

(No Model.)

2 Sheets—Sheet 1.

A. F. W. PARTZ.

APPARATUS FOR TREATMENT OF GOLD ORES BY DRY AMALGAMATION.

No. 535,017.

Patented Mar. 5, 1895.

Fig. 3.

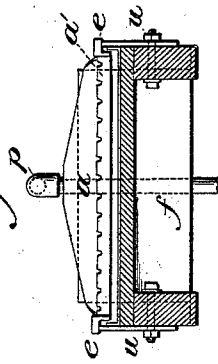
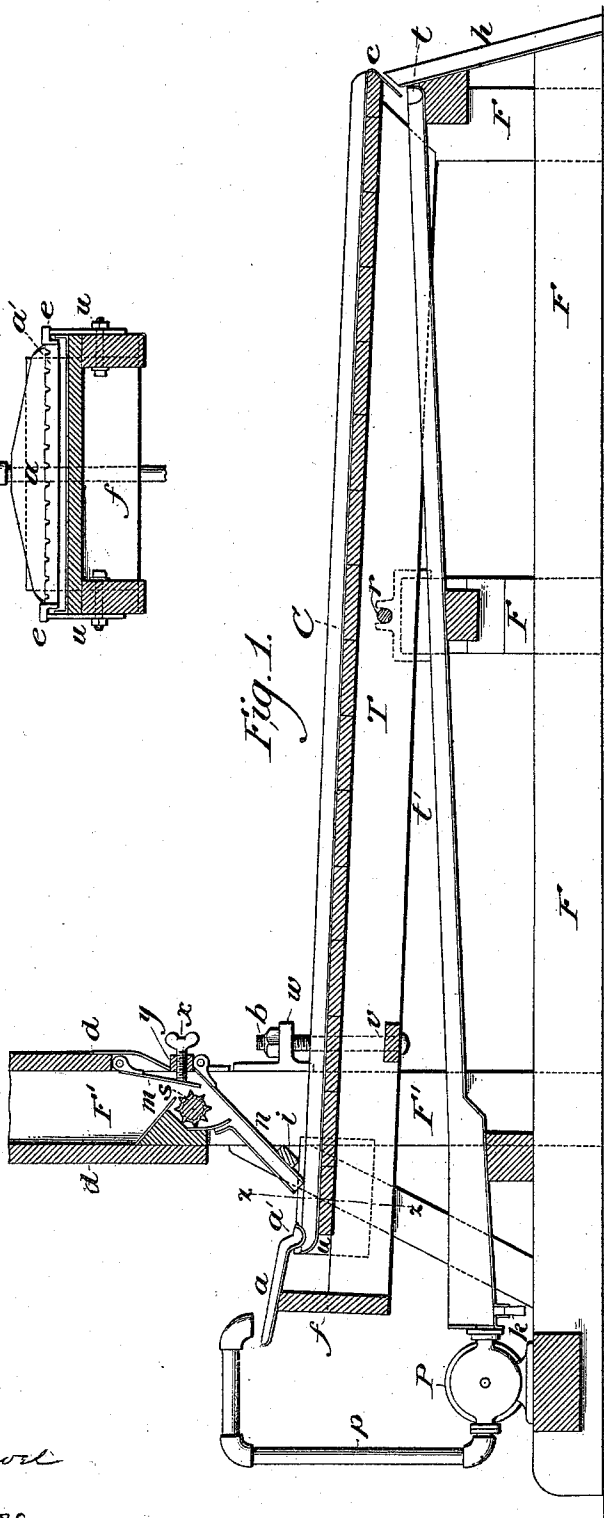


Fig. 1.



WITNESSES:

Howard Ford
Frank Loge.

INVENTOR.

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(No Model.)

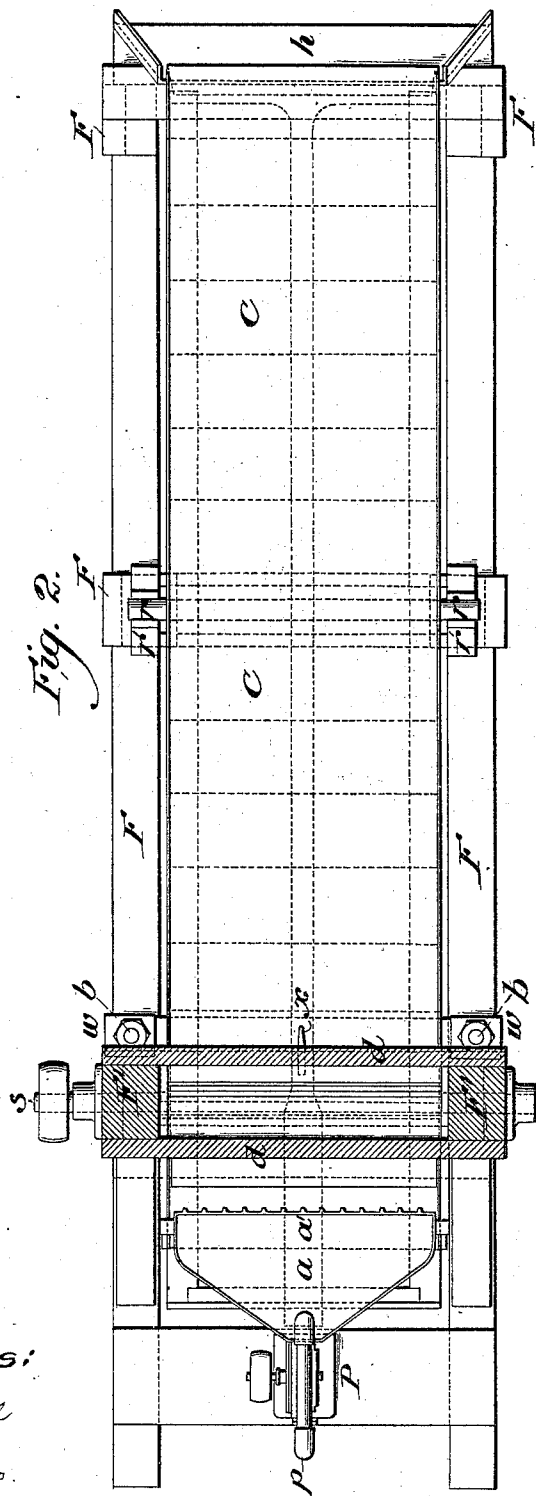
2 Sheets—Sheet 2.

A. F. W. PARTZ.

APPARATUS FOR TREATMENT OF GOLD ORES BY DRY AMALGAMATION.

No. 535,017.

Patented Mar. 5, 1895.



WITNESSES:
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Frank Logo.

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UNITED STATES PATENT OFFICE.

AUGUST F. W. PARTZ, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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APPARATUS FOR TREATMENT OF GOLD ORES BY DRY AMALGAMATION.

SPECIFICATION forming part of Letters Patent No. 535,017, dated March 5, 1895.

Application filed August 2, 1892. Serial No. 441,927. (No model.)

To all whom it may concern:

Be it known that I, AUGUST F. W. PARTZ, a citizen of the United States, residing at Philadelphia, in the State of Pennsylvania, have invented certain Improvements in Apparatus for the Treatment of Gold Ores by Dry Amalgamation, of which the following is a full and exact description, reference being had to the accompanying drawings.

These improvements relate particularly to a dry amalgamator for which Letters Patent, bearing the number 39,240, were granted to me on the 14th day of July, 1863.

The objects of my present invention are to provide more efficient means than those heretofore employed for obtaining a continuous and even distribution of pulverized ore upon a sheet of mercury flowing down an inclined plane; to effect a separation of the tailings from the mercury without the aid of water, the need of which for that purpose was an objectionable feature of the said patented amalgamator, and to turn the great affinity of sodium amalgam for gold to actual advantage.

The invention consists, first, in an adjustable device, hereinafter specified, for discharging pulverized ore from a bin in a continuous stream of certain dimensions upon flowing mercury; secondly, in an amalgamated sheet of copper forming an inclined plane and having its lower end bent down and back to an angle of about forty degrees from a vertical line at the bend, so that mercury flowing down the sheet will adhere to it by molecular attraction till it flows off at the edge into a trough, while the tailings of ore floating upon the mercury fall down at the bend and are thus automatically separated; thirdly, in the combination, with a stationary inclined sheet of copper, of a moving sheet of a fluid compound of mercury and sodium which, while flowing down the incline, takes up the gold from pulverized ore distributed over its surface and is continually renewed by a re-elevation of its substance to the upper end of the incline after its discharge at the lower end.

In the drawings hereto annexed Figure 1 is a longitudinal vertical section, Fig. 2 a top

view, and Fig. 3 a partial transverse vertical section (in the plane of the dotted line $z z$ in Fig. 2) of an apparatus embodying my invention.

A table, T, made of two joists and a row of boards which are covered with a sheet of copper, C, is suspended on a wooden framework, F, F', by means of an iron rod, r , passing through the joists and resting in bearings r' , and of an iron bar, v , and two pendent bolts, b , which are held by brackets, w , fastened to the uprights F', and by turning the nuts of which the inclination of the table can be regulated. The copper sheet C is amalgamated, best with mercury alloyed with sodium, and a narrow strip of it is turned up along its sides and upper end. Near its lower end it is bent down and back as shown at c in Fig. 1.

P is a rotary pump for raising the mercury (whether alloyed with sodium or not) employed in the apparatus and kept in constant circulation while work is going on. Discharged from the pipe p upon an apron, a , it falls from a row of lips along the rim of a trough, a' , joined to the apron, upon the sheet C, descends the same and returns by the troughs t and t' to the pump, near which the trough t' is sufficiently enlarged to hold all that may be on its way to the pump when the latter is stopped. The apron a which, like the trough a' , should be of copper, is supported by a board, f , fastened to the table T, and to the ends of the trough a' are fixed angular pieces of brass, e , by which it rests upon the edges of two iron plates, u , bolted to the table.

The uprights F' and boards d form a receptacle for the auriferous ore under treatment as it comes from a pulverizing machine. A grooved or ribbed shaft, s , to be turned at a moderate speed by power applied to an outer pulley, a suspended plate of iron, m , hinged to the uprights F', and a set screw, x , in a bar of iron, y , fastened to the said uprights, are the essential components of a device for procuring a continuous and uniform discharge of a certain quantity of ore in a given time, which to regulate it is necessary only, after a suitable speed has been given to the shaft s , to either widen or narrow the space between it

and the plate *m* by means of the screw *x*. The ore falls upon and slides down an inclined iron plate, *n*, under a sheet iron cover. This plate is, like *m*, hinged to the uprights *F'*, and to it is riveted an iron bar, *i*, the ends of which rest upon the edges of the plates *u*, so that the position of the plate *n* will not be materially affected by such small changes in the inclination of the table *T* as may be found necessary.

Provision having been made for a complete regulation of the apparatus regarding quantity and speed of the materials set in motion, the respective parts must be so adjusted that the mercury falling from the lips of the trough *a'* upon the incline *C* spreads into an unbroken lightly flowing sheet, that the pulverized ore falling upon the latter from the plate *n* forms a thin and even layer, and that its passage down the incline allows sufficient time for its taking up the gold, the absorption of which is aided by the motion of the mercury causing the particles of ore to shift and change their points of contact. Reaching the bend at *c* the mercury adheres by molecular attraction to the copper sheet till it flows from its edge into the trough *t*, while the tailings, following simply the law of gravitation, fall straight down upon an inclined screen, *h*. When the mercury has become well charged with gold amalgam, it may be drawn off by removing a plug, *k*, in the bottom of the trough *t'*, to be subjected to the usual process of straining.

With all the mercury, sodium should be incorporated, regarding the amount of which it may be said: the more the better—so long as the mass remains perfectly fluid. The great affinity of sodium-amalgam for the precious metals is well known and many attempts have been made to take advantage of it in wet amalgamation, but without success, as sodium is readily oxidized by water. Since I have dispensed with the use of water even for the separation of the tailings, the application of

sodium in my dry amalgamator becomes entirely practicable and a matter of vital import.

In case it be desired, for the sake of working more expeditiously, to have the layer of ore upon the mercury better agitated than by the mere motion of the latter, it may be made to pass through rows of pins projecting from strips of wood placed across the table, or pieces of cloth may be suspended so as to sweep lightly over the ore.

Though I have spoken only of the extraction of gold from ores, it is apparent that the same apparatus may be applied in like manner and with equal advantage to the extraction of gold and silver contained in the sweepings from mints and shops of workers in precious metals, as also to the collection of "floured" mercury from tailings of ores treated by different metallurgical processes.

Having thus described my invention, I claim as new—

1. The combination of an inclined copper conduit having its lower end bent downward and backward from a vertical line, a receiver below the lower edge and the receiver within such vertical line whereby the adhering mercury is re-collected while the ore tailings escape vertically at the bend, substantially as set forth.

2. The combination of a stationary inclined copper conduit having its lower end bent downward and backward from a vertical line, a receiver beneath the lower edge and within such vertical line, whereby the adhering mercury compound is re-collected while the ore tailings escape vertically at the bend, and a return conduit and elevator for re-conveying the mercury compound to the upper end of the copper incline, substantially as specified.

AUGUST F. W. PARTZ.

Witnesses:

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