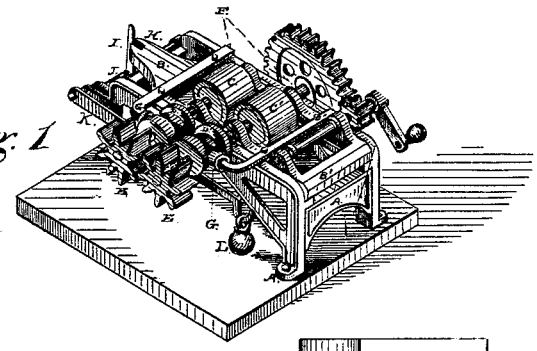
T. McGLEW.

Machine for Crushing and Grinding Ores, &c.

No. 204,676. Patented June 11, 1878.

Fig. 1



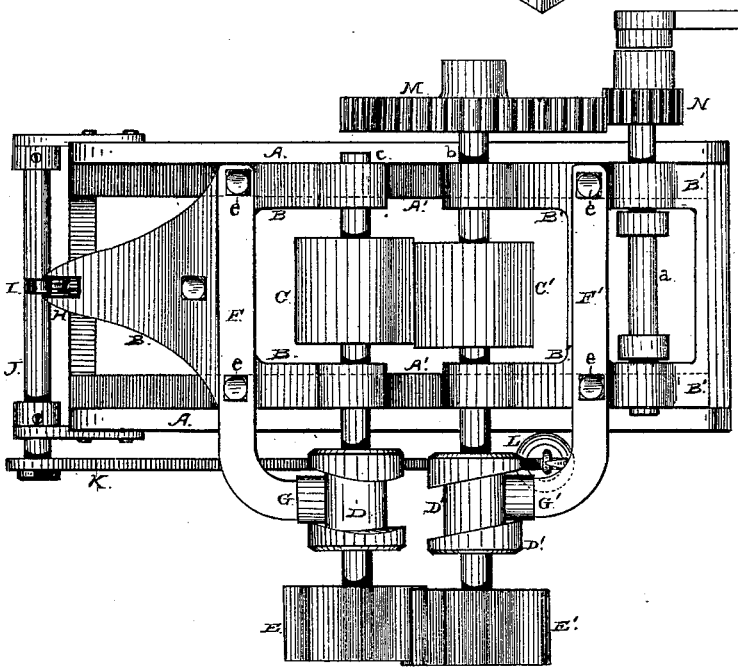
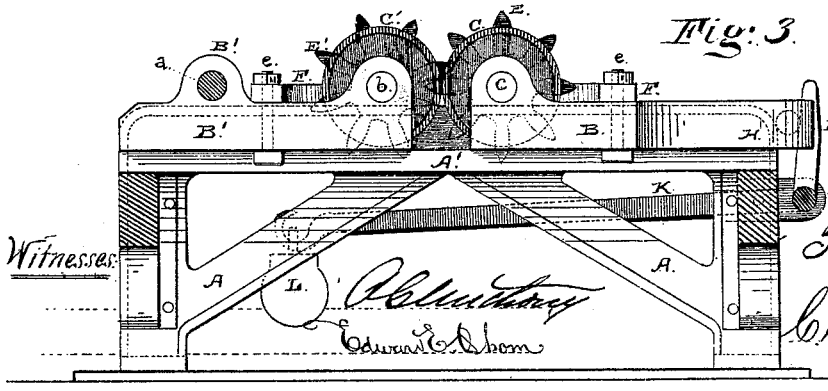


Fig. 2.

Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

THOMAS McGLEW, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN MACHINES FOR CRUSHING AND GRINDING ORES, &c.

Specification forming part of Letters Patent No. **204,676**, dated June 11, 1878; application filed February 18, 1878.

To all whom it may concern:

Be it known that I, THOMAS MCGLEW, of the city and county of San Francisco, in the State of California, have invented a certain new and useful Improvement in Machines for Crushing and Grinding Ores, which invention is fully set forth in the following specification and accompanying drawing.

In the drawing herein referred to, Figure 1 is a perspective view of my invention as constructed in accordance with this specification. Fig. 2 is a top view of the machine; and Fig. 3 is a side elevation of Fig. 2, partly in section.

My invention relates to that class of crushing and grinding machines in which cylinders or rollers are employed, and it is designed more especially for crushing and pulverizing quartz.

It consists in the peculiar means for giving to the rollers a transverse movement or reciprocation in their bearings in addition to and in combination with their ordinary rotary motion, so that while they revolve they have also a rubbing movement past and against each other.

It also consists in mounting one of these rollers in a sliding frame, whereby it is capable of moving toward or away from the other roller.

In the said drawing, the frame of the machine, A A, is provided with a track or way, A′ A′, extending the length of the machine along the inner side of the side frames, upon which are laid the roller-frames B B′. One of these frames, B, has bearings for the shaft *c* of the roller C, and is capable of moving upon its track toward and away from the fixed roller C′; and the other frame, B′, is secured to the frame A by means of the bolts *e e*, and is provided with bearings, both for the roller-shaft *b* and for the driving-shaft *a*.

The movable frame B is so held that its roller C shall be kept in contact with the roller C′ by the action of the rock-shaft J, its arm I, and the lever K, and counter-weight L. The end of the arm I fits in a slot in the end of the extension H of the frame B, and the weight of the counterpoise L acts to keep the roller C in working position against the other roller, from which it is only moved by the action of any large particles too hard to be crushed by the rollers, or of too great size to be acted upon by them. This construction allows such pieces to separate the rollers and pass between them, instead of lodging in the space between the rollers and acting to wear their surfaces into grooves. This tendency of the roller C to move back can be varied and regulated by changing the size of the weight L.

The rollers C C′ are rotated by means of the gear M on the shaft *b*, driven by the pinion N and the broad-faced gears E E′ on the outer ends of the shafts *b c*, whereby the rotation of the rollers is produced continuously with their reciprocating movements, and also without being interrupted by the sliding movement of the frame B.

The movement of the rollers C C′ past each other and in the direction of their axes is produced by means of the grooved cams D D′, fixed to the roller-shafts *b c*, and the rigid arms F F′, secured to the frames B B′, and having the rollers G G′ upon their ends, which work in the grooves of the cams. Thus the revolution of the cams causes the fixed arms to move the shafts *b* and *c* in and out of their bearings with a reciprocating movement, and the form of the grooves and the adjustment of the cams cause this motion of each roller C C′ to take place in opposite directions, so that they move past each other with a rubbing motion.

By the combination of these two motions the surfaces of the rollers are constantly changing with reference to each other, and are thereby caused to wear evenly and smoothly, and thus to greatly increase the working of the machine.

By changing the form of the cam-grooves the movements of the rollers can be varied, and they thereby caused to travel and move past each other at a slower or faster rate.

The cylinders C C′ I construct with a separate sleeve or jacket of harder metal, secured upon the outside of the cylinder, but capable of being removed when worn and replaced by new ones.

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

1. The crushing and grinding rollers C C′

and their sliding shafts *b c*, one of which is connected with the power, in combination with the broad gears E E′ and cams D D′ on the shafts, and the arms F F′ secured to the frame, and having rollers engaging with the grooves in said cams, substantially as described and shown.

2. In a crushing and grinding machine, the combination of the rollers C C′ and mechanism for giving them rotary and reciprocating motions with the sliding frame B, carrying one of the rollers and its shaft, and moved toward the center of the machine by a weight, so that the rollers will separate to allow large pieces to pass between them, substantially as described and shown.

3. The combination, with the crushing and grinding rollers C C′, having rotary and reciprocating motions, of the sliding frame B, carrying one of the rollers, the arms I K, rock-shaft J, and weight L, all constructed and arranged substantially as described and shown.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 17th day of January, 1878.

THOMAS McGLEW. [L. S.]

Witnesses:
C. W. M. SMITH,
E. V. SUTTER.