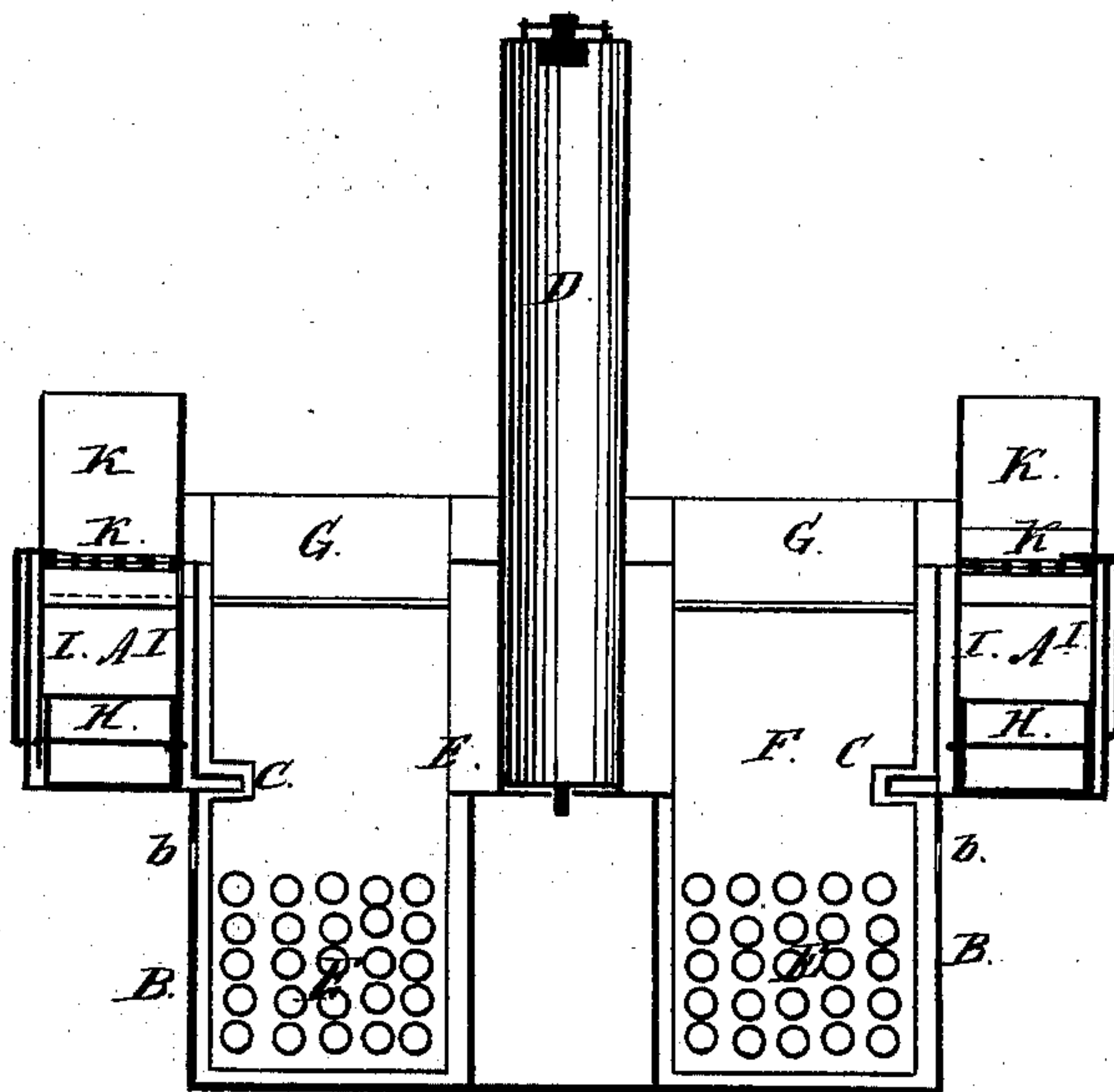
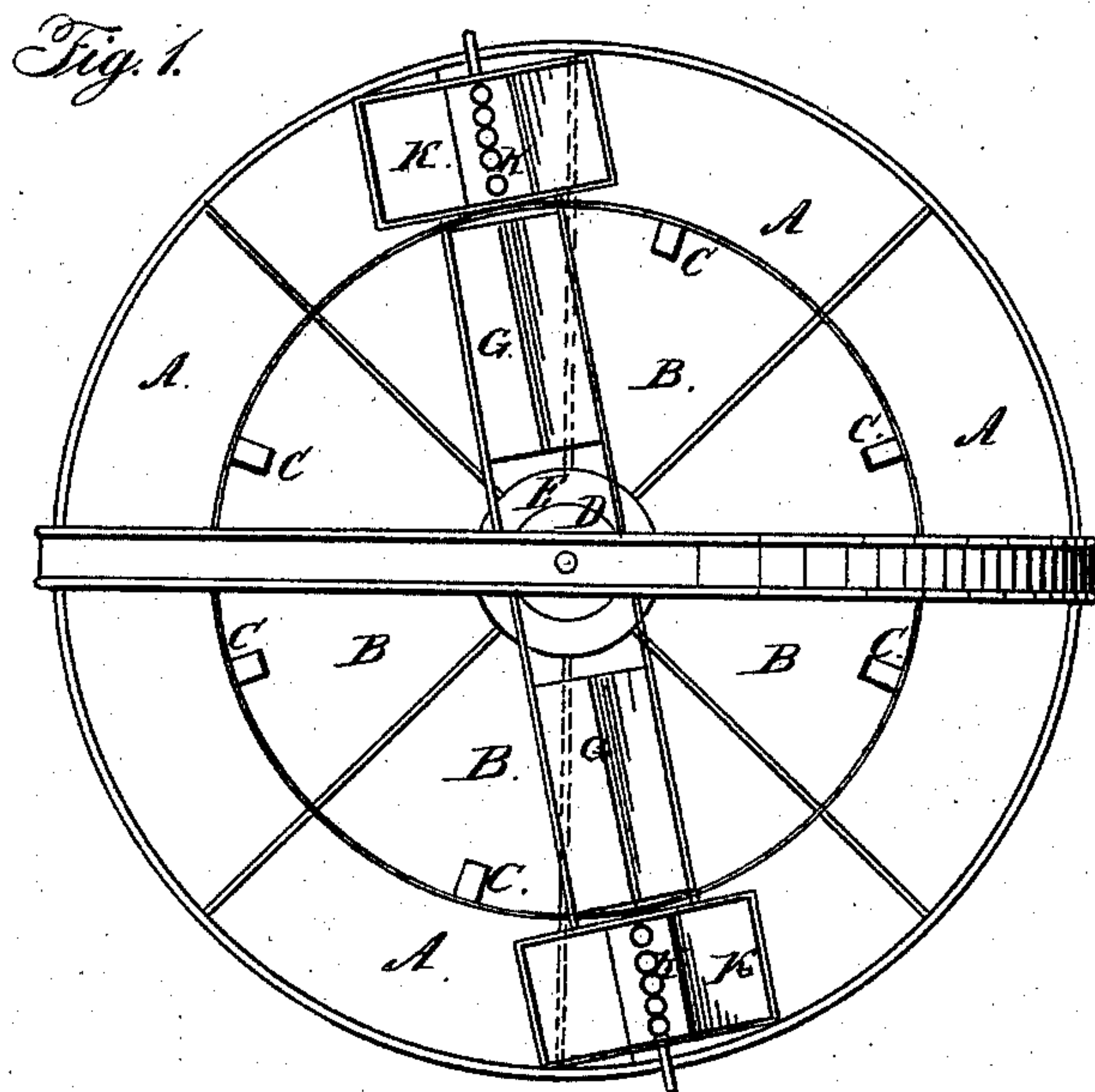


G. B. FIELD.
Ore Amalgamator.

No. 68,175.

Patented Aug. 27, 1867.



Witnesses:

Chas. A. Pettit
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Inventor:

Geo. B. Field
per Mann & Co.
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United States Patent Office.

GEORGE B. FIELD, OF NEW YORK, N. Y.

Letters Patent No. 68,175, dated August 27, 1867.

IMPROVED AMALGAMATOR.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE B. FIELD, of the city, county, and State of New York, have invented a new and improved Amalgamator; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, and in which—

Figure 1 represents a top view of my invention.

Figure 2 is a cross-section of the same through the centre of the arms G G.

Similar letters of reference indicate corresponding parts in the two figures.

In this invention the pulverizing-roller has a backward and forward motion through the segment of a circle in an amalgam-chamber of the proper form. The amalgam-chambers, settling-chambers, rollers, and agitators are so constructed and arranged that they will occupy a less space than in any amalgamator now in use of equal capacity. All the parts except the rollers and bottom of the amalgam-chambers may be made of wood, at a trifling expense, and the rollers and bottoms of the chambers may be made of wood, stone, or metal.

In order that others skilled in the art to which my invention appertains may be enabled to make and use the same, I will proceed to describe it in detail.

In the drawings, A A are the amalgam-chambers, constituting, together, an annular box, with vertical walls and a horizontal bottom. Each chamber is an arc or segment of the annular box, which may consist of two or any greater number of such chambers. Inside of the circle enclosed by the ring of amalgam-chambers is a similar ring of settling-chambers, B B B, corresponding in number and position to the amalgam-chambers, but situated below them, so that the tops of the inner or settling-chambers are about on a level with the bottoms of the amalgam-chambers. Conduits C C, at the bottom of the inner wall of the chambers A A, lead into the chambers B B.

In the centre of the apparatus above described, in a cylindrical box or screen, E, stands a vertical shaft, D, furnished with stout horizontal arms G G, one extending across each settling-chamber to the outer wall of the adjoining amalgam-chamber, and bearing agitators F F, which project downward into the chambers B B, rollers H H, bearing in frames I I, and hoppers K K. The latter rest upon the arms G G, and hold the ore in its raw, unreduced condition. Agitating-bottoms *k k* are employed in them, similar in construction to the agitating-bottoms of the seed-boxes of machines for sowing grain, and having the necessary vibrating motion imparted by means of cams or in any other suitable manner. Through these perforated bottoms the ore is fed slowly to the amalgam-chamber below, where it is thoroughly crushed and ground to powder by the forward and backward motion of the rollers H H. These rollers may be made of stone or metal, as may be most convenient. They rest upon the ore and roll over it, crushing it by their weight, and at the same time, as they swing around the arc of the circle from one end of the chamber to the other, they grind heavily on the horizontal floor, in the same manner that car-wheels grind on the rails of a railroad in passing a curve. The effect of this combined crushing and grinding is to pulverize the ore more thoroughly than is accomplished by any other machine. The ore having been pulverized and amalgamated in the chamber A, the amalgam is taken out and the residuum is washed into the settling-chambers B B, which are filled to the outlet pipe *b* with water. There it is subjected to the vibrating action of the foraminous agitators F F, and the soluble particles are separated and washed away through the pipes *b b*, while the insoluble particles fall to the bottom and are secured by occasionally drawing off the water.

The machine may be worked by an engine by connecting the piston-rod by a pitman to either arm G. A vibrating motion back and forth through the length of the chambers A A is all that is required, and by the direct application of the power, as just described, all the expensive and cumbersome apparatus for resolving forward and backward into rotary motion can be dispensed with. This is an item of no small importance in machines designed to be used in mines remote from the settled portion of the country, as the expense and difficulty of transporting heavy shafting, fly-wheels, &c., to such localities is enormous. For the same reason my machine is superior to others in use, in that every part of it, except the rollers H H and the floors of the chambers A A, can be made of wood, while the rollers and floor can be made of stone. These materials are abundant and cheap in every locality.

One great advantage in my apparatus is its compactness. Every available part of the circular space occu-

pied by the machine is made use of. One shaft supports every part of the movable working machinery. The power can be applied at the ends of the arms G G, where it will be completely utilized. A small engine applying the power thus will accomplish more than a very large one applying it to the central shaft.

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

1. The arrangement and combination of the rollers H H with the segment amalgam-chambers A A, so that the former shall work back and forth in the latter to produce at the same time a crushing and grinding of the ores, in the manner and for the purpose substantially as above set forth.
2. The combination and arrangement of the vertical shaft D, arms G G, hoppers K K, and rollers H H, working in chambers A A, substantially as and for the purpose described.
3. The arrangement of the amalgam-chambers A A and settling-chambers B B, connected by the conduits C C, substantially as described.
4. The arrangement of the chambers A A with the chambers B B, shaft D, arms G G, agitators F F, hoppers K K, and rollers H H, substantially as specified.

Witnesses:

WM. F. McNAMARA,
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GEO. B. FIELD.