No. 610,599. Patented Sept. 13, 1898.

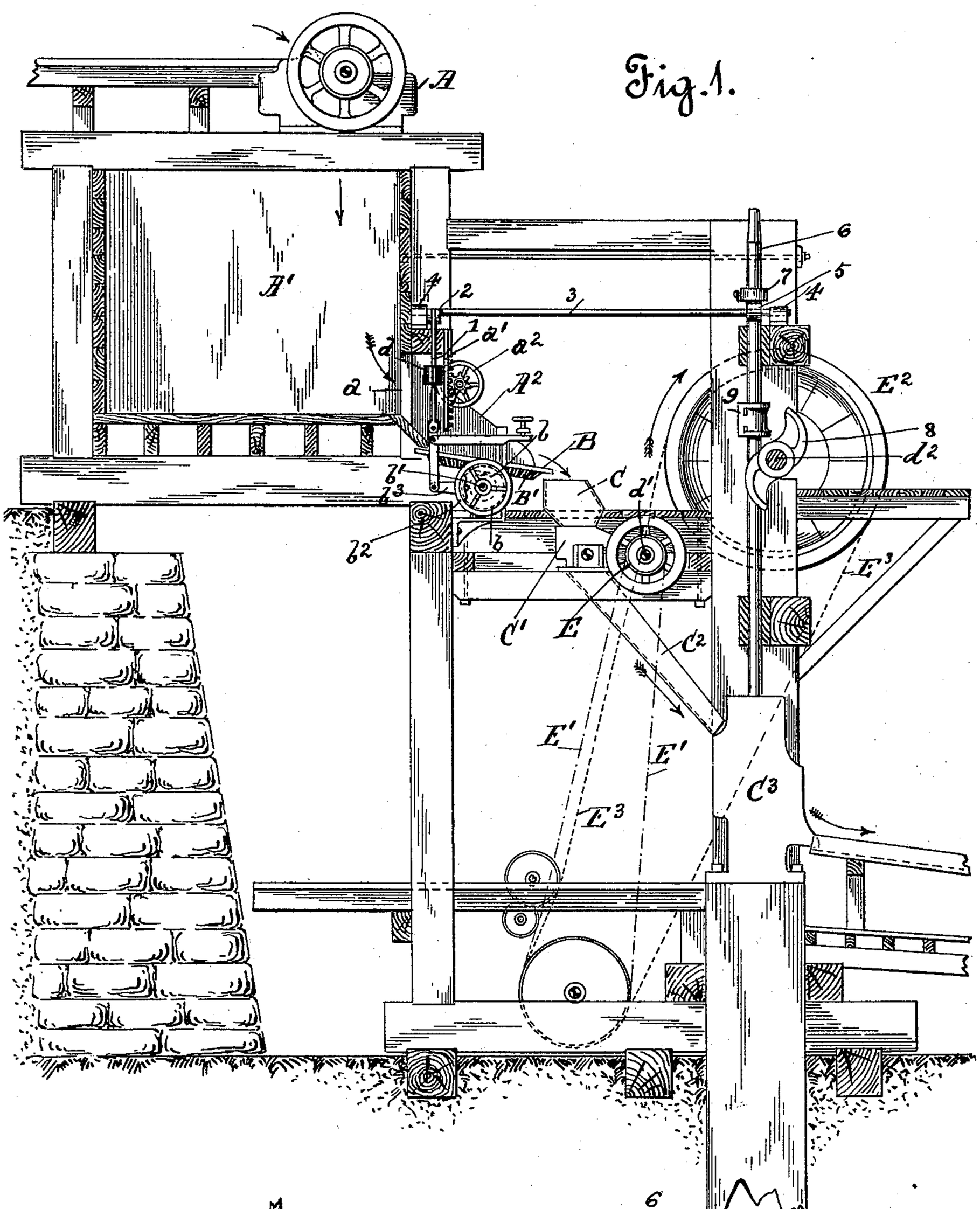
J. CHAMPION.

ORE STAMP BATTERY.

(Application filed Dec. 6, 1897.)

(No Model.)

Fig. 1.



Witnesses.

F. A. Lonteverde.

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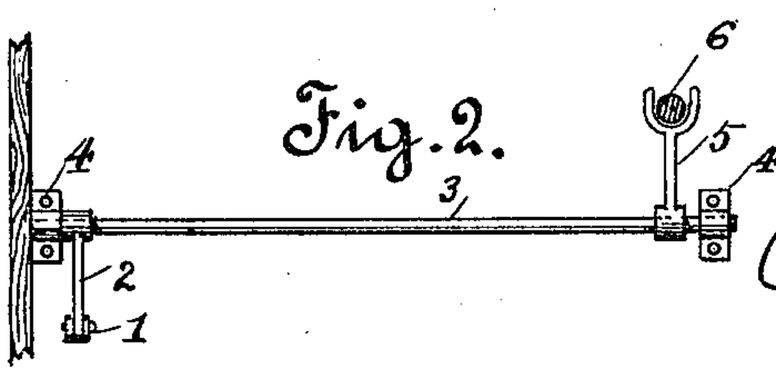
Fig. 2.



Inventor.

Josiah Champion

by Paddock.

his atty.

UNITED STATES PATENT OFFICE.

JOSIAH CHAMPION, OF ENTERPRISE, CALIFORNIA.

ORE-STAMP BATTERY.

SPECIFICATION forming part of Letters Patent No. 610,599, dated September 13, 1898.

Application filed December 6, 1897. Serial No. 660,907. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH CHAMPION, a citizen of the United States, residing at Enterprise, in the county of Butte and State of California, have invented certain new and useful Improvements in Ore-Stamp Batteries; and I do hereby declare that the following is a full, clear, and exact description thereof.

The present invention relates to a certain new and useful improvement in ore-stamp batteries which has for its object to relieve the stamps of considerable work required thereof in the mortar, so as to permit of the stamps doing better and more effective work; and it consists in the arrangement of parts and details of construction, as will be hereinafter fully set forth in the drawings and described and pointed out in the specification.

In the ordinary ore-stamp battery the ore is first crushed into pieces about an inch to an inch and a half in size and thus crushed is fed to the mortar of the battery, wherein it is pulverized or reduced to a pulp by the action of the stamps, so as to escape from the mortar through certain-mesh screens. This second pulverizing or reducing of the ore requires considerable work on the part of the stamps and necessarily delays the output of ore from the mortar, for the same cannot escape therefrom until after reduction to a fine pulp. By the present invention I propose to interpose between the ore bin or box a second crusher which shall receive the ore as fed from the ore bin or box of the first crusher and thoroughly crush the same before feeding the ore to the mortar of the battery. In this manner the ore is delivered to the mortar in a finely-crushed condition, and very little work is required on the part of the stamps to reduce the same to such a pulp as will enable it to escape through the screen of the mortar toward the concentrator. By this second crushing of the ore prior to its introduction to the mortar I am enabled to make use of much lighter stamps and work a greater amount of ore per day than where the pulverization of the ore is completely accomplished by means of the stamps themselves.

In order to understand the invention, reference must be had to the accompanying sheet of drawings, forming a part of this application, wherein—

Figure 1 is a side view in elevation, disclosing the main ore-crusher and its bin or box, the battery, the secondary or fine crusher interposed between the mortar and the ore bin or box, and the mechanism for operating the ore-feed mechanism; and Fig. 2 is a detail top plan view of the rock-shaft which operates the ore-feed.

In the drawings the letter A is used to indicate the outer casing for any suitable rock-crusher, from which crushed ore falls into the ore bin or box A′, located therebelow. This ore bin or box is provided with an outlet-chute A^2, the outlet-opening *a* of the bin or box being controlled by the gate *a′*, which is raised or lowered in the usual manner by the hand-wheel a^2. The bottom of the ore-feed chute consists of the rotatable plate B, to the under face of which is secured the bevel-gear B′, which meshes with the pinion *b*, mounted upon the cross-shaft *b′*. To the outer end of said shaft is secured the wheel b^2, to which is eccentrically connected the short arm b^3. This rotatable ore-feed constitutes what is known as the "Challenge" ore-feed. To the outer end of arm b^3 is attached the lower end of connecting-rod 1, the upper end of which is secured to an arm 2, outwardly extending from the rock-shaft 3, which shaft works in bearing 4, secured to the frame of the mill. From the opposite end of the rock-shaft 3 rearwardly projects the arm 5, the free end of which is bifurcated, so as to straddle one of the battery-stamps 6. To this stamp is fastened, above the arm 5, the collar 7, which when the stamp falls or drops a certain distance bears upon the end of the arm 5 and forces the same downward. As this arm is thrown downward the rock-shaft is turned so as to throw the arm 2 upward, which, carrying therewith the rod 1, raises the arm b^3, causing the rotatable table or plate B, through the medium of the gear B′ and pinion *b*, to turn in order to shake the ore from the feed-chute A^2 into the hopper C of the secondary crusher C′. The moment the stamp lifts or rises the weight *d*, secured upon the connecting-rod 1, returns the parts to their normal position.

The ore fed into the hopper C is finely crushed in the crusher C′, which is similar to the Blake crusher A, (only designed to crush

the ore much finer,) and after being thus crushed falls into the chute C^2 and is delivered into the mortar C^3. The ore thus delivered into the mortar is reduced to a pulp by the action of the stamps working therein. Inasmuch as the ore fed into the mortar is finely crushed—say about the size of a pea—very little work is required to reduce the ore to a pulp. Hence the heads of the stamps may be considerably reduced in weight and a greater output be secured from a given battery than when the ore is fed directly into the mortar from a single crusher and has to be finely crushed and reduced to a pulp by the action of the stamps direct.

As the fall or drop of the stamp 6 depends upon the amount of pulp within the mortar, it will readily be seen that the feed of the ore from the bin A′ to the crusher C′ is automatically controlled by the works of said stamp. The stamp is raised by the cam 8 acting upon the tappet-collar 9, as is usual in this class of machinery.

Any suitable drive mechanism may be employed for the various parts; but in the present case I have illustrated the belt-wheel E, mounted on the end of shaft d' of the crusher C′, as driven by the belt E′, while motion is transmitted to the wheel E^2 of the cam-shaft d^2 by belt E^3.

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

1. In an ore-stamp battery, the combination of a primary ore-crusher, a bin into which the ore falls from the crusher, a secondary crusher for crushing the partially-crushed ore from the bin, a feeder for delivering ore from the bin to the secondary crusher, a stamp, a chute for delivering the ore from the secondary crusher to the stamp, drive mechanism for the crushers and stamp, and connected mechanism between the stamp and the feeder whereby the feed of the ore from the bin to the secondary crusher is automatically regulated by the stamp.

2. In an ore-stamp battery, the combination of a primary ore-crusher, a bin which receives the ore from said crusher, a feeder leading from said bin, a stamp, a secondary ore-crusher interposed between said feeder and stamp and from which the ore passes to the stamp, and means regulated by the stamp for operating said feeder to feed the ore from the bin to the secondary crusher.

3. In an ore-stamp battery, the combination with the primary or coarse crusher for the ore, of the ore-bin which receives the ore from said crusher, the ore-feed leading from said bin, the secondary or fine-ore crusher interposed between the ore-feed and the mortar of the battery, the chute for conveying the fine-crushed ore to the mortar, the rotatable table or plate in the bottom of the ore-feed, a gear secured to the bottom thereof, a pinion meshing therewith, said pinion mounted upon a shaft, the arm eccentrically connected to the outer end of said shaft, the rock-shaft, the connecting-rod forming connection between the said arm and an arm projecting from the rock-shaff, the bifurcated arm secured to and projecting from the opposite end of the rock-shaft, the stamp which the said arm is operated by and the collar mounted upon said stamp so as to engage with said arm, and rock said rock-shaft in one direction, and means for returning the rock-shaft to its initial position.

4. In an ore-stamp battery, the combination of a supply, a feeder, a stamp, means operated by the stamp for operating said feeder, and a crusher interposed between said feeder and stamp whereby the ore is delivered to the stamp in proper condition for operation.

In testimony whereof I affix my signature, in presence of two witneses, this 20th day of October, 1897.

JOSIAH CHAMPION.

Witnesses:
A. F. JONES,
L. V. HENDRICKS.