(No Model.)

E. PIKE.

AMALGAMATOR.

No. 327,193. Patented Sept. 29, 1885.

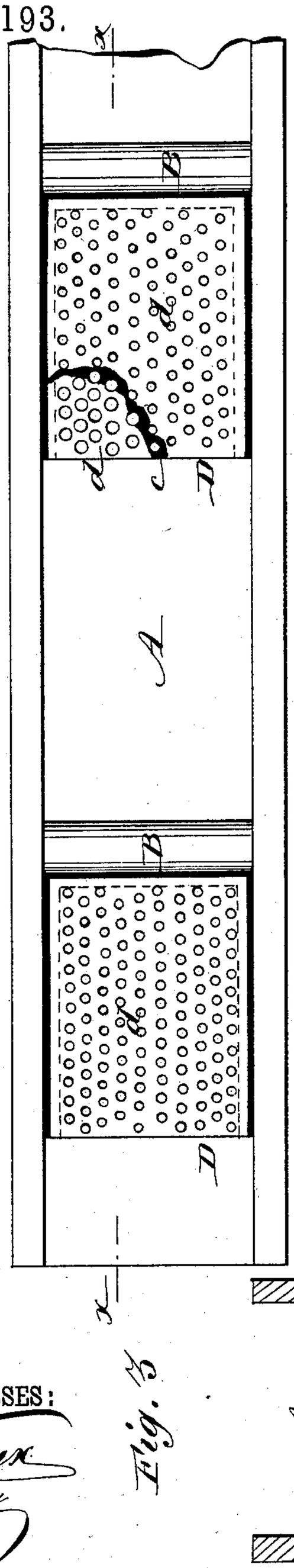

Fig. 1.

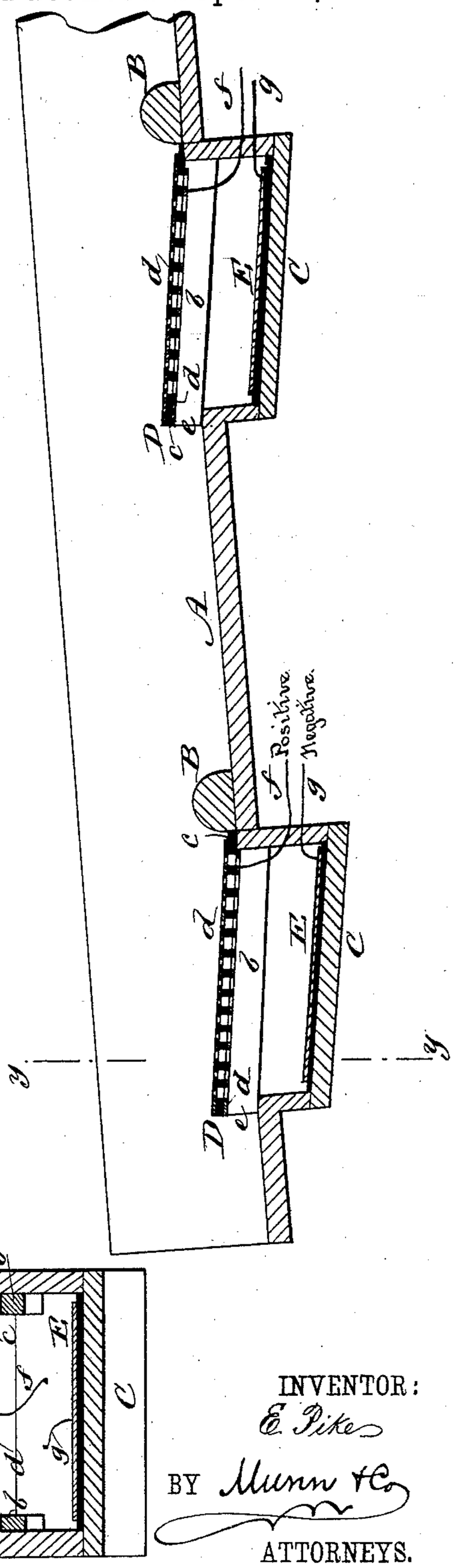

Fig. 2.

Fig. 3.

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AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 327,193, dated September 29, 1885.

Application filed May 21, 1885. (No model.)

To all whom it may concern:

Be it known that I, EDWARD PIKE, of Salt Lake City, in the county of Salt Lake and Territory of Utah, have invented certain new and useful Improvements in Sluice-Box Amalgamators and Ore-Concentrators, of which the following is a full, clear, and exact description.

This invention consists in certain attachments to an ordinary or any suitable sluice-box or flume, substantially as hereinafter described, whereby the amalgamation and saving of fine gold, floured quicksilver, and amalgam, and the concentration and separation of ores, will be more effectually accomplished.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a plan of a section of sluice-box or flume embodying my invention; Fig. 2, a longitudinal vertical section of the same on the line *x x* in Fig. 1, and Fig. 3 a transverse section thereof on the line *y y* in Fig. 2.

In any ordinary sluice-box or flume, A, at any suitable distance apart, generally about six feet, more or less, according to the general fall or pitch of the box, riffles B, of upper rounded configuration, are arranged across the bottom of the box. Immediately below each of these riffles the bottom of the sluice-box is cut out for a distance of from one to about three feet in length, more or less, and a quicksilver-tight box, C, projecting from and below the bottom of the sluice-box and open above, is substituted for such cut-out portion of the sluice-box. These boxes C are of a reverse inclination to that of the sluice-box, varying in degree as the character of the ore changes, but in every instance being deeper at what may be termed their "upper end" relatively to the sluice-box. Above each of these "false boxes," as they may be termed, at the bottom of the riffles, and resting on cleats *b*, secured to the sides of the sluice-box, is a double perforated plate, D, composed of duplicate plates *d d*, of either copper or iron, insulated from each other, as at *c c*. Said double plate is set inclining upward in a downward direction of the sluice-box, leaving a mouth-opening, *e*, at its raised end between the sluice-box and the false box. The perforations in said double plate are preferably of increasing size below to give a ready clearance and prevent clogging by clay, &c.

In the bottom of each false box C is an insulated amalgamated copper plate, E; or the boxes C may have an entire amalgamated copper lining, if desired. In these boxes C the quicksilver is placed, and their upper and lower plates, D E, are insulated, as described, when it is desired to use an electrical current to expedite and improve the work, the one plate D, or perforated lower plate, *d*, thereof, being connected, as by a wire, *f*, with one pole of a battery, and the bottom plate E, as by a wire, *g*, with the other pole thereof.

The riffles B, which may either be made hollow of plates, or solid, may be of any height, and, being rounded, material will pass over them in better shape than it would over an inclined plane, and will give a force of fall that will effectually secure the amalgamation of fine gold by bringing it in contact with the quicksilver.

The boxes C in the bottom of the flume or sluice-box, it will be observed, are fixed ones, and the upper perforated plate D and lower incline plate E, with the quicksilver resting on the latter, will effectually secure the necessary amalgamation, give a proper distribution of the sand over the surface of the amalgamating-chambers, and all fine gold, floured quicksilver, and amalgam will be saved.

The inclined plates E in the bottom of the boxes C may be used for concentrating the ores, and the mouths *e* and position or arrangement of said fixed boxes C with their inclined bottoms will serve to provide for the apparatus clearing itself of dirt falling through into it.

The amalgamation is not dependent upon the mere specific gravity of the precious metals, but is a forced one, thus saving not only the coarser particles of gold, but all "float" gold that otherwise is liable to be washed away with the stream.

The succession of amalgamating chambers and plates will be found especially serviceable where the stream is a heavy one, as any precious metal that failed to go through the first

perforated plate would go through the next succeeding ones.

Instead of the upper perforated plate D being set to incline reversely to the general bottom of the sluice-box, it may be set parallel therewith, but at a higher level than it, leaving the same mouth or outlet *e*.

When electricity is applied to promote the amalgamation, the plate D, by being made a compound one, as described, and connected as regards its lower insulated plate *d*, directly or indirectly with the positive pole of the battery, and the bottom amalgamated plate, E, with the negative pole thereof, the electric current will be confined to the stream passing through the fixed boxes and not be scattered or have its force impaired by passing through the water in the entire box. When the stream is passing through the fixed boxes, and the lower plate E is charged with negative electricity, and the lower one of the upper plates, D, with positive electricity, the precious metals—gold, silver, &c.—are attracted to the negative, the bottom plate, and the base, &c., are attracted by the lower upper one of the plates *d*, and the water falling through completes the circuit. Only certain of the boxes C may thus be charged, or the whole of them, as desired.

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

1. The combination, with the flume or sluice-box A, having a series of openings at distances apart in its bottom, of the close fixed lower quicksilver-boxes, C, arranged to close said openings, and having a reverse inclination to the sluice-box, the bottom plates, E, within said lower boxes, of reverse inclination to the bottom of the sluice-box, and an upper perforated plate parallel, or thereabout, with the plate E, and arranged to form or leave an outlet, *e*, at its raised end in communication with the sluice-box, substantially as specified.

2. The combination of the rounded riffles B with the inclined sluice-box or flume A, having openings at distances apart in its bottom, the fixed quicksilver receptacles or boxes C, having their bottom inclined in a reverse direction to that of the sluice-box, the fixed lower solid plates, E, and the upper perforated plates, D, essentially as described.

3. The compound upper perforated plates, D, composed of upper and lower insulated plates, *d d*, the lower one of which is an electrical plate connected with the positive pole, the lower insulated electrical plate, E, connected with the negative pole, the fixed boxes C, and the sluice-box A, having openings closed by said boxes C, substantially as and for the purpose herein set forth.

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