(No Model.)

D. B. JAMES.

QUARTZ MILL.

No. 458,170. Patented Aug. 25, 1891.

Fig. 1.

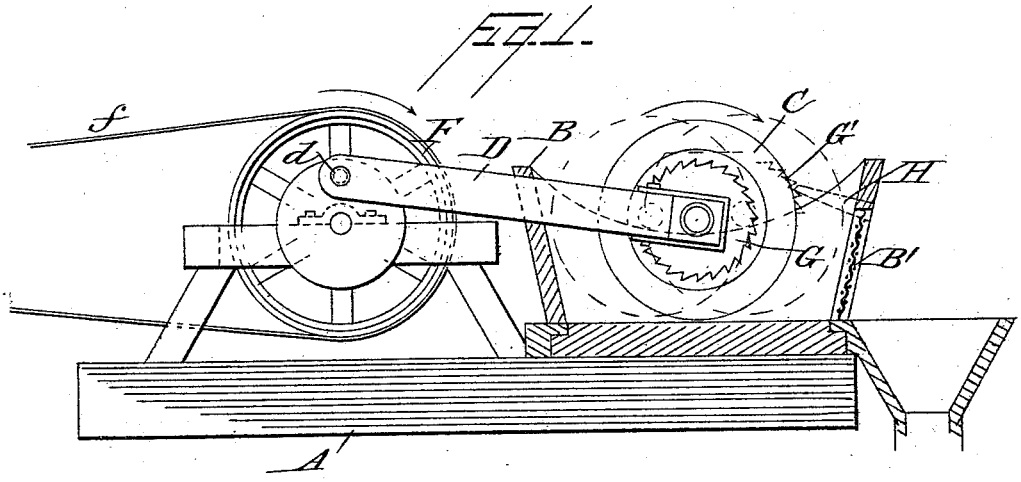


Fig. 2.

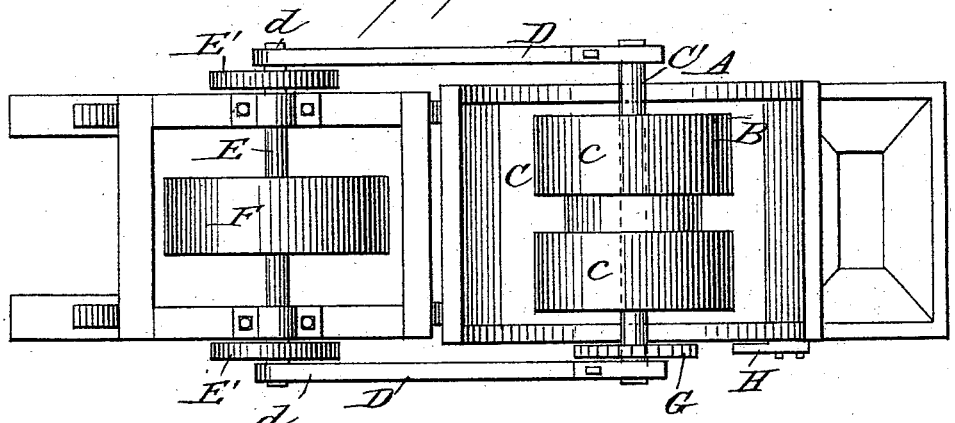
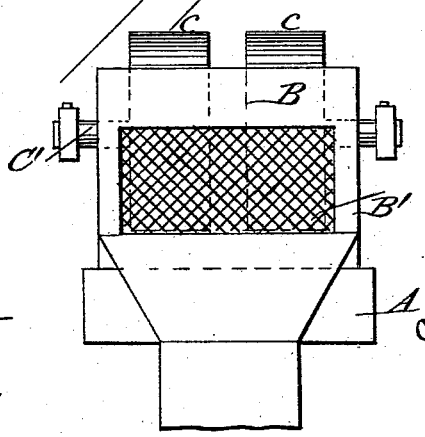


Fig. 3.



Attest:

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UNITED STATES PATENT OFFICE.

DAVID BICE JAMES, OF SAN FRANCISCO, CALIFORNIA.

QUARTZ-MILL.

SPECIFICATION forming part of Letters Patent No. 458,170, dated August 25, 1891.

Application filed February 5, 1891. Serial No. 380,355. (No model.)

To all whom it may concern:

Be it known that I, DAVID BICE JAMES, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Quartz-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in quartz-mills, the object of the invention being to provide a simple, cheap, and efficient rolling or reciprocating construction for use in connection with a mill of this sort; and the invention therefore consists in the construction, arrangement, and combination of the several parts, substantially as will be hereinafter described and claimed.

In the accompanying drawings illustrating my invention, Figure 1 is a side elevation of my improved quartz-mill. Fig. 2 is a top plan view of the same. Fig. 3 is a right-hand end elevation.

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

A designates the frame of my improved quartz or other mill, which obviously may be of any suitable and desired construction, provided it is adapted for the convenient arrangement therewith of the several mechanical parts which constitute my improvements.

B denotes a mortar or box, the bottom of which is preferably provided with steel dies whereon the roller operates in crushing. This box or mortar has any suitable or desirable form, shape, and size. One side is provided with the screen B′, (see Fig. 3,) of any suitable and desirable form, it being a sort of perforated or finely-meshed strainer, and against it the ground pulp is thrown by the action of the roller.

Located within the mortar B is a roller C. This roller C is preferably provided with a pair of crushing-rings *c c*, having a suitable thickness—say three inches or so—so that when they are worn out they can be renewed by the substitution of new ones. The roller C is adapted to roll back and forth in the mortar. This iron-shod roller is of suitable weight, say fifteen hundred pounds. Through it passes a shaft C′, to each end of which is connected a rod D, said rods D D being pivotally connected by pins *d* to the disks E′ on the crank-shaft E. This shaft E carries a pulley F, which is driven by the belt *f*, said belt being actuated by any desirable driving power. It will be observed that as the pulley F is rotated by the action of the belt, and the shaft E is in consequence revolved, the motion will be transmitted by the connecting-rods D D to the roller C, and it will be caused to roll back and forth within the mortar B on a short stroke with a positive movement. The roller will revolve during its back-and-forth movement within the mortar, so that the wear will be uniform upon the roller. This action of the roller will operate to crush successfully the material within the mortar and will project the pulp against the screen B′, so that the superfluous matter may pass down through the hopper, which has its mouth located adjacent to the screen B′.

In order that the roller C may be constantly rotated as well as moving backward and forward, so that the wear may be the same upon every portion of the cylindrical surface of the roller, I find it convenient to place a ratchet, as G in Fig. 2, or G or G′ in Fig. 1, said ratchet being located upon the shaft C′ or upon the connecting-rod, and this ratchet is adapted to be engaged by a tooth or pawl bar H, which projects from one side of the mortar, and may be provided with set-screws or hinged or arranged in such a manner as that when the roller moves toward the screen B′ the teeth of the ratchet will encounter the projecting pawl H, and thus the roller will be rotated a certain amount—say half an inch or so—at each of its strokes.

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

1. The combination of the frame A, the mortar B, the roller C, having rings *c c* and shaft C′, the connecting-rods D D, the crank-shaft E, and one or more ratchets with a pawl-bar

arranged so that the roller may be intermittently rotated during its back-and-forth lateral motions.

2. The combination of the frame A, the mortar B, the roller C, having rings *c c* and operating upon steel plates in the bottom of the mortar, said roller having also a shaft C′, the connecting-rods D D, connected to said shaft, the crank-shaft E, having pulley F, and the ratchet G and pawl-bar H, together with the screen B′, all arranged substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DAVID BICE JAMES.

Witnesses:
J. W. LEMMON,
C. T. SWAIN.