

Z. WHEELER.

Ore Crusher.

No. 53,066.

Patented March 6, 1866.

Fig. 1.

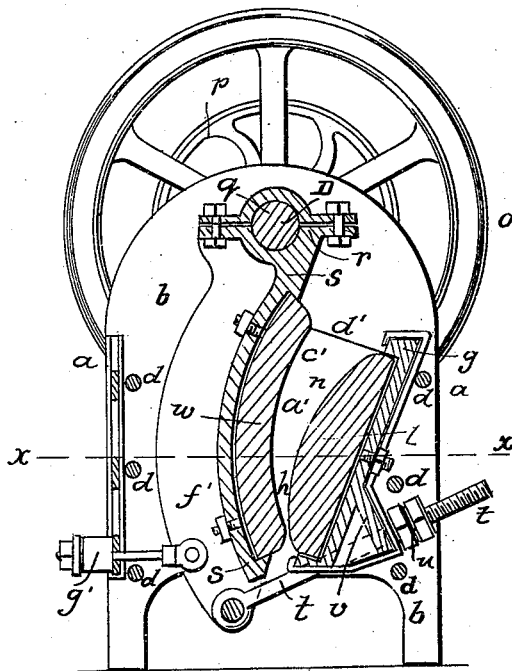


Fig. 2.

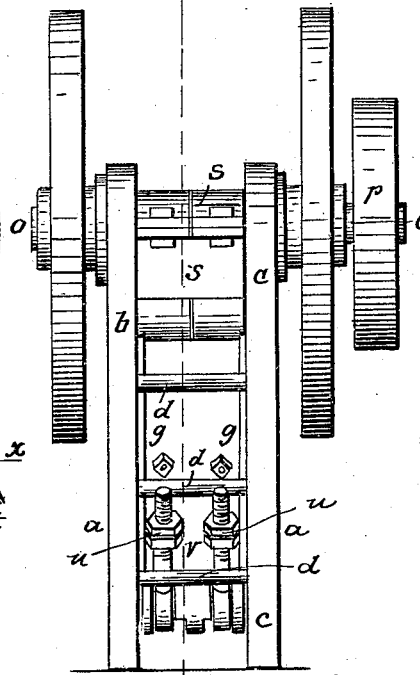


Fig. 4.

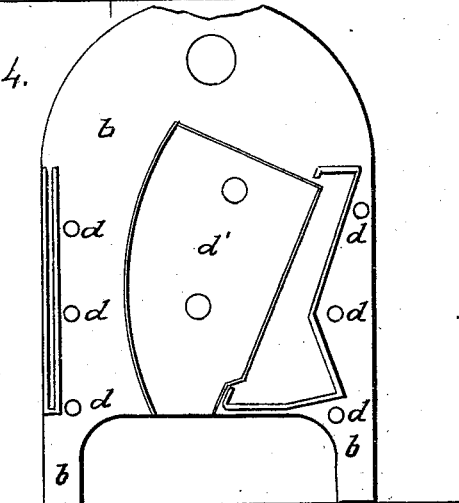
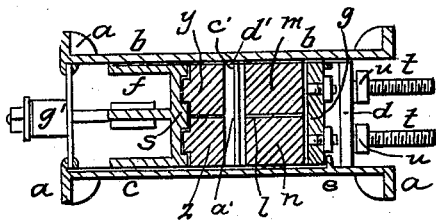


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

ZENAS WHEELER, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN ORE-CRUSHERS.

Specification forming part of Letters Patent No. 53,066, dated March 6, 1866; antedated February 19, 1866.

To all whom it may concern:

Be it known that I, ZENAS WHEELER, of the city and county of San Francisco, State of California, have invented new and useful Improvements in Ore-Crushers; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a central longitudinal vertical section of my invention; Fig. 2, an end view of the same; Fig. 3, a horizontal section of the same in plane of line *x x*, Fig. 1; Fig. 4, a detail view of the same.

Similar letters of reference indicate like parts.

a a in the drawings represent the frame-work of the machine, made of any proper shape and materials, and of sufficient strength, and consisting of two parallel vertical standards or frames, *b* and *c*, secured and firmly held together by a series of cross-screw-bolts, *d d*, &c., and nuts. Between the two frames *b* and *c*, and securely fastened therein by means of screws, or in any other proper manner, and at a vertical inclination, a fixed jaw, *g*, is inserted, having the upper surface, *h*, of its die *l* convex in the direction of its length. The die *l* is made in two parts or sections, *m n*, with the division in the center, and in the direction of its length, each part or section being fastened to the jaw by means of screw-bolts, or in any other proper manner, and susceptible of removal therefrom, or insertion thereon at pleasure, for a purpose to be hereinafter specified.

o o is an eccentric shaft placed transversely across the machine, and having bearings in the upper portion of the standards, to which shaft the driving power is connected at *p* through any suitable connecting-belts, pulleys, and wheels as may be necessary. Placed upon and around the eccentric portion *q* of the said shaft, and bearing upon the same, is the upper end, *r*, of a movable jaw, *s*, which has a vertical inclination within the frame-work *a a*, but so as to be free to play therein, the lower end of which jaw is securely held, but susceptible of adjustment to any position desired, by means of screw-bolts *t t*, hinged thereto at one end, and with nuts *u u* on their outer ends,

bearing against the cross-brace arbor *v* of the frame-work, through which the bolts pass.

To the inner face of the jaws *s a* die, *w*, made in two parts or sections, *y* and *z*, is securely fastened by means of screw-bolts and nuts, the division of said die being in its center and in the direction of its length, and each part also is susceptible of removal from its jaw, as before described for the die *l*.

The exterior surface of the die *w* is of a concave shape, corresponding, or nearly so, to the convex surface of the other die, *l*, and its jaw *s* is so adjusted and arranged within the standards of the machine and with regard to the fixed jaw *g* that the space or opening *a'* between the exterior faces of their respective dies gradually diminishes in size, being largest at the upper portion thereof, as seen in Fig. 1, where the ore is placed within the machine to be crushed.

In the operation of the above-described machine the ore is first placed within the same, between its two jaws, in the space *a'*, when, by the revolution of the eccentric shaft on which the movable jaw is hung, the upper portion of the die *w* of said jaw is brought to bear with a crushing pressure upon the ore, breaking it between the same and the fixed jaw into fine particles, which, as they fall toward the lower ends of the dies, are still further broken, and falling out of the machine through the narrow space or opening *b'* between the lower ends of the dies *l* and *w*; but by hanging the upper end of the movable jaw to and upon an eccentric shaft, while its lower end is held by the screw-bolts, as described, it is evident that the movement imparted to the same by the revolution of the shaft will be at its upper portion with a crushing pressure against the ore, but gradually changing therefrom as the ore passes downward within the jaws to a rubbing or grinding motion against the same when it has reached the lower ends of the jaws, whereby the packing of the ore is prevented, as now often occurs if the fine particles thereof are subjected to a crushing pressure, the advantages of which are many.

By forming the jaw-dies in two parts, as described, as they become worn by use, which is the greatest in the central portion thereof, they can be removed from the jaws and transposed in position, bringing their outer edges

to the center, the advantages of which are that a more even wear can thus be given to them, and also the ore can be reduced to a more even fineness, for if not so formed and arranged the outer edges of the dies would come together, leaving a large opening in the center, which would permit the ore to pass out of the machine in quite coarse particles, as is evident without further description.

The lower end of the movable jaw can be set at any desired position with regard to the fixed jaw by simply turning the nuts *u* either to the right or left upon their bolts, and thus the opening between the two increased or decreased in size at pleasure, whereby the fineness of the ore delivered from the jaws can be regulated as may be desired.

In order to prevent the wear of the inside faces of the frames in which the jaws of the machine are held, I line or cover the portion *e'* thereof embraced between the jaws with a plate of sheet-iron, *d'*, or of any other suitable metal, said plate being securely attached there-

to by screw-bolts, and in such a manner as to be readily detached therefrom and new ones inserted as they become worn from use.

To prevent any rattle or vibration of the movable jaw when the machine is running light, I attach to its rear side, *f'*, a spring, *g'*, made of rubber or any other suitable material.

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

1. The combination, with the stationary jaw *g*, of the movable jaw *s*, when the latter is operated by the cam-shaft *o* and adjusted at its lower end by means of the screw-bolts *t t*, which are hinged thereto and adapted to produce the motion described.

2. Making the jaw-dies in two or more sections or parts, substantially as herein described, and for the purposes specified.

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Witnesses:

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