

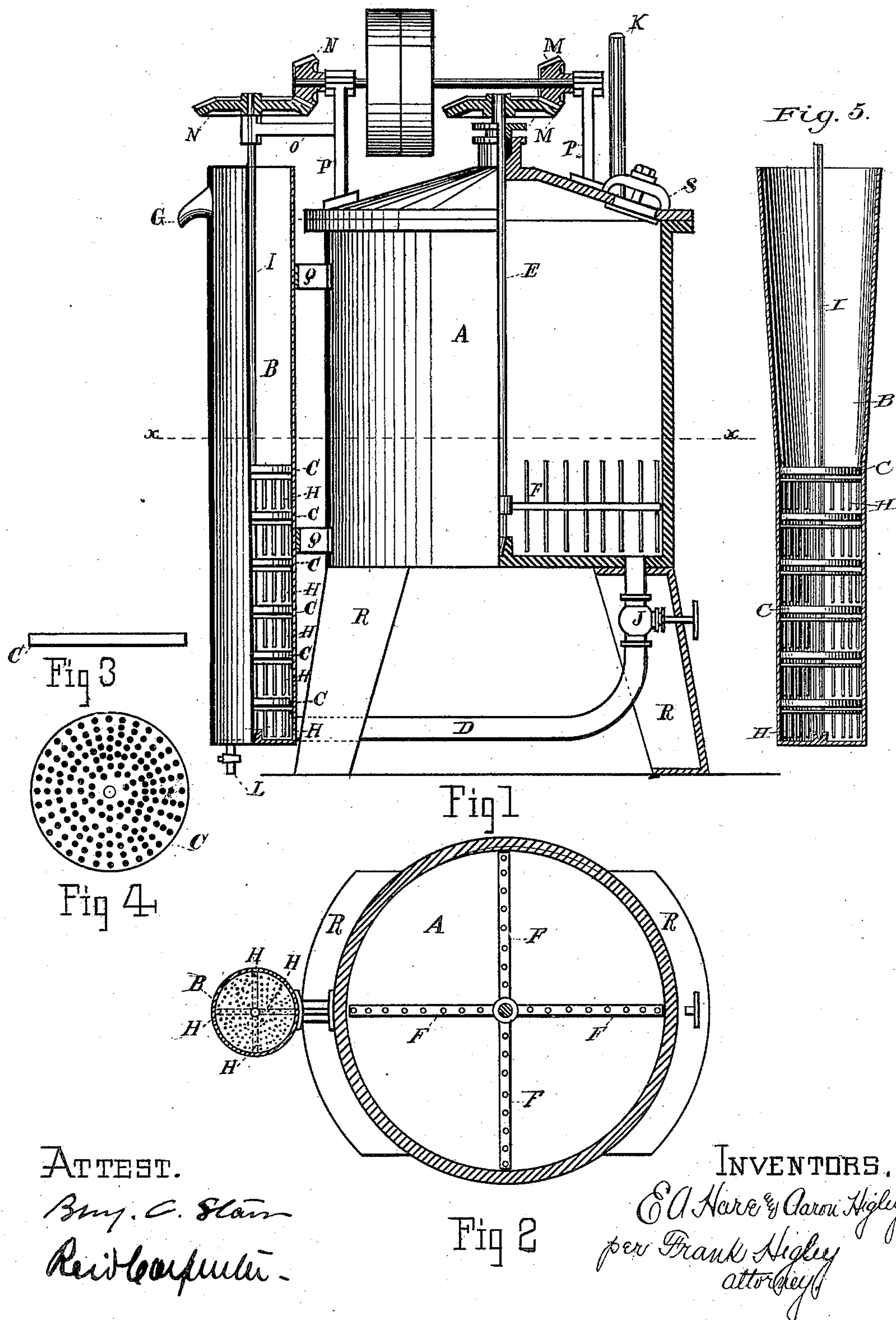
(No Model.)

E. A. HARE & A. HIGLEY.

AMALGAMATOR.

No. 309,513.

Patented Dec. 16, 1884.



ATTEST.

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UNITED STATES PATENT OFFICE.

EDWIN A. HARE AND AARON HIGLEY, OF CLEVELAND, OHIO.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 309,513, dated December 16, 1884.

Application filed July 21, 1884. (No model.)

To all whom it may concern:

Be it known that we, EDWIN A. HARE and AARON HIGLEY, citizens of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a new and useful Improvement in Amalgamators, of which the following is a specification.

Our invention relates to improvements in amalgamating-machines for separating the particles of gold or other metals from pulverized ores, in which the pulp is forced in at the bottom of an agitated body of mercury; and the object of our invention is to secure the amalgamation of the metals in pulverized ore in a cheap, rapid, and effective manner. We attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire machine. Fig. 2 is a horizontal section of the machine. Fig. 3 is a vertical section of one of the perforated plates or screens. Fig. 4 is a horizontal view of the same. Fig. 5 is a detail sectional view.

A is a closed cylindrical receptacle. On a step bearing at the bottom and in a bearing at the top of the chamber A is supported a shaft, I, provided with arms F F F F, to which a revolving motion is imparted by a bevel-gear, M M, at the upper end.

K is a pipe entering chamber A, and S is a man-hole.

B represents the amalgamating-receptacle, a cylindrical receptacle closed at the bottom, with a discharge-spout, G, at the top and a discharge-pipe, L, at the bottom. On a step-bearing at the bottom of the amalgamating-receptacle, and in a bearing above, is supported a shaft, I, to which a revolving motion is imparted by a bevel-gear, N N.

Attached to the shaft I are sets of arms H H H H, and above each set of arms is a perforated plate or screen C, which is attached to the receptacle B. The amalgamating-receptacle B is connected with chamber A by a pipe, D, having a stop-cock, J. The machine rests upon standards R R. The gears M M and N N are propelled by a shaft and pulley supported by standards P P, and the upper end of shaft I is supported by a standard, O.

Receptacle B is supported by arms Q Q. We make receptacle B from upper plate, C, upward broader than the lower part, so that there will be more opportunity for the flour mercury, should there be any, to precipitate. The arms attached to shafts I and E may be of any shape or number suitable for the purpose of agitating, and the number of perforated plates or screens and sets of arms will vary with reference to the difficulty of securing amalgamation of the ore, and our invention is not limited to any specific number of sets of arms or of perforated plates or screens. The mixing-chamber A is placed enough higher than chamber B so that the bottom of A will be about on a level with the top of the column of mercury in chamber B, this preventing a back-flow of mercury into the mixing-chamber.

The operation of the amalgamator is as follows: The pulverized ore, with water, is forced into the receptacle A through pipe K by the force of gravitation, a force-pump, or any other suitable force. The water and ore are intimately mixed by the operation of arms F F F F. The pulp thus obtained is forced through the pipe D into the amalgamating-receptacle B, which is filled with mercury to the top of upper perforated plate, C. It is here mixed intimately with the mercury by action of the agitating-arms attached to shaft I. The mercury absorbs the metals, and the pulp passes gradually up through the perforated plates or screens, and is discharged at the top at G. The pulp, being much lighter than the mercury, would spring quickly to the top before there could be complete amalgamation were it not for the perforated plates or screens. The pulp is retarded in its progress upward by being obliged to pass through the small holes in the plates or screens, so that the arms H H H H have time to mix the pulp with the mercury, while the holes in the plates or screens are small enough to prevent the pulp from passing upward in lumps, thus securing a complete mixture of the pulp with the mercury for the purpose of amalgamation. When the quicksilver has accumulated sufficient amalgam, a head of water can be forced through the machine, and all the sand will be washed out of the mercury, after which it can be drawn out through

the opening L, thus avoiding the usual trouble of washing the mercury.

We are aware that prior to our invention amalgamators have been made in which the
5 pulp was forced upward through a column of mercury, agitated by arms, in an amalgamating-chamber having perforated plates, and that chambers for mixing pulp have been used in connection with amalgamating-chambers,
10 and, therefore, do not claim this process or general construction, broadly; but

What we do claim, and desire to secure by Letters Patent, is—

1. In an amalgamating-chamber, B, widening
15 ing from upper plate, C, upward, and having a discharge-spout, G, the combination of a re-

volving shaft, I, provided with arms, with the perforated plates or screens, substantially as and for the purposes described.

2. The combination of an amalgamating-
20 chamber, B, widening from upper plate, C, upward, and having a spout, G, and revolving shaft provided with arms and perforated plates, with the connecting-pipe D and the
25 mixing-chamber A, the bottom of which is placed higher than the bottom of B, substantially as and for the purposes described.

EDWIN A. HARE.

AARON HIGLEY.

Witnesses:

REID CARPENTER,
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