C. W. STAFFORD.

2 Sheets—Sheet 1.

Quartz Crusher.

No. 52,765.

Patented Feb. 20, 1866.

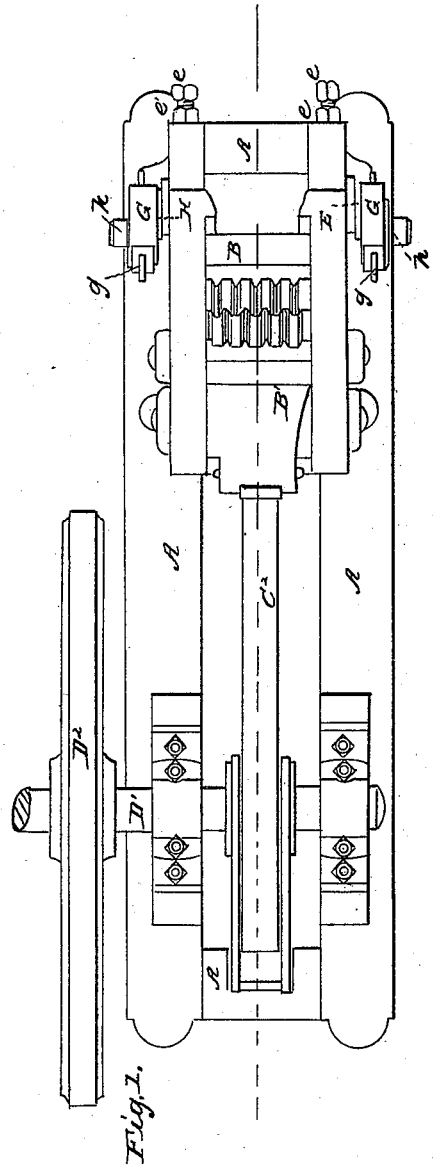

Fig. 1.

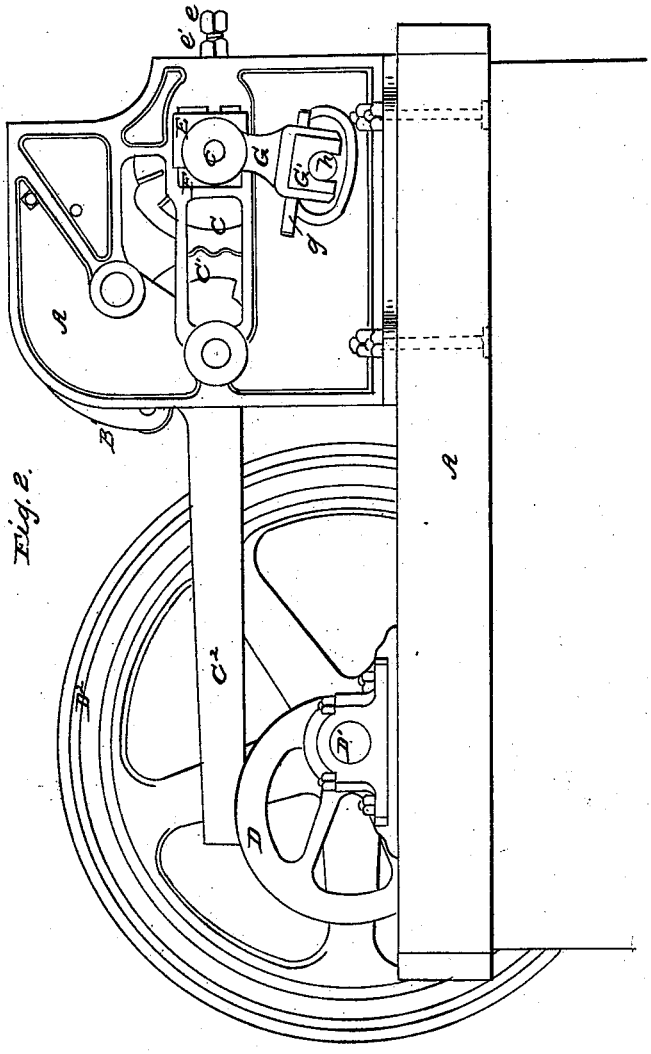

Fig. 2.

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Quartz Crusher.

2 Sheets—Sheet 2.

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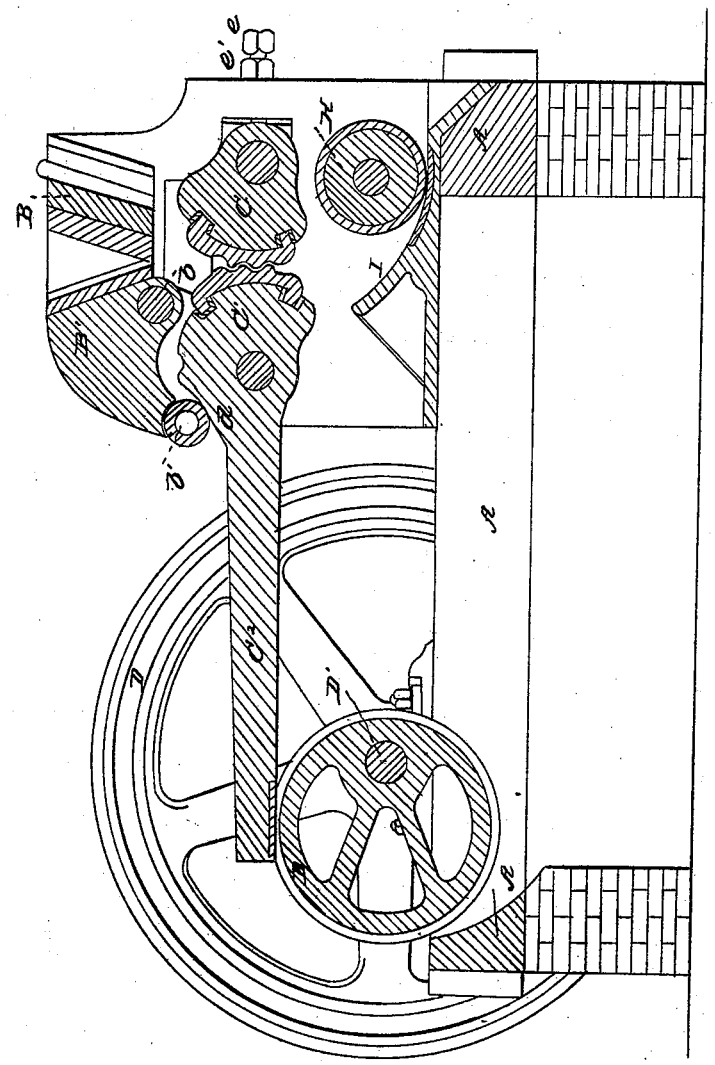
Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES W. STAFFORD, OF NEW YORK, N. Y.

IMPROVEMENT IN QUARTZ-CRUSHERS.

Specification forming part of Letters Patent No. **52,765**, dated February 20, 1866.

To all whom it may concern:

Be it known that I, CHARLES W. STAFFORD, of the city, county, and State of New York, have invented certain new and useful Improvements in Quartz-Crushers; and I do hereby declare the following to be a full, clear, and exact description of the nature, construction, and operation of the same, reference being had to the accompanying drawings, which are made part of this specification, in which—

Figure 1 is a plan of my improved quartz-crusher. Fig. 2 is a side elevation. Fig. 3 is a vertical longitudinal section of the same, the line *x x*, Fig. 1, indicating the plane of section.

Similar letters of reference indicate corresponding parts in the several figures.

In the machine, the subject of this invention, a stationary and a movable jaw are employed to break the large quartz-rock into smaller pieces, two vibrating jaws to crush and grind the quartz as it passes from the breaking-jaws, and a roller which moves over a segmental surface to pulverize the quartz as it is received from the grinding-jaws; and the motion of all the moving parts is derived from a single lever operated by a cam or equivalent device.

The invention consists in the method of combining, arranging, and operating the several parts.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe the same in detail with reference to the accompanying drawings.

A A represent the several parts of the framing of the machine; B, the upper stationary jaw, and B′ the upper movable jaw. These jaws B B′ are arranged relatively to each other in such a way as to leave an opening between them, into which the quartz is dropped.

The method of pivoting the movable jaw B is illustrated in Fig. 3, *b* being the pivot or fulcrum on which it is vibrated. This pivot *b* is located at the lower and inner angle of the jaw B′, so that when the jaw is moved forward it shall have also a slight downward movement, so that its action upon the interposed quartz is not positive or direct, but rolling or graduated. This rolling action is due to the method of locating the pivot *b*, and while the requisite crushing power is obtained the surfaces of the jaws are better adapted to remain unimpaired than when the action of the movable jaw is made positive and direct. In my machine the top of the face of the movable jaw has its movement limited to about three and one-sixteenth inches, while the movement at the bottom of the face is almost imperceptible. Hence as the operation proceeds the broken quartz passes unobstructedly from between the jaws B B′ at the lower end thereof, the faces of both jaws being ribbed, as represented. By thus arranging the jaw B it will be seen that the space at and between the lower ends of the jaws is always open, affording a free passage for the quartz, so that no choking can occur.

Below the jaws B B′, which are mounted within the upper part of the framing A, are two vibrating jaws, C C′, which work together in the manner shown, the faces of the jaws being corrugated the better to adapt them to crush and grind the quartz, the latter being received between them as it comes from the jaws B B′.

The jaw C′ is formed or cast in one piece, with a lever, C^2, which is vibrated in a vertical plane by a cam, D, fixed upon a shaft, D′, to which power may be applied through the wheel D^2. Near its juncture with the jaw C′ the lever C^2 is formed with an enlargement, *d*, which bears against a roller, *b′*, fitted in the tail or lower end of the jaw B′, so that as the lever is vibrated it moves the jaws B B′ as well as the jaws C C′. The roller *b′* is to avoid undue friction. The bearings E E of the jaw C rest in oblong openings F in the sides of the frame A, and, by means of screw-bolts *e e* and nuts *e′ e′*, said bearings may be adjusted at will to compensate for the wear to which the acting faces of the jaws are exposed.

The journals *c c* of the jaw C extend out through the sides of the framing, and are points of attachment for the upper ends of the arms G G, the lower ends of the latter taking hold of the arms or journals *h h* of the roller H, which is placed beneath the jaws C C′ and over the segmental surface or floor I. The journals of the jaw C, being rotated by the vibration of the jaw, communicate a vibratory movement to the arms G G, and the latter give a reciprocating movement to the roller H. This roller, moving over the floor I, pulverizes

the quartz which is received thereon as it falls from the jaws C C′.

The lower ends of the arms G G carry blocks G′ G′, which bear directly upon the arms of the roller H, and which may be adjusted as occasion may demand by means of wedges *g g*.

The motion of all the parts is derived from that of the lever C^2.

It is the intention to manufacture all the parts of Everett metal, a patent for which was granted June 27, 1865.

The machine has been tested practically and found to reduce the quartz with great expedition.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent:

1. The reciprocating roller H, in combination with the segmental surface or floor I, substantially as and for the purpose set forth.

2. The combination of the vibrating lever C^2, jaws B B′ C C′, and roller H, as and for the objects specified.

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