

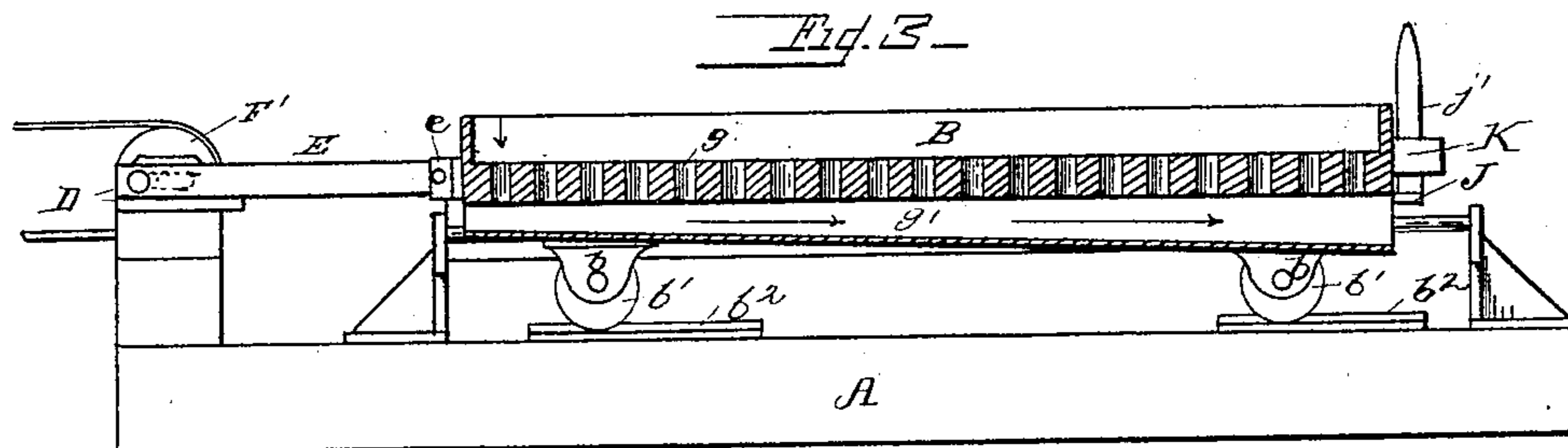
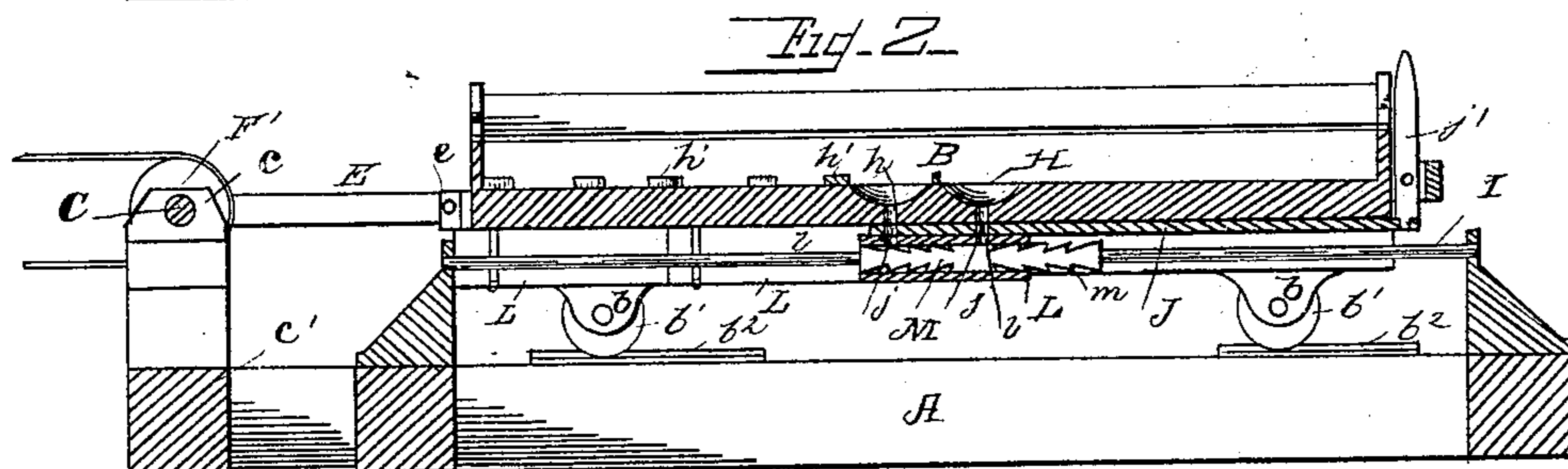
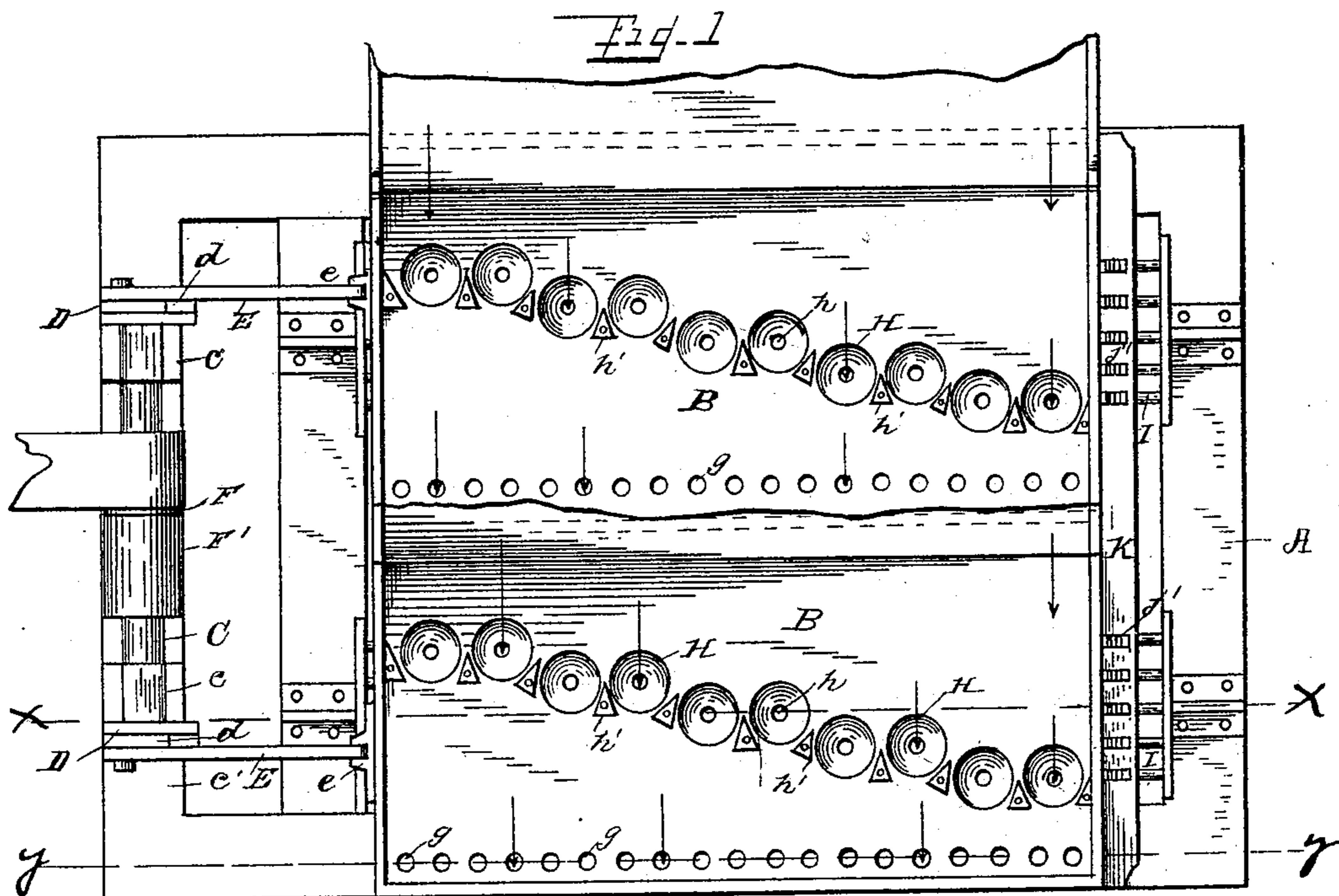
(No Model.)

J. D. COPLEN.

ORE CONCENTRATOR AND AMALGAMATOR.

No. 390,755.

Patented Oct. 9, 1888.



Witnesses.

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ORE CONCENTRATOR AND AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 390,755, dated October 9, 1888.

Application filed July 6, 1887. Serial No. 243,577. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. COPLEN, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Ore Concentrators and Amalgamators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in combined ore concentrators and amalgamators, such as are used to concentrate the ores of gold and silver and separate the metal therefrom; and its main objects are to rapidly and effectually separate the metallic particles from the gangue and other refuse, and to adapt the machine to act as an amalgamator, if desired.

The invention consists in the construction and novel arrangement of parts hereinafter described, illustrated in the drawings, and pointed out in the claims hereto appended.

In the drawings accompanying and forming part of this specification, Figure 1 is a plan view of the invention. Fig. 2 is a section on the line *x x*, Fig. 1; and Fig. 3 is a section on the line *y y* of Fig. 1.

Referring to the drawings by letter, A designates the base of the machine, of general rectangular shape, inclined at a suitable angle in the usual way.

B designates a rectangular, shallow separating table or shaker, into which the pulp is poured. The said separating-table has secured to it the brackets *b b*, to which are pivoted the wheels *b' b'*, which travel on suitable rails, *b² b²*, secured to the end beams of the base, so that the table can be reciprocated transversely on the base. The table is reciprocated by the following means:

C is a shaft journaled in bearing blocks *c c*, secured to the side beam, *c'*, of the base-frame; and D D are crank-disks secured to the ends of the said shaft outside of its bearings. These crank-disks may be provided with dovetail grooves for the reception of blocks, as *d*, to provide for adjusting the cranks, according to the length of thrust desired, in a well-known way.

F and F' are respectively fast and loose pulleys on the shaft C. A belt from any proper

source of power passing over the pulley F will rotate the shaft C, and by means of the cranks and pitmen will reciprocate the table.

The separating-table B is surrounded by a retaining-flange, as shown in Figs. 2 and 3, and is divided by transverse partitions into similar compartments. Each compartment is provided adjacent to its lower end with the transverse series of openings, *g g*, which communicate with the trough or chute *g'*, secured beneath the bottom. This chute is inclined downward to the side opposite that on which the shaft C is situated.

H H are depressions in the surface of the chamber, preferably circular in contour, from which lead the openings *h* through the table. The depressions H are situated at points in the chamber above or in front of the openings *g* and incline across the compartment, and they are preferably arranged in pairs, the members of each of which are equally distant from the openings *g*, as seen in Fig. 1.

h' h' are triangular deflecting-blocks secured to the surface of the compartment between each of the depressions H. The said blocks have their apexes about midway between the depressions, so that their sides will tend to deflect the heavier particles of pulp into the latter.

I I are guide-bars secured transversely across the bed-frame, their ends being secured in standards rising from the side beams thereof. Each bar passes centrally below one of the pairs in the series of depressions, so that when there are five such pairs, as shown in Fig. 1, there will be five bars, I, under each compartment.

J J are cut off slides, one of which rests against the bottom of the compartment under each pair of depressions, and is provided with openings *j j*, which register with the openings *h h*. The outer ends of the said slides are connected with the ends of the lower arms of the levers *j'*, which are themselves pivoted in vertical openings made in a bar or beam, K, secured to the side of the table opposite the shaft C. By means of the said levers the openings *j* and *h* may be made to correspond in position, or may partly overlap each other, so as to lessen the discharge from the depressions H; or the slides may be moved so as to cut off all discharge therefrom. L L are receiving-

cases secured below the compartments, one under each pair of depressions, and have in their upper surfaces the openings *l l*, which correspond in position with the openings *h h*.

5 Each slide *J* moves in a suitable guide-groove, so that when the slide is in position the openings *j*, *h*, and *l* will correspond and the depressions will discharge into the cases.

10 *M M* are discharging-blocks, each of which is secured to a guide-bar, *I*. The blocks *M* are provided with the shoulders *m m* on their surfaces, as seen in Fig. 2. The cases reciprocate back and forth on the blocks when the table is actuated.

15 The mode of operating the machine is as follows: The slides *J* are set so as to cut off all discharge from the depressions *H*. The table is set in motion by the described means, and the pulp and water fed to the compartments 20 above the depressions by means of troughs or chutes in a well-known way. As the pulp passes between the blocks *h'*, its heavier parts are deflected thereby into the depressions *H*, while the lighter floating refuse passes down 25 to the openings, through which it is discharged into the troughs *g'*, and thence away from the machine. Whenever desired, the cut-off slides are so moved as to allow the depressions to feed into the cases below, whence the concentrates are forced out of the machine by the dis- 30 charging-blocks as the cases reciprocate thereupon and are deposited in suitable receptacles. The rapidity of feed can, as explained, be regulated by the cut-off slides.

35 If desired, the holes *h*, *j*, and *l* may be made larger for some compartments, so that different grades of pulp may be treated in each. By introducing mercury into the depressions and cutting off the discharge therefrom by 40 means of the slides till the mercury forms an amalgam with the metal in the pulp and then

allowing the amalgam to escape through the openings *h* the machine becomes an amalgamator.

It is remarked that by removing the parti- 45 tions and dispensing with the discharge openings and spouts at the foot of each compartment the machine will operate to grade the concentrates to any desired degree. The pulp being fed at the head of the table and caused 50 to pass over all or over a series of rows of cups or depressions, the heavy mineral constituents will be successively caught in the cups according to the relative specific gravity, while the gangue and worthless matter will be dis- 55 charged at the tail of the machine.

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

1. An ore concentrator and amalgamator 60 comprising a laterally-reciprocating tray or table provided with discharge-openings at its foot, a series of circular depressions having central discharge-openings, said depressions being arranged in pairs and said pairs being 65 arranged diagonally across the table, and triangular deflectors, substantially as described.

2. An ore concentrator and amalgamator comprising a laterally-reciprocating tray or 70 table provided with discharge-openings at its foot and a series of circular depressions having central discharge-openings, said depressions being arranged in pairs and said pairs being arranged diagonally across the table, 75 substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN D. COPLEN.

Witnesses:

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