

(No Model.)

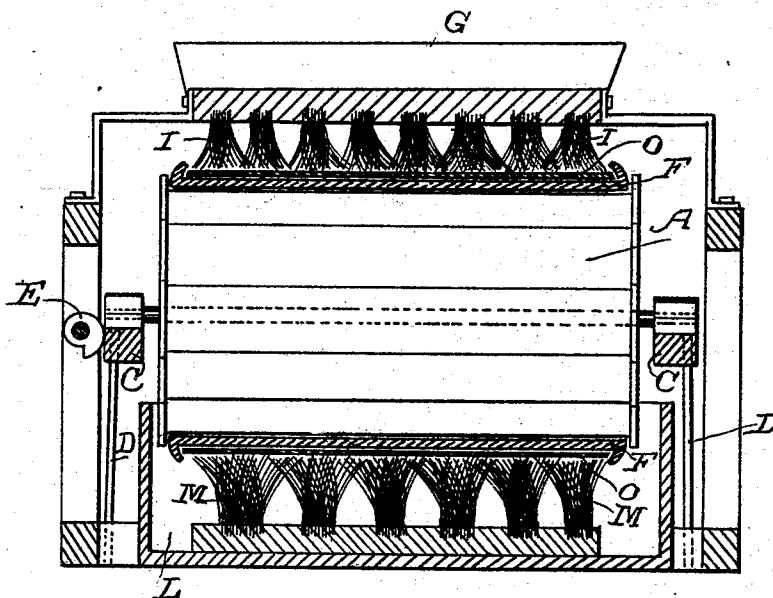
2 Sheets—Sheet 2.

J. S. JOHNSON.
AMALGAMATOR.

No. 503,765.

Patented Aug. 22, 1893.

Fig. 3



Witnesses,
B. H. Morse
J. A. Bayless

Inventor
Joseph S. Johnson
By Dewey & Co.
Atty

UNITED STATES PATENT OFFICE.

JOSEPH S. JOHNSON, OF SAN FRANCISCO, CALIFORNIA.

AMALGAMATOR.

SPECIFICATION forming part of Letters Patent No. 503,765, dated August 22, 1893.

Application filed April 17, 1893. Serial No. 470,725. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH S. JOHNSON, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Amalgamators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for amalgamating materials containing valuable or precious metals.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal, vertical section. Fig. 2 is a top view of the same. Fig. 3 is a transverse vertical section.

The object of my invention is to provide an apparatus by which heavy material may be separated from lighter gangue with which it is mixed, and by which any valuable or precious metal which may be contained in the material may be amalgamated or saved.

A and B are two rollers or drums having a proportion of about four feet in length, the upper one A being about two feet in diameter and the drum B about one foot. These are journaled in a frame-work C which is supported upon arms D, or suspended so that this frame-work and the drums carried by it may be given a horizontal shaking motion by means of a cam E, or other suitable equivalent device.

Around the drums A and B passes a belt F which may be of rubber, canvas, or other suitable material, and the rollers are so journaled with relation to each other that the lower sides of the rollers are approximately level, and the upper side of the head roller is higher than that of the roller B by reason of its greater diameter. This produces an inclination of the upper part of the belt, and the drums are rotated by any suitable connecting mechanism, not here shown, so that the belt travels constantly up the incline, the angle of which may be adjusted to suit the sand or pulp to be worked. Transversely across this belt are fixed plates O having silvered or amalgamated surfaces. These plates are a little shorter than the full width of the belt and are attached by one edge only, that edge

being the one toward the line of travel. Each plate may be about four or five inches in width, and they overlap each other like the clapboards of a house. The surfaces of these plates being amalgamated, as before described, enables them to catch and retain any quicksilver or gold, or other valuable metal which may be contained in the material which is delivered upon the belt from a head box G which is situated near the upper end of the belt.

H is a nozzle so constructed as to discharge a sheet of water upon the upper end of the belt, the water flowing down toward the lower end and mingling with the material which is delivered from the head box, as it flows.

The side shaking motion of the belt distributes the material, the heavier parts settling to the bottom, and the lighter flowing off gradually over the top, and being eventually discharged over the drum at the lower end of the machine.

In order to keep the surfaces of the plates bright and clean, and to cause a proper contact of all the material with these plates, I employ brushes I which are suitably fixed above the upper surface of the moving belt and plates, so that the ends of the brushes are in contact with the surface as it moves. The sand or pulp is delivered upon the plates above the point where the brushes are located, and the pulp then flows beneath the brushes.

The upward travel of the belt and the side shaking motion cause the brushes to constantly rub the plates, thus preventing them from becoming oxidized and keeping the mercury bright and well distributed, so that it is always in readiness to retain any fine particles of metal which may come in contact with it.

In order to keep the plates approximately flat against the surface of the belt as they pass around the drums, I have shown the drums made polygonal in form, the surfaces being approximately of the same width as the width of the plates, so that in passing around the drums, each plate will lie upon one of the surfaces. At intervals along the belt are formed projections or lugs J and corresponding depressions K are made in the drums into which these lugs fit while the belt is passing around

the drum, thus preventing it from slipping, and insuring the registration of the plate with the flattened surfaces.

The edge of the belt to which the plates are attached is upturned, as shown at F', and while the belt is passing along the straight portion between the drums, this upturned flange serves to retain the material upon the belt and prevent its flowing off to either side. When the belt bends to pass around the rollers, these upturned flanges turn inwardly as shown in cross section, and slightly overlapping the ends of the plates, they retain them in contact with the belt and the roller while passing around the drums. After the plates have passed around the drum at the upper end and are released by the straightening up of the flanges F', they turn a little about their hinged edges and incline downwardly into a tank L containing water through which they pass while returning from the upper to the lower drum on the lower side. Within this tank L is fixed another series of brushes M so that their upper ends will form contact with the plates as they pass, and brush off any free mercury or amalgam which may be upon the plates, also any verdigris, or other material which may adhere, thus leaving them free and clean to again receive the pulp and material when they arrive at the upper part of their travel.

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

1. An apparatus consisting of the endless traveling belt, horizontally journaled drums around which the belt passes with an inclination of its upper surface, metallic overlapping plates fixed upon the belt and movable therewith, means for supplying pulp and water at the upper end of the belt, a tank situated beneath the belt into which the plates dip and wherein they are cleansed while returning beneath the rollers, substantially as herein described.

2. An apparatus consisting of drums horizontally journaled in a frame, mechanism

whereby a side shaking motion is imparted to said frame, an endless traveling belt passing around the drums having the upper surface inclined, metallic overlapping plates attached to the belt by one edge, means for supplying pulp and water upon the upper end of the belt, and brushes secured above the belt so that the ends form a contact with the plates as they pass beneath the brushes and a washing tank situated beneath the belt, substantially as herein described.

3. An apparatus consisting of horizontally journaled drums mounted in a frame, and mechanism whereby a side shaking motion is imparted to the frame and drums, an endless traveling belt passing around the drums with the upper surface inclined, metallic overlapping plates extending transversely across the belt and attached thereto by one edge, upturned edges upon each side of the belt, inclining inwardly and adapted to fold down over the edges of the plates by the tension produced by passing around the drums at the upper and lower ends, whereby the plates are retained in contact with the belt until they have passed around the drum, substantially as herein described.

4. An apparatus consisting of an endless traveling belt passing around drums horizontally journaled upon a frame to which a side shaking motion is imparted, metallic plates extending transversely across the belt, overlapping each other, having their upper edges attached to the belt, brushes secured above the belt with their ends in contact with the plates as the latter pass beneath them, a washing tank into which the belt dips as it returns on the lower side, and brushes fixed within said tank so as to brush the surfaces of the plates as they pass through the tank, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOSEPH S. JOHNSON.

Witnesses:

S. H. NOURSE,
WM. F. BOOTH.