

(No Model.)

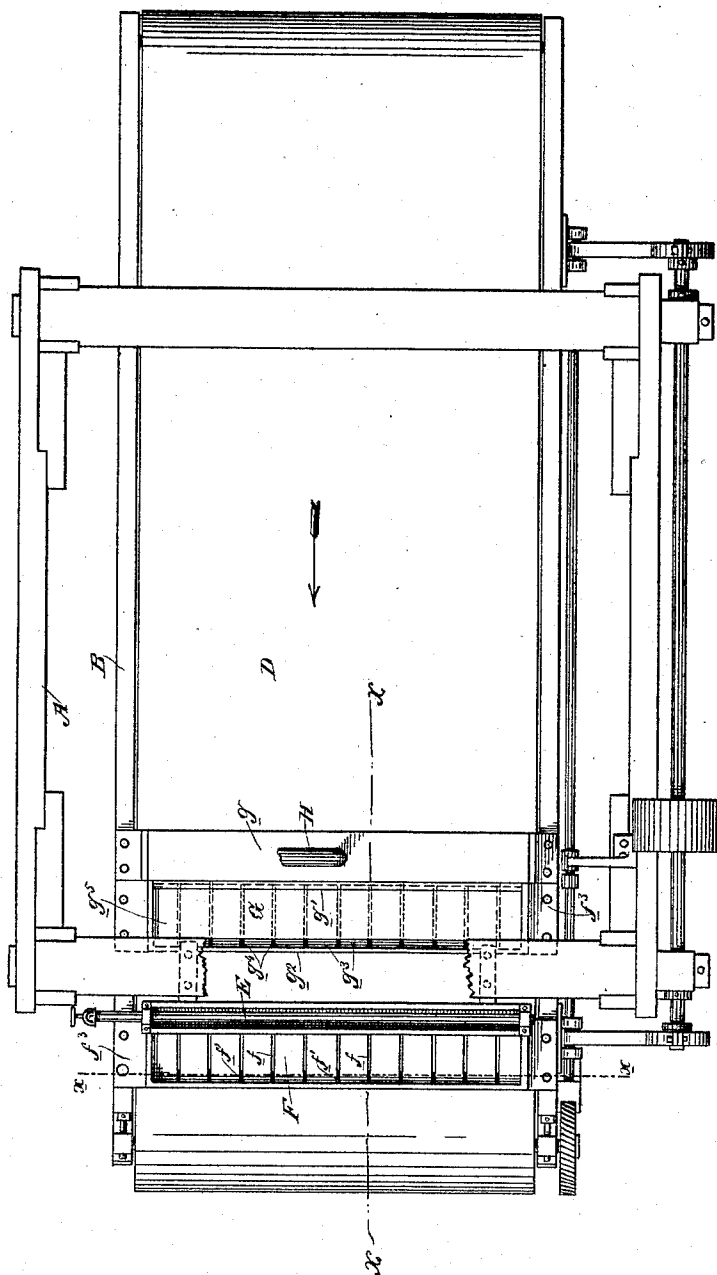
2 Sheets—Sheet 1.

G. JOHNSTON.  
ORE CONCENTRATOR.

No. 489,744.

Patented Jan. 10, 1893.

Fig. 1.



Witnesses,  
J. H. House  
F. E. Aschbeck

Inventor  
George Johnston  
By Dewey & Co. atty

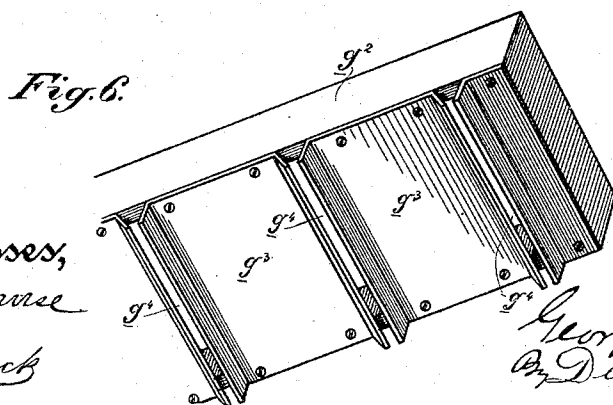
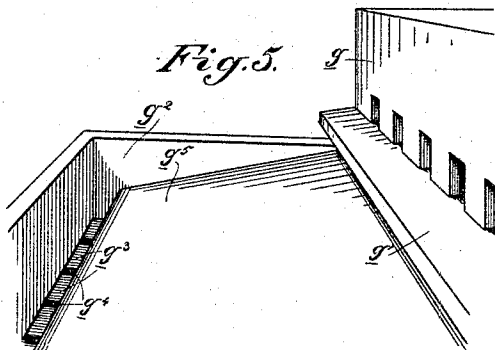
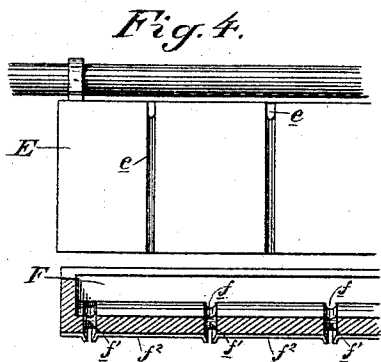
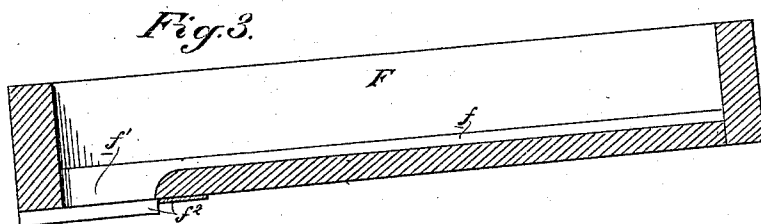
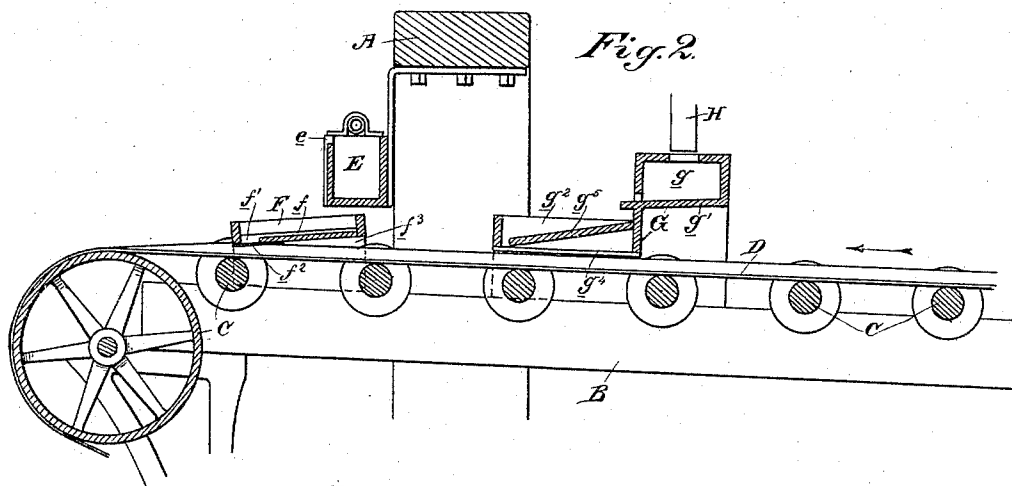
(No Model.)

2 Sheets—Sheet 2.

G. JOHNSTON.  
ORE CONCENTRATOR.

No. 489,744.

Patented Jan. 10, 1893.



Witnesses,  
B. A. Mace  
J. S. Aschbeck

Inventor,

George Johnston  
By Dewey & Co. attys.

# UNITED STATES PATENT OFFICE.

GEORGE JOHNSTON, OF SAN FRANCISCO, CALIFORNIA.

## ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 489,744, dated January 10, 1893.

Application filed January 29, 1892. Serial No. 419,689. (No model.)

*To all whom it may concern:*

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

My invention relates to that class of ore concentrators in which the concentrating surface is a traveling belt.

My invention consists in the novel improvements in the pulp and water distributors, hereinafter fully described and specifically pointed out in the claims.

The objects of my invention are, first, to distribute the pulp upon the belt in narrow channels in the direction of its travel, and as close to it as possible, leaving wide spaces upon the belt between the discharge courses, where the sulphurets can remain undisturbed by any fall of water or sand, and pass up to the clear water at the head of the belt, the sands at the same time passing down in the same channels without obstruction to the foot of the belt; second, to deposit the clear water in the same channels on the belt, from a platform or board having narrow slots in the line of said channels, and so arranged as to discharge the water without pressure and with the least possible splash.

Referring to the accompanying drawings for a more complete explanation of my invention,—Figure 1 is a plan of a concentrator showing the application of my distributors thereto. Fig. 2 is a vertical section of same, on the line  $x-x$ . Fig. 3 is a cross section of the water distributor board or platform. Fig. 4 is a vertical section on line  $x-x$  of Fig. 1. Fig. 5 is a perspective view of the pulp distributor. Fig. 6 is a bottom view of the lower portion  $g^2$  of the pulp distributor.

My improvements though applicable to any form of traveling belt concentrating table, are especially intended for use with those concentrators in which is employed an endless traveling belt, carried at a slight inclination by a shaking frame and traveling up the incline, whereby the heavier and precious particles of the pulp fed upon it are carried

up around its head drum, while the lighter and worthless particles are swept down by the current to the foot of the belt. Accordingly I have illustrated a machine of this class of which A is the main frame, B is the shaking frame carrying the rollers C, and D is the traveling belt. It is unnecessary to particularly describe the construction of these and surrounding parts as they are now well known and it is sufficient to say that the belt frame is given a shaking motion, while the belt travels up the incline.

In concentrating gold ores, the most important consideration is to disturb the surface of the table or belt as little as possible, by the drop of the pulp from the battery, and the fall of the clear water at the head of the table. At the present time the pulp is generally discharged from an apron across the front of the pulp box, usually in a shallow continuous stream, and also in a number of streams some distance from each other across the width of the belt. The pulp and the water where they strike the belt disturb and remove the sand and sulphurets, and these have to again find a resting place on the belt. This is a decided detriment to the operation of the machine. To avoid this disturbance I have the following construction of the pulp and water distributors. E is a stationary water receptacle supported by the fixed main frame of the machine, and extending transversely over the head of the belt. It is provided with a series of outlets  $e$ . F is the water distributor consisting of a board or platform, or as here shown, a shallow open-topped frame, in the bottom of which are made the transverse parallel narrow grooves  $f$ , the lower ends of which communicate with narrow elongated slots  $f'$  which may be formed in any suitable manner. They are here shown as formed by underlying plate sections  $f^2$  separated to make the slots between them. These slots lie in line with the direction of travel of the belt. This distributor board, frame or platform is supported from the shaking frame B of the machine, in any suitable manner, as by end brackets  $f^3$ , whereby it moves with said frame, and consequently maintains its discharge slots  $f'$  in a fixed position over the

underlying belt. The board or frame F is located under the outlets *e* of the fixed water receptacle, so that the water is delivered upon or into it and flows into grooves *f*, and said grooves have sufficient capacity to confine and pass all the water received upon said board or frame, down into the discharge slots *f'* without splash or pressure.

G is the pulp distributor box. This is also supported from the shaking frame B so that it moves with it. This box consists of two compartments or portions, the one *g* having a raised plain bottom *g'*, and the other *g*<sup>2</sup> having a bottom *g*<sup>3</sup> in a lower plane, and provided with a series of separated parallel transverse narrow and elongated slots *g*<sup>4</sup>, which lie in line with the travel of the belt, close to its surface, and may be formed in any suitable manner as by composing the bottom *g*<sup>3</sup> of a number of separated plate sections. In the portion *g*<sup>2</sup> is located an inclined directing board *g*<sup>5</sup> raised above the bottom *g*<sup>3</sup> and narrower than said bottom, so that the pulp delivered from the bottom *g'* of the upper portion upon said board will flow down to its lower edge, and be delivered upon the slotted bottom *g*<sup>3</sup> at its end nearest the head of the table, whereby it can spread equally out over said bottom, which is slightly inclined downwardly toward the foot of the table, owing to the general inclination of the shaking frame B. The pulp can, therefore, flow freely through the slots *g*<sup>4</sup> and throughout their entire length. It is the ore spout leading down into the upper portion *g* of the pulp distributor box. By this construction of pulp box, I drop the pulp not indiscriminately across the belt, but only in specified definite places, through the narrow slots. It is thereby deposited in narrow channels on the belt, and being close to its surface it falls without much splash or disturbance. A large portion of the surface of the belt is undisturbed by the fall of the pulp; and the sulphurets working to each side of the line or channels in which they were deposited form in parallel rows in the spaces between said lines or channels, and ascend to the clear water at the head of the table. The sand particles have no splash to obstruct their downward flow but pass down the same channels or lines to the foot of the belt. The clear water is similarly applied. It falls gently, without pressure, and with as little splash as possible, and directly into or upon the same channels, or lines in which the pulp was deposited, said lines or channels being bare by the time the water discharges are reached, occasioned by the working of the sulphurets into the parallel side rows and the downward flow of the sand. The slots in the pulp box and water board or frame are arranged in line to effect this deposit of the pulp and the water in the same lines or channels. The sulphurets formed in rows between the discharges from the sand or pulp distributor are not disturbed by the clear water dis-

charge and pass on over the head of the table on the same portion of the belt on which they first settled. As a result of my construction, about two-thirds of the belt is undisturbed by any splash of sand or water, and the capacity of the belt is greatly increased and much cleaner work is done.

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

1. In an ore concentrator having a traveling belt, a water distributor board or platform above the belt having in its surface a series of directing grooves, and a series of narrow slots with which said grooves communicate, said grooves and slots lying in line with the direction of travel of the belt, whereby the water is delivered gently and in narrow channels on the surface of the belt, substantially as herein described.

2. In an ore concentrator and in combination with its traveling belt, a water distributor board or platform, and a separate pulp distributor box, each lying over the belt and each having in its bottom a series of narrow elongated discharge slots, in line with the direction of travel of the belt and one series being in line with the other whereby the pulp and water are delivered upon the belt in the same narrow channels, substantially as herein described.

3. In an ore concentrator having a traveling belt, a pulp distributor box lying over said belt and having in its bottom a series of narrow elongated discharge slots in line with the direction of travel of the belt, and a water distributor board or platform lying over said belt at a point between the pulp distributor box and the head of the belt, and having in its bottom a series of directing grooves and elongated narrow discharge slots communicating with said grooves, said slots being in the line of the belt travel and in line with the discharge slots of the pulp distributor, whereby the water and pulp are delivered to the belt in the same narrow channels, substantially as herein described.

4. In an ore concentrator having a shaking frame and a traveling belt carried thereby, a pulp distributor box secured to the frame and lying over the belt, and having in its bottom a series of narrow elongated discharge slots in line with the belt travel, and a water distributor board or platform lying over the belt and secured to the shaking frame at a point between the pulp distributor box and the head of the belt, and having in its bottom a series of directing grooves and elongated narrow discharge slots with which said grooves communicate, said slots being in line with the belt travel and with the slots of the pulp distributor whereby the water and pulp are delivered to the belt in the same narrow channels, substantially as herein described.

5. In an ore concentrator, the pulp dis-

tributer box consisting of an upper portion  
with a plain bottom, and a lower portion  
with a bottom provided with a series of nar-  
row elongated discharge slots, and the di-  
recting board in the lower portion and over  
5 its slotted bottom, substantially as herein de-  
scribed.

In witness whereof I have hereunto set my  
hand.

GEORGE JOHNSTON.

Witnesses:

S. H. NOURSE,  
J. A. BAYLESS.