No. 616,915. Patented Jan. 3, 1899.

J. GERSTLE.

ORE GRINDER AND AMALGAMATOR.

(Application filed Oct. 26, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

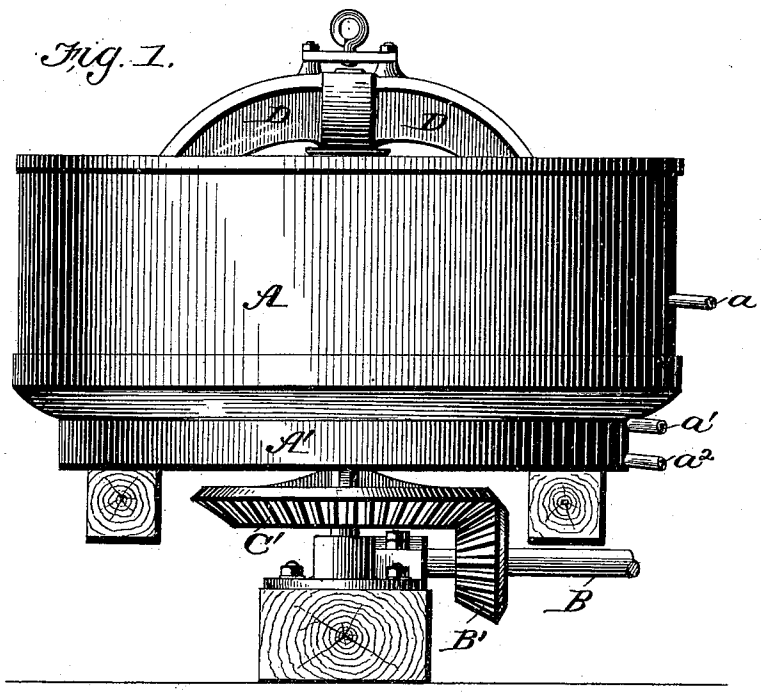
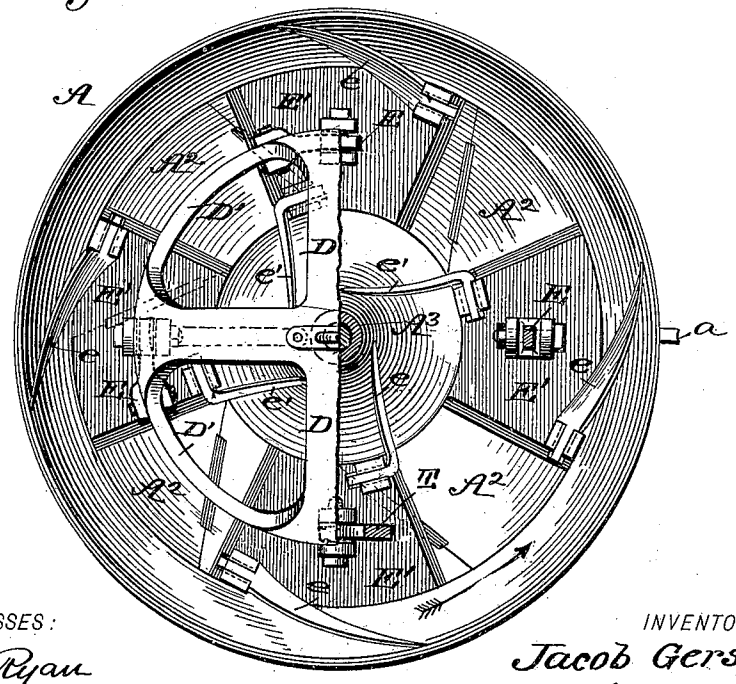


Fig. 3.



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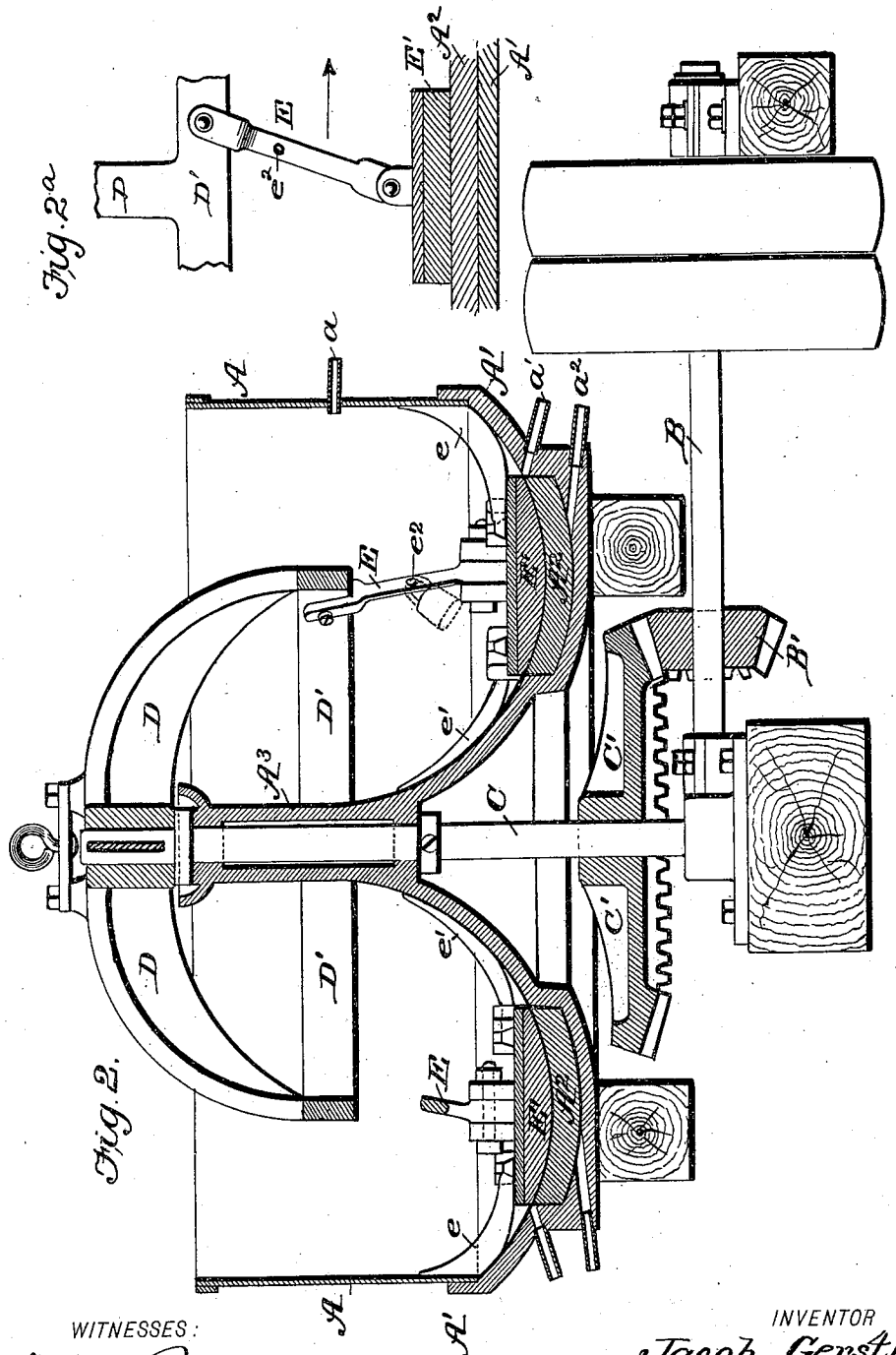
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UNITED STATES PATENT OFFICE.

JACOB GERSTLE, OF PORTLAND, OREGON.

ORE GRINDER AND AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 616,915, dated January 3, 1899.

Application filed October 26, 1897. Serial No. 656,430. (No model.)

To all whom it may concern:

Be it known that I, JACOB GERSTLE, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have invented a new and useful Improvement in Ore Grinders and Amalgamators, of which the following is a specification.

The object of my invention is to provide a grinding or pulverizing device for use in grinding or pulverizing ore and amalgamating the precious metals with quicksilver; and it consists in the construction and arrangement of grinding-pan and pulverizing devices herein shown and described whereby the work is accomplished very perfectly and with great rapidity.

Figure 1 is a side elevation; Fig. 2, a central vertical section. Fig. 2^a is a sectional detail showing the trailing grinding-shoe, and Fig. 3 a plan view with one-half of the rotating frame cut away.

A is a cylindrical pan having a cast-metal bottom A′ with depressions in it in which are seated a series of dies or rubbing-surfaces A^2, extending around in a circle at the lowest part of the bottom of the pan. The tops of these dies are flush with the bottom of the pan, which is curved in cross-section from the center outwardly.

The pan is held stationary upon base-timbers, as shown, and through the central hub A^3 there extends the vertical shaft C, which at the upper end is rigidly keyed to a pendent circular frame D D′ and at the lower end revolves in a step-bearing and has rigidly keyed to it a bevel gear-wheel C′, which is driven by a smaller bevel-gear B′ on a drive-shaft B, having a tight and loose pulley, as shown in Fig. 2.

E′ are the grinding-shoes, connected by hinged arms E to the revolving frame D′, and $a\,a\,a^2$ are outlets for the ground ore and quicksilver.

The pan-bottom is curved in section, so that the pulp gravitates to the middle line between the grinding-surfaces. In order that every particle of the pulp may be kept moving, so as to come under the shoes and come in contact with the quicksilver, there are scrapers *e* and *e′* for each shoe, which scrapers are shaped like plowshares. One of these, *e′*, extends up along the conical hub of the pan and will continually loosen and bring down the pulp which generally collects near the center of the pan and around the middle hub, and the other one, *e*, draws the pulp back from the outer edge of the pan. It will thus be seen that the pulp is kept in constant motion and cannot become compact by the heavier part settling on the bottom. The main advantage, however, from this arrangement is that in this way the larger and heavier particles of the pulp are kept in constant motion and brought under the action of the grinding-shoes and are ground up, and thus the gold is freed and precipitated to the bottom and caught by the quicksilver.

With respect to the arms E that hold the shoes I would state that these arms if made stiff do not yield and as the pulp gets lower or the shoes get worn the pressure is reduced. There is in such case only one of two things to be done—either the shoes have to be renewed every little while or more pulp put in in order to keep up an even pressure. Hence the arm E is joined by hinges (see Fig. 2^a) and is set at a slight angle to the vertical, so as to drag. There is also an eye e^2, from which weights are to be hung, as shown in dotted lines in Fig. 2, which overcomes this defect, for as the shoes get thinner or the pulp less a larger weight is added, and in this way an even pressure is kept up. Instead of the shoes having to be renewed every little while they can be used until worn quite thin, for the pressure is maintained just the same.

The dies A^2 form a detachable bottom to the pan and are seated in a recess in the bottom of the pan with their upper faces flush with the curved bottom. They are so joined that a section may be removed at one time. This is done when cleaning out the quicksilver. By such arrangement this is rapidly done and greatly facilitates making repairs.

The wear and tear, owing to the curved bottom and general construction of the dies, hanging of the shoes, &c., is reduced to the minimum. In most mills and pans the wear runs from twenty-five to fifty cents per ton. My pan will not average over one cent per ton, which involves a very great saving.

The pulp to be used must be crushed to a forty-mesh fineness, and the pan will hold from one to one and a half tons and run it out in from one and a half to two and a half

hours, according to the ore. The contents of the pan can be easily discharged by means of the waste-pipes a a' a^2 on the side of the pan. The highest one is to run off the top, and as the pressure is reduced and contents lessened the next one is opened. The lowest one is to let off the quicksilver after the dies have been removed. The machine is kept revolving while being discharged, and in this way every particle is cleared out. Water may be turned in to flush out, if necessary.

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

An ore grinder and amalgamator consisting of a pan having a concave bottom A′ rising in the center in the form of a conical hub, and having an annular recess at its lowest point containing detachable flush-laid dies A^2, a superposed rotating frame D D′, inclined and pivoted trailing arms E having shoes E′ at their lower ends, said shoes being provided each with an outer scraper e and an inner scraper e', and outlets a a' a^2 for the water and material substantially as shown and described.

JACOB GERSTLE.

Witnesses:
C. A. VARNEY,
W. H. MERCER.