wheel being arranged and journaled above the ore-bed in such a position that the hammers will strike the ore upon the anvil.

The object of my invention is to provide a mill for crushing quartz, ore, or rock effectively.

In the drawings, Figure 1 is a side elevation of my said invention, showing one of the sides of the case removed; and Fig. 2 is a front-end elevation thereof.

Letters of like name and kind refer to like parts in each of the figures of the drawings.

I will now proceed to describe more fully my said invention, for the purposes of enabling others ordinarily skilled in the art thereto appertaining to make and use the same.

In my said invention the wheel A, consisting of a hub, a', and a skeleton body or two vertical parallel flanges with a space between, or, preferably, a solid body, as shown in the drawings, is arranged directly above the ore-bed B upon substantial bearings or supports C, to which it is securely journaled. The bearings or supports C are rigidly and substantially secured to the ore-bed B, which may be done in any suitable manner; or, if preferred, the bearings or supports C may be an independent frame. The wheel A may be made of iron or other suitable metal, or of a combination of metal and wood, as is shown in the drawings, in which the hub a represents metal and the body a' represents wood, the sides of which are faced with plate metal at a'' and a'''.

The radial swinging arms D are at one end secured or hinged to the wheel A, at points as near the hub a as practical, by means of substantial steel bolts e, which are inserted through the body and plates a'' of the wheel. The bolts f, which are inserted through the body and plates a''' of the wheel (in like manner as the bolts e) as near as practicable to the periphery, are for the purpose of supporting the arms and their appendages when in certain positions. If the wheel be solid, the arms D are in pairs, one of the pairs being hinged on the one and the other on the other side of the wheel. If of two flanges, the arms may be in pairs or single. If in pairs, they may be hinged either to the outer or inner side of the flanges, and if single, they must be hinged between the flanges; but in either construction of the wheel or arms the latter are attached to the wheel by the bolts e and supported by the bolts e' or their equivalents.

To the free end of each arm or pair of arms D is hinged, by means of bolts e' or their equivalents, a pair of sub-arms, F, which are pendent from and swing upon the arm or arms D, and to the free end of pair of sub-arms F is journaled, by means of a steel bolt, g, or the equivalent thereof, a hammer, H, of a globular or other suitable shape, which rotates upon its bearings.

The ore-bed or anvil B, consisting of a block of cast-iron or steel of sufficient thickness to bear the successive strokes of the descending hammers at their greatest momentum, is situated below and forward of the periphery of the wheel at a point where the hammers strike the ore with the greatest force. Longitudinally the upper surface of the ore-bed or anvil B inclines divergently from an obtuse angle, b, at a point near its forward end. The incline forward of the angle b is at a greater angle than is the opposite incline. Transversely it is concave, which may be of any suitable curve. The ore-bed or anvil B has a forward extension, B′, prolonged to a line perpendicular to and terminating at a point a little outside of the greatest radius of the hammers. When on a line horizontal to the arms of the wheel and rearward it has an extension, B″, prolonged beyond the periphery of the wheel to a distance sufficient to allow the pendent hammers to ascend without obstruction. The extensions B′ and B″ are the same in incline and concavity as the anvil B,

excepting that the rear extension, B″, terminates in an upward curve. The said extensions B′ and B″ may be made of wrought or cast iron or of steel.

The ore-bed or anvil B, with its extensions B′ and B″, is substantially inclosed in a metallic or wooden case, K, of any suitable construction, which case is at one of its sides provided with a perforated educt, J, of perforated metal plate or netting. The water may be inducted at any suitable point at the rear and the ore supplied at the front end of the apparatus.

In operating my said quartz, ore, or rock crushing mill, any suitable power may be used to rotate the wheel, which must rotate at a sufficient velocity to carry the hammers by their momentum to a radius of the full extension of the arms D and F, and for the purpose of increasing the capacity of the mill a series of armed wheels may be mounted upon the same shaft and operated by the same power.

It is apparent that in constructing the hereinbefore shown and described mill for use it must be made of the most substantial and sufficient material to give it the required strength to endure the strain and concussion incident to its operation.

Having thus described the said apparatus, I do not claim as my invention, in an ore-mill, the combination of a central shaft, arms, sub-arms, and hammers by itself, knowing that a similar combination has been heretofore produced—for instance, in patent issued to J. C. Senderling, (mills, ball, and drum,) dated December 3, 1878, No. 210,471. Neither do I claim as my invention, in an ore-mill, the combination of a wheel with arms, sub-arms, and hammers and anvil by itself, as a similar combination is also old—as, for instance, in patent issued to Shaw, (ore-stamps,) dated July 3, 1866, No. 56,108; but

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

In combination with a wheel, A, provided with a series of radially-swinging arms, D, sub-arms F, and hammers H, the ore-bed or anvil B, provided with extensions B′ and B″, constructed and arranged in relation to each other substantially as described, and for the purpose set forth.

In witness whereof I have hereunto set my hand this 1st day of December, A. D. 1880.

HENRY M. CORNELL.

Witnesses:
DANIEL STONER,
LEE H. CRUMB.