H. GEBHARDT.

QUARTZ-CRUSHING MACHINE.

No. 193,503. Patented July 24, 1877.

Fig. 1.

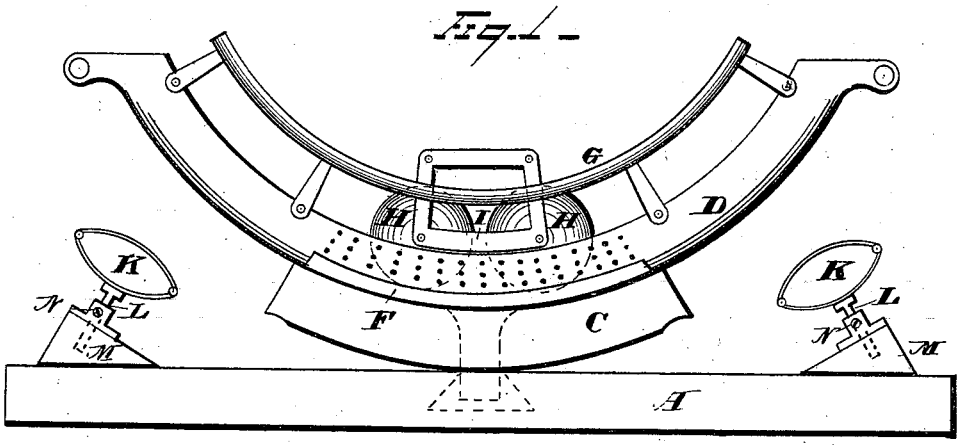


Fig. 2.

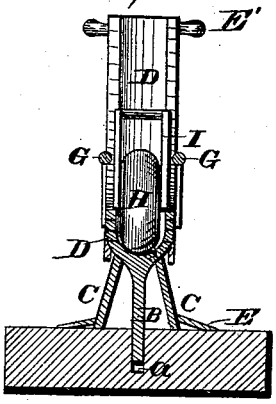
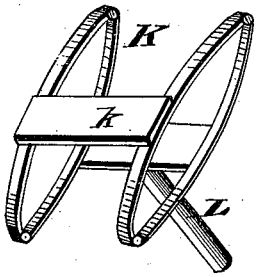


Fig. 3.



WITNESSES

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HENRY GEBHARDT, OF SILVER CITY, MONTANA TERRITORY.

IMPROVEMENT IN QUARTZ-CRUSHING MACHINES.

Specification forming part of Letters Patent No. **193,503**, dated July 24, 1877; application filed March 3, 1877.

To all whom it may concern:

Be it known that I, HENRY GEBHARDT, of Silver City, in the county of Lewis and Clark and Territory of Montana, have invented certain new and useful Improvement in Quartz-Crushing Machines; and I hereby declare that the following is a full, clear, and exact description thereof, which 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to quartz-crushing machines, having for its object a device that can be cheaply constructed, readily portable from place to place, capable of easy manipulation, and also adapted to receive its power application from the hand of the operator instead of necessitating steam mechanism as the actuating medium.

My invention consists, first, in a centrally-pivoted rocking frame, in combination with side reaction springs for aiding the operation of the former; second, in the rocking frame provided with a parallel bearing-piece for raising same above the supporting-bed, in combination with a stock or pivot for holding the crusher in place; third, in combination with the rocking-frame, one or more rollers for crushing the mineral, said rollers being actuated by gravity; fourth, the combination, with two or more rollers, and suitable connecting mechanism, of a frame, provided with a guard-rail and handles for manipulating the device.

In the drawings, Figure 1 is a side elevation of my improvement; Fig. 2, a vertical central cross-section; and Fig. 3, a detail view.

A is the supporting-frame or foundation part, having the conical-shaped aperture or slot *a*, in which works the central pivot or stock B, that portion of the latter within this slot being of constant area, while the slot itself, being of enlarged dimension from its top to base, allows of a reciprocal play of the pivot within the slot parallel to the length of the rocker. This pivot passes up through the bearing-piece C, and is secured to the central lower surface of the rocker D, the pivot having at its uniting-point an area larger than at any other part of its body. The bearing-piece C runs parallel with the rocker proper, and is of a height sufficient to raise the latter from the supporting-frame, and allow of suitable riffles or copper plates being attached to either side. Such riffles may be of any desired character, and connected to my improvement as best adapted to accomplish their ordinary purpose. Both in front and rear of the bearing-piece is a flanged toe or securing-block, E, whereby the tendency toward lateral play is obviated, and the rocker only allowed a forward and return movement in the plane of its longer dimension.

The main bed D of the crusher consists of an arc-shaped frame, provided with incasing sides for retaining the ore, and having at either extremity handles E′ suitable for manipulation in operating the device. Either side of the frame is perforated for a distance approximately commensurate with the length of the bearing-piece C, while below the perforations is hung an apron, F, one on either side, for catching the matter which percolates through the perforations above.

A guard-rail, G, borne upon standards projecting from the upper surface of the rocking bed, serve to guard the crushing-rollers as the same pass from one extremity of the bed to the other. The handles are secured to the ends of the rocking frame, said ends being extended out from the latter on a curved line, so as to obtain a leverage, thereby the easier to actuate the frame in its reciprocation.

The rollers H may be of any suitable construction and of weight adequate to thoroughly pulverize the ore as it is submitted to their crushing action. The two shown in the drawing are united by frame-work I secured to their respective axes, which serves to keep them in harmonious working, and prevent any closer engagement or shorter intervening distance.

These rollers may be hoisted in and out of the bed by crane or other appropriate mechanism, same not entering as a characteristic of my invention.

Elliptical springs K K are located in appropriate juxtaposition to the lower surface of the rocker, one on either side thereof, and secured to the foundation-support A by the con-

necting-shaft L engaging its one extremity with the lower leaves of the spring, while its opposite extremity is longitudinally adjustable in a bearing-block, M, attached to the floor-support A. Slots and engaging-pin N may be used to regulate the length of the connecting-shaft, or the latter may be tapped to screw into the block.

The detail view in Fig. 3 shows my preferable method of constructing the spring, two or more common steel springs being united by cross-plates *k* centrally secured to same, and to the lower of these plates is attached the adjustable shaft L.

The operation of the foregoing is as follows: The quartz to be milled or crushed is placed in its rough state within the rocking bed, water being added as is customary, and the rollers then started in their passage over the length of the bed.

An operator is placed at either one or at both ends of the frame, and by means of the handles E it is caused to oscillate backward and forward parallel with its length, thus causing the crushers to roll accordingly from end to end of the frame.

The contained ore is subjected to a crushing treatment by means of these rollers following their gravity tendency, as the bed is inclined either way, and thus passing over the mineral, pulverizing same, which latter, then mixing with the water, passes out through the perforations on either side of the bed-frame, and thence overflows the apron F, from which it passes to the riffles for final separation.

The same process is repeated upon new supplies of the ore, and the water, in connection with the rollers operated by the rocking-frame, pulverizes same, as before described. The side springs serve to give a reaction and impetus rebound to the frame as latter is brought down against either one, and thence returned to its opposite spring. The distance between the lower surface of the bed and either spring is determined by the adjustable shaft supporting same, and can readily be determined in practice.

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

1. A hand quartz-machine rocking on a central pivot, and provided with side reaction-springs, substantially as described.

2. In a quartz-crushing machine, the combination, with a rocking frame pivoted and supported from beneath, and containing the gravity-rollers, of the side reaction-springs, substantially as described.

3. The combination, with the arc-shaped rocking frame, provided with a parallel bearing-piece and guiding-pivot, of a supporting-floor, having a conical-shaped slot in which the pivot oscillates, substantially as described.

4. The combination, with the rocking frame provided with perforations, of the side aprons, substantially as described.

5. The combination, with the rocking frame operated by lever-handles, of the reaction-springs, adjustable in relation to the said frame, substantially as and for the purpose described.

6. The combination, with the rocking-frame provided with lever-handles, a guard-rail, and crushing-rollers rigidly attached to one another, and moving freely within said frame, of the side reaction-springs, substantially as described.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HENRY GEBHARDT.

Witnesses:
THOMAS J. LOWRY,
FRANK GEHRING.