

(No Model.)

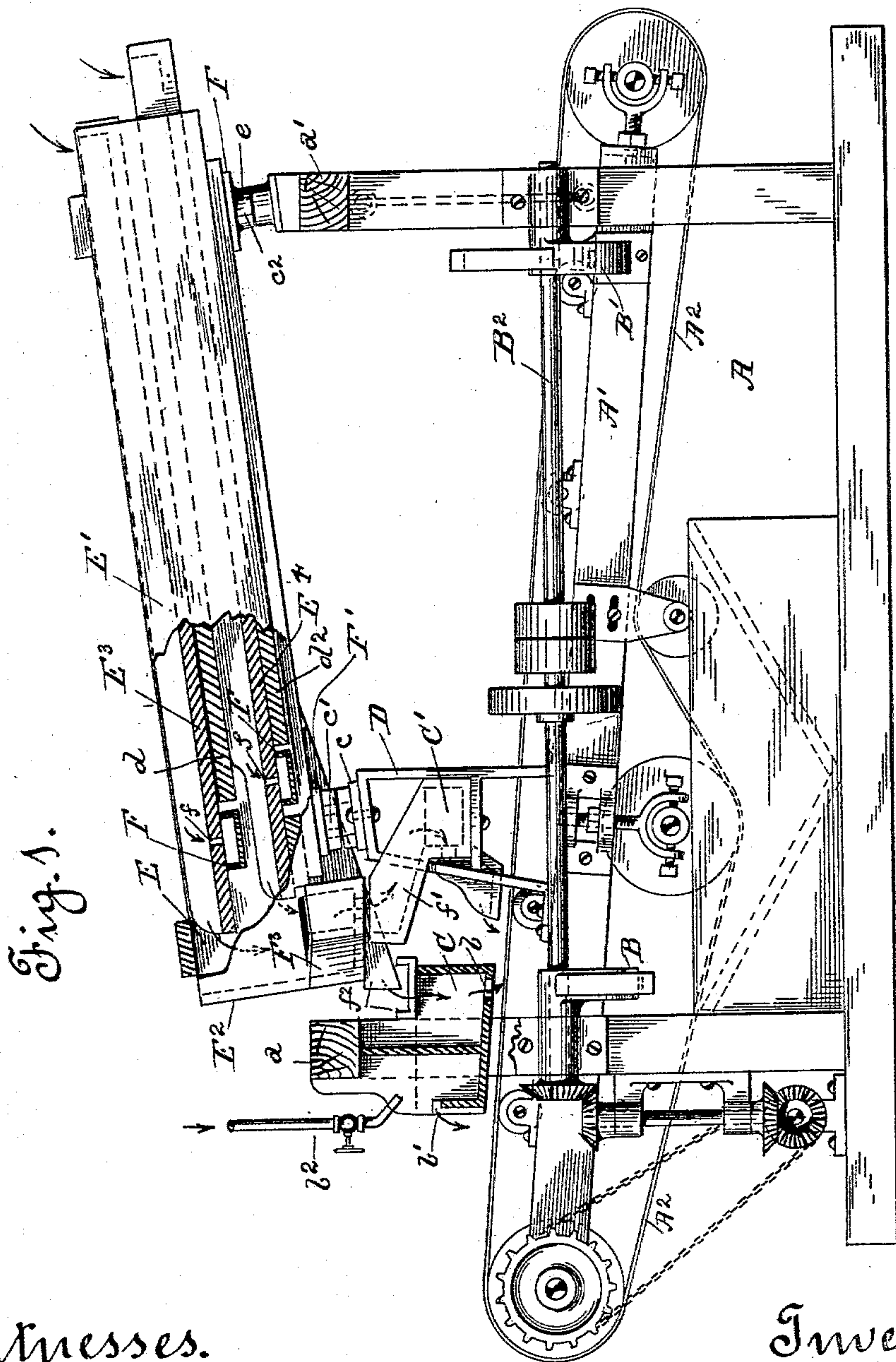
3 Sheets—Sheet 1.

L. R. TULLOCH.

FEED MECHANISM FOR ORE CONCENTRATORS.

No. 561,630.

Patented June 9, 1896.



Witnesses.

J. E. Monteverde

M. G. Loefer

Inventor.

Louis R. Tulloch

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att'y

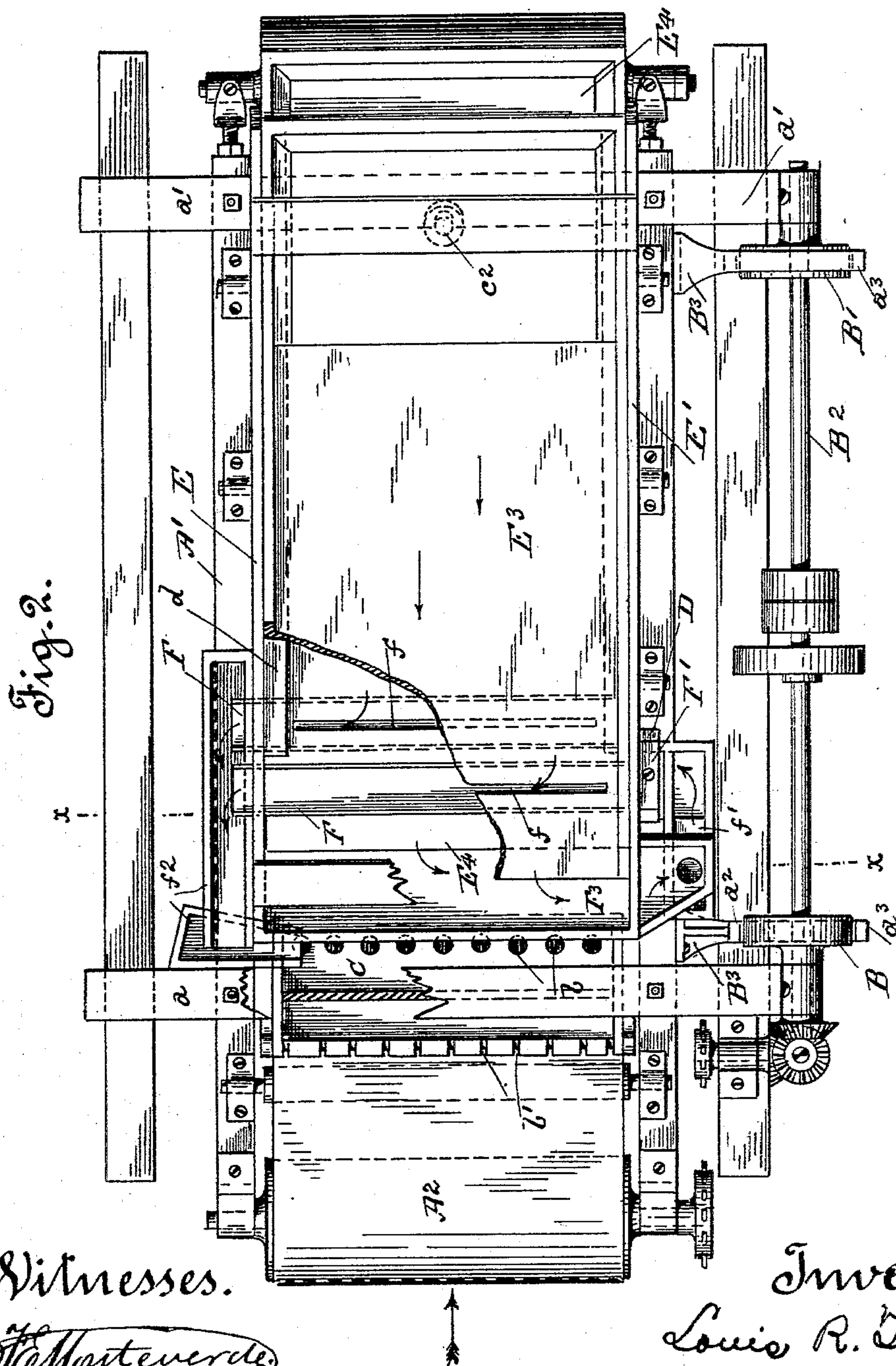
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Inventor.
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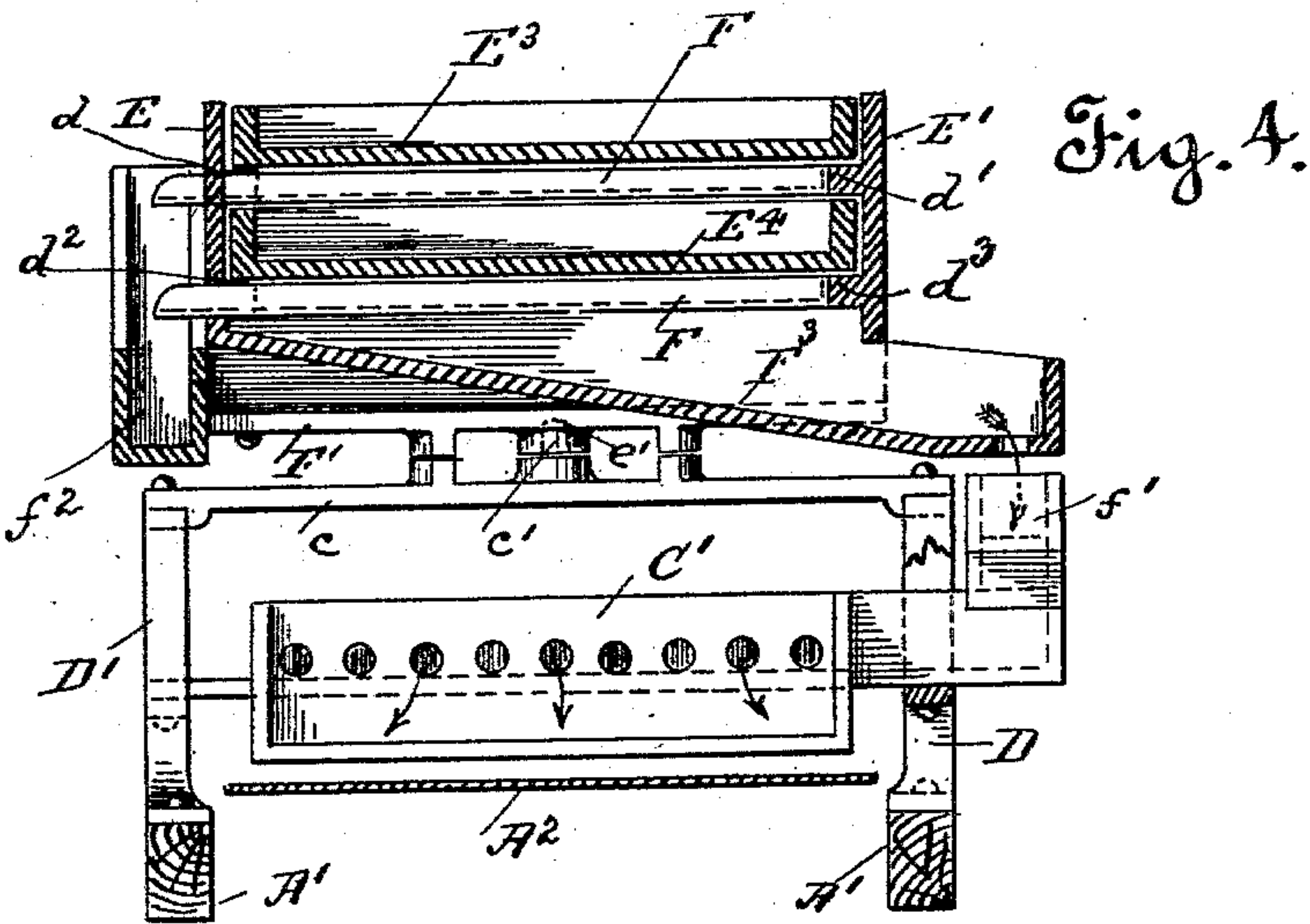
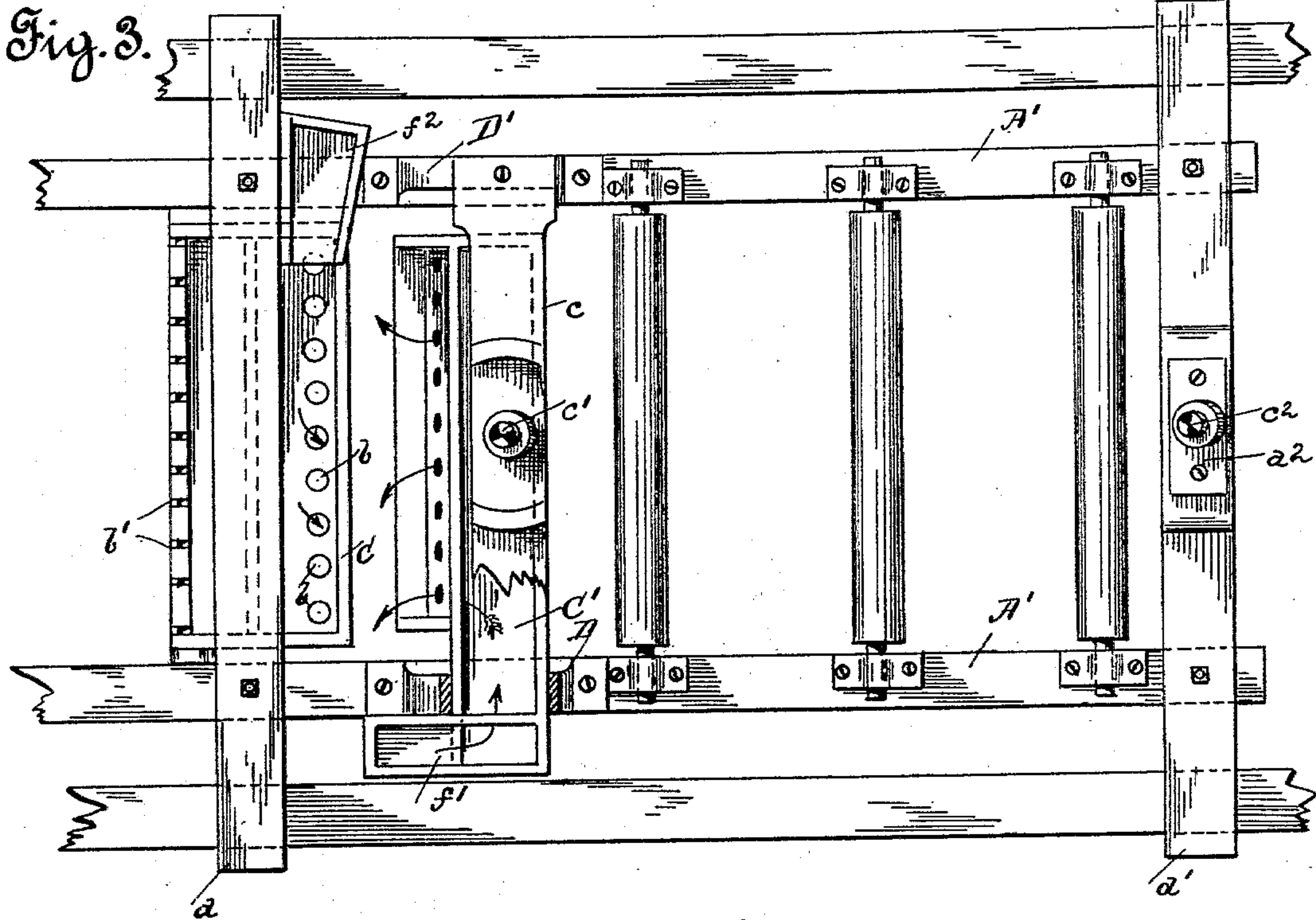
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UNITED STATES PATENT OFFICE.

LOUIS R. TULLOCH, OF ANGEL'S CAMP, CALIFORNIA.

FEED MECHANISM FOR ORE-CONCENTRATORS.

SPECIFICATION forming part of Letters Patent No. 561,630, dated June 9, 1896.

Application filed February 13, 1895. Serial No. 538,219. (No model.)

To all whom it may concern:

Be it known that I, LOUIS R. TULLOCH, a citizen of the United States, residing at Angel's Camp, in the county of Calaveras and State of California, have invented certain new and useful Improvements in Feed Mechanism for Ore-Concentrators; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My present invention relates to a certain new and useful feed mechanism for ore-concentrators, which is more especially designed for use in connection with that class of ore-concentrators wherein the concentration of the ore takes place upon an endless traveling belt, as will be hereinafter more fully set forth in the drawings, and described and pointed out in the specification.

The main feature of the invention consists in a shaking or vibrating ore-feed box which receives the ore from the stamp-mills in any suitable manner and conveys the same toward the concentrating-belt or the concentrator, said ore-feed box being so arranged as to deliver the ore upon the concentrating belt or table from two distinct pulp-receptacles, one located in advance of the other, one receptacle being designed to receive and distribute upon the concentrating belt or table ore that is nearly free of all base material, and the other such material as contains precious metal and base material combined.

The object of the invention is to separate the precious metal from the ore delivered to the feed-box, as much as possible, before the ore is delivered to the concentrating belt or table, so as to relieve the concentrator of undue work. By providing for a partial separation of the ore before delivering the same to the concentrator a better separation of the ore is secured and the liability of waste occurring in the tailing of the concentrator is reduced to a minimum.

In order to fully understand my invention, reference must be had to the accompanying drawings, wherein—

Figure 1 is a side view showing a concentrator with my improved ore-feed connected thereto, the ore-box being partly broken away.

Fig. 2 is a top plan view of the mechanism illustrated by Fig. 1. Fig. 3 is a view similar to Fig. 2 with the ore-feed box removed; and Fig. 4 is a cross-sectional end elevation on line $x x$, Fig. 2.

In the drawings the letter A is used to indicate the stationary supporting-frame. From the upper cross-pieces $a a'$ of said frame is suspended the movable concentrator-frame A' . Over this frame travels the concentrator-belt A^2 . A lateral shake or oscillatory motion is imparted to the movable frame in any suitable manner, preferably through the medium of the eccentric cams $B B'$, secured upon the shaft B^2 , which cams, during rotation of shaft B^2 , engage with the arms $a^2 a^3$ of brackets B^3 , which project from the movable or swinging frame and serve to impart a transverse oscillatory motion to the movable frame of the concentrator. These features are of the ordinary construction and form no part of my present invention.

Above the concentrating-belt A^2 , near the forward end, is located the pulp-receptacle C, which is secured to the cross-piece a , as shown. This pulp-receptacle is provided with a series of openings b , through which the pulp or ore makes its escape upon the upperface of the concentrating-belt. In front of this receptacle is located the water-tank, which tank is provided with a series of openings b' , through which the water makes its escape upon the concentrating-belt. The water is conveyed into this tank by means of the water-pipe b^2 . To the rear of the pulp-receptacle is located a second pulp or ore receptacle C' , which receptacle is held in place above the concentrating-belt, a distance below the first receptacle, by the brackets $D D'$, which brackets are secured to and project above the side pieces of the movable frame. These brackets are connected by the cross-piece c , from the center of which cross-piece upwardly projects the stud or pin c' . The brackets and cross-piece may be said to constitute the supporting-frame.

Above the frame of the concentrator is located the feed-box, which conveys the ore from the stamp-mill or battery to the pulp-receptacles. This feed-box consists of the side pieces $E E'$, end piece E^2 , and bottom E^3 . The bottom is a movable one and slides upon

the guide-strips d d' , secured to the inner face of the side pieces E E' . In the present drawings I have shown a second slidable bottom E^4 , which is located beneath the slide plate or bottom E^3 and is held in place by the guide-strips d^2 d^3 . This ore-feed box is mounted above the concentrator, so as to have an oscillatory motion imparted thereto. In order to accomplish this movement, I pivot the rear end of ore-box to the cross-piece a' of the fixed or stationary frame. This end of the ore-box oscillates upon the pin or stud c^2 , projecting upwardly from the plate a^2 , secured to the cross-piece a' , as shown, which pin fits through the opening e of the bottom plate F of the ore-box. To the bottom of the ore-box, near its forward end, is secured the cross-plate F' , which is provided with the central opening e' , through which the projecting stud or pin c' of the cross-piece c fits. Consequently, as the movable frame of the concentrator has a lateral oscillation imparted thereto, the forward end of ore-box will be likewise moved, the rear end working upon its pivotal point or stud c^2 , before described. The rear end of the ore-box is elevated somewhat, as shown, so as to give a gradual downward incline toward the forward end. As the ore is carried toward the forward end of the ore-box the lateral movement of the box causes a separation of the ore, the heavier or precious material finding its way toward the bottom of the box.

As the ore continues its travel toward the forward end of the ore-box the precious ore which has become separated from the mass during the shaking movement of the ore-box makes its escape through the openings or slots f , cut through the forward end of the movable bottom, into the receiving-box F , secured within the ore-box, near its forward end, so as to lie directly beneath the escape-openings of the bottom, while the balance of the material is discharged from the bottom into the receiving-box F^3 . The material is conveyed from this box to the pulp-receptacle C' by means of the runway f' . The material fed into this receptacle contains all the lighter and such other precious material as has not been separated by the shaking movement of the ore-box.

The ore delivered into the receiving-box F —of which I show two in the present drawings, one for each bottom—is conveyed to the pulp-receptacle C , located in advance of the receptacle C' , by means of the runway f^2 , which receives the ore from the receiving box or boxes F and delivers the same to the pulp-receptacle C . From this receptacle the ore makes its escape upon the concentrating-belt.

Owing to the shaking motion imparted to the ore-box it is believed that the ore fed into the receiving box or boxes F will be nearly pure and require but little concentration by the machine. By thus separating the ore as fed to the machine and delivering the separated ore to the concentrating-belt from dis-

ting pulp-receptacles I not only reduce the work ordinarily required of the concentrator, but at the same time reduce the liability of the precious material escaping from the concentrating-belt with what is known as the "tailings."

I provide the ore-box with a removable bottom, in order that the same may be removed, in case it is desired to clean the same or secure access to the receiving box or boxes F .

In the present drawings I have illustrated the pulp-receptacles as being connected to and supported by the movable concentrator-frame; but it is obvious that they may be suspended in any other suitable manner. Again, I have shown mechanism by which a lateral or side shake is imparted to the ore-feed box; but I do not wish to be understood as confining myself thereto or to such a movement of the ore-feed box, for any suitable mechanism may be employed for imparting a shaking motion to the ore-feed box.

I am aware that changes may be made in the arrangement of parts and details of construction herein shown and described without necessitating a departure from the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent of the United States, is—

1. The combination with an ore-concentrator, the pulp-receptacles for distributing the ore upon the surface of the concentrating belt or table, one receptacle being located in advance of the other, a shaking ore-feed box for conveying the ore to the concentrator, said ore-box having a perforated or slotted bottom through which the ore separated by the shaking movement of the ore-box makes its escape, a receiving-box into which the separated ore is discharged, a receiving-box for receiving the body of ore which flows from the bottom of the shaking ore-feed box, and runways for conveying the separated ore to the forward pulp-receptacle and the body of the ore to the second pulp-receptacle.

2. In an ore-concentrator, the combination with a movable concentrating-frame, having a belt thereon, of an ore-feed box, means for vibrating the box, comprising a connection between the same and frame, and a series of conductors leading from the sides of the feed-box, communicating therewith at different points and having their discharge ends arranged one in advance of the other adjacent to the belt.

3. In an ore-concentrator, the combination with the concentrating belt or table, of separate pulp-receptacles arranged thereabove so as to distribute the ore over the surface of the belt or table from two distinct points, a shaking ore-feed box arranged above the pulp-receptacles, said box provided with a removable slotted or perforated bottom and boxes for receiving separated ore as fed by the shaking ore-box, and devices for convey-

ing the separated ore from the receiving-boxes to the pulp-receptacles.

4. In an ore-concentrator, the combination with a movable concentrating-frame, and its
5 belt, of a shaking ore-feed box having discharge-openings formed in its base at different points, means for shaking the box, and separate conducting-troughs leading from the respective openings in the box to points
10 adjacent to the belt, and arranged with their discharge ends one in advance of the other.

5. In an ore-concentrator, the combination

with a concentrating-belt, of a shaking ore-feed box provided with a removable slotted or perforated bottom, and devices for convey- 15
ing the separated ore which passes through the slots to the belt and delivering the ore onto the belt at different points.

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

LOUIS R. TULLOCH.

Witnesses:

N. A. ACKER,
LEE D. CRAIG.