F. M. DAVIS.

QUARTZ CRUSHER.

No. 183,648. Patented Oct. 24, 1876.

Fig. 1.

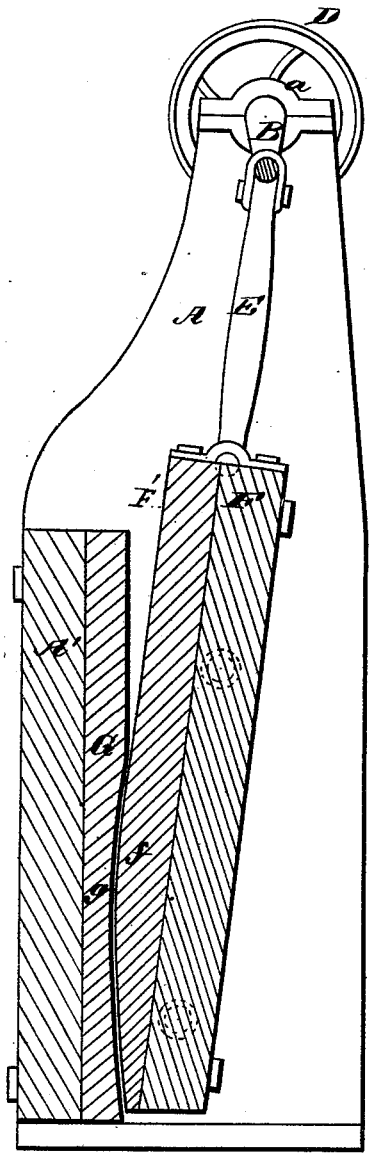
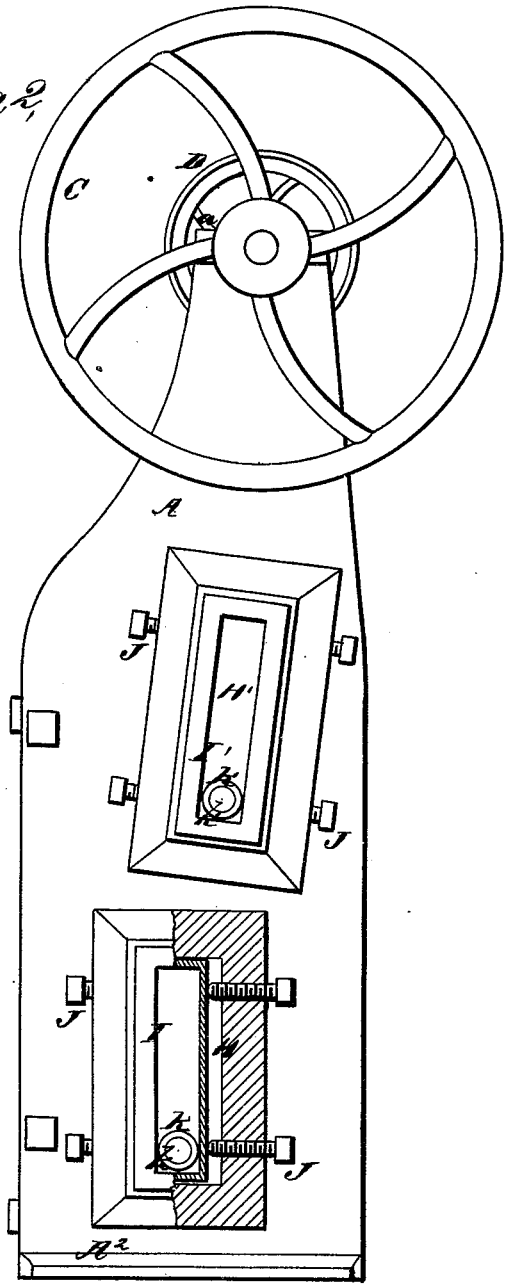


Fig. 2.



WITNESSES

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FRANCIS M. DAVIS, OF DENVER, COLORADO.

IMPROVEMENT IN QUARTZ-CRUSHERS.

Specification forming part of Letters Patent No. **183,648**, dated October 24, 1876; application filed July 29, 1876.

To all whom it may concern:

Be it known that I, FRANCIS M. DAVIS, of Denver, in the county of Arapahoe and State of Colorado, have invented a new and valuable Improvement in Quartz-Crushers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal vertical section of my quartz-crusher; and Fig. 2 is a side elevation, part sectional, thereof.

This invention relates to quartz-crushers; and it consists in certain improvements therein, as will be hereinafter more fully set forth.

In the annexed drawings, A designates one of the two standards which constitute, together with front piece or block A^1, the supporting-frame and box of the casing. On the tops of standards A, in boxes *a*, is journaled a rotating double-crank shaft, B, carrying a fly-wheel, C, and a belt-wheel, D, where the power is applied. Said double crank communicates vertically reciprocating and oscillating motion to a strong metal rod or pitman, E, the lower end of which is pivotally connected to a crushing-block, F. Said block is constructed with a face, F′, of chilled metal, which is plane from the top nearly to the middle, but convex at *f* from the middle to the bottom. G is a stationary crushing block or plate, also of chilled metal, and secured to front piece A^1. The face of crushing-block G is plane for part of the way down, and concave in its lower portion *g*. Concavity *g* and convexity *f* are made to fit one another.

Standards A A are each slotted at H and H′, the former slot being vertical, the latter inclined upward and backward. In said slots are set metal boxes I I′, somewhat narrower than said slots, so as to be capable of lateral adjustment therein, said adjustment being effected by means of adjusting-screws J J. The function of said boxes is to guide rigid gudgeons or trunnions K K, which slide therein. Said gudgeons are connected to and form a part of crushing-block F, and are provided with loose anti-friction sleeves *k k*, of Babbitt's metal or any other suitable material. By adjusting boxes I I′ backward or forward the distance between the tops of the crushing-faces may be increased or diminished at will. The crushing-plates F′ and G are made of chilled metal, and detachable from block F and front piece A^1, which should be of cast-iron or similar heavy and strong material.

In practice, the quartz is fed into the space between the tops of the crushing-plates as block F rises. When said block descends, the crushing-plate F′ grinds and crushes said quartz against plate G with a compound vertical and forward and back motion, due to pitman E, to inclined slot H′ and vertical slot H, and to the boxes I I′, secured in said slots. By adjusting the crushing-plates close together, their action is made more powerful, and the peculiar conformation of their lower portions makes it possible to thoroughly pulverize the quartz, as well as crush it, by the continuous operation of the same devices. The standards A A and the front piece A^1 must be made of thick and strong material, especially the latter, which is preferably of iron; and the joints are made close to prevent the escape of quartz, except at the bottom. Foot-pieces A^2 are attached rigidly to the standards A A, for the purpose of securing said standards in an upright position.

The above-described apparatus is applicable to crushing any kind of ores, coal, or stone as well as quartz.

Various modifications may be made without departing from the spirit of my invention. For instance, the reciprocating crushing-plate may be made concave, and the stationary one convex. Also, the means of adjustable boxes I I′ may be any known mechanical equivalent for screws J J. The crushing-plates may also be made in one piece with the blocks to which they are secured; and the double-crank shaft B may be operated by any suitable known mechanism.

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

1. The combination of standards A, having inclined slots H′ and vertical slots H, with crushing-block F and trunnions or gudgeons K K, substantially as and for the purpose set forth.

2. The combination of standards A, having inclined slots H′ and vertical slots H, provided with adjustable boxes I I, with crushing-block F and trunnions K K, substantially as and for the purpose set forth.

3. Trunnions K, provided with loose metal sleeves L, in combination with boxes I I′ and adjusting-screws J J, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

FRANCIS MARION DAVIS.

Witnesses:
H. C. ENSMINGER,
H. M. BEMIS.