

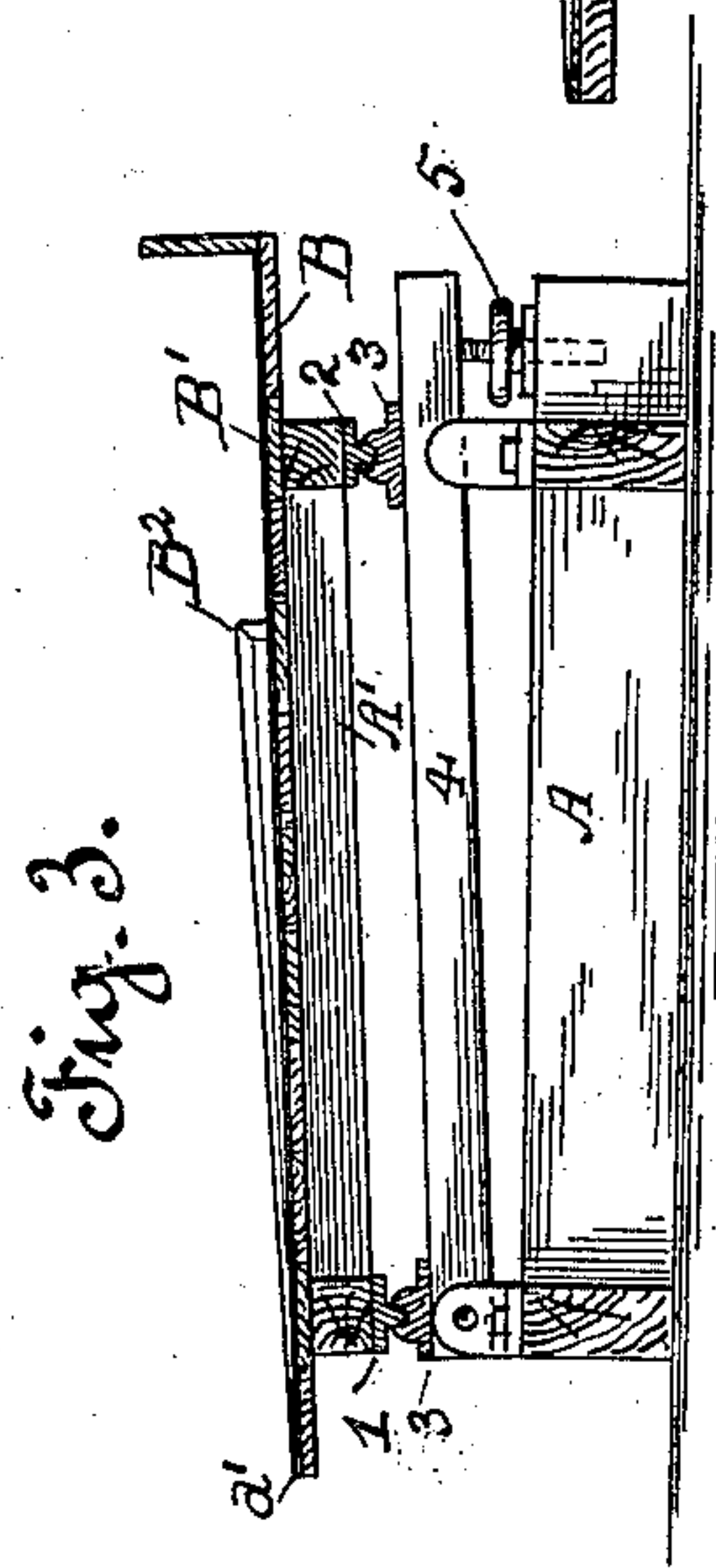
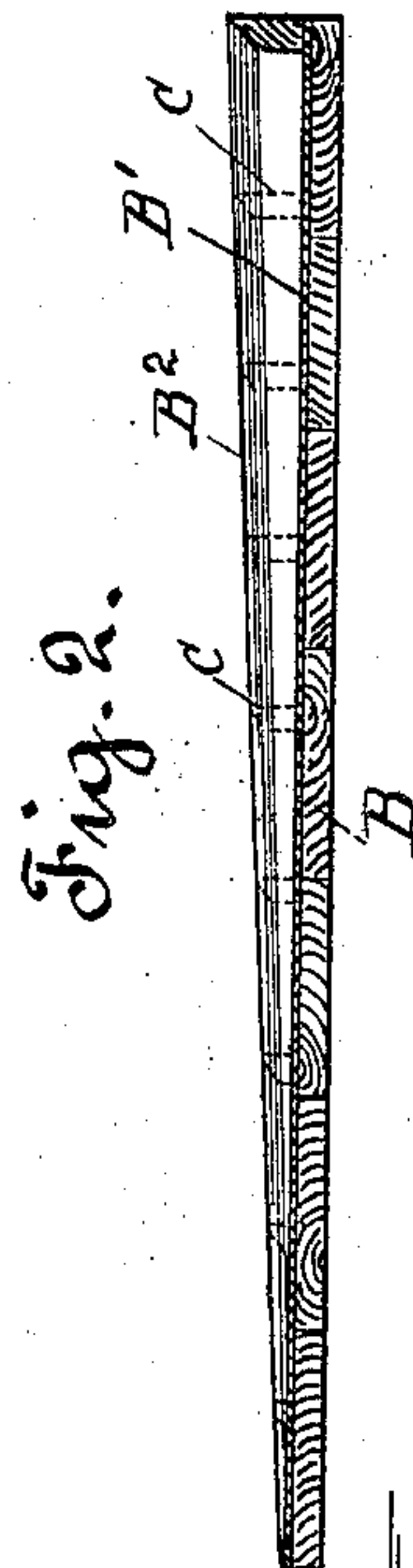
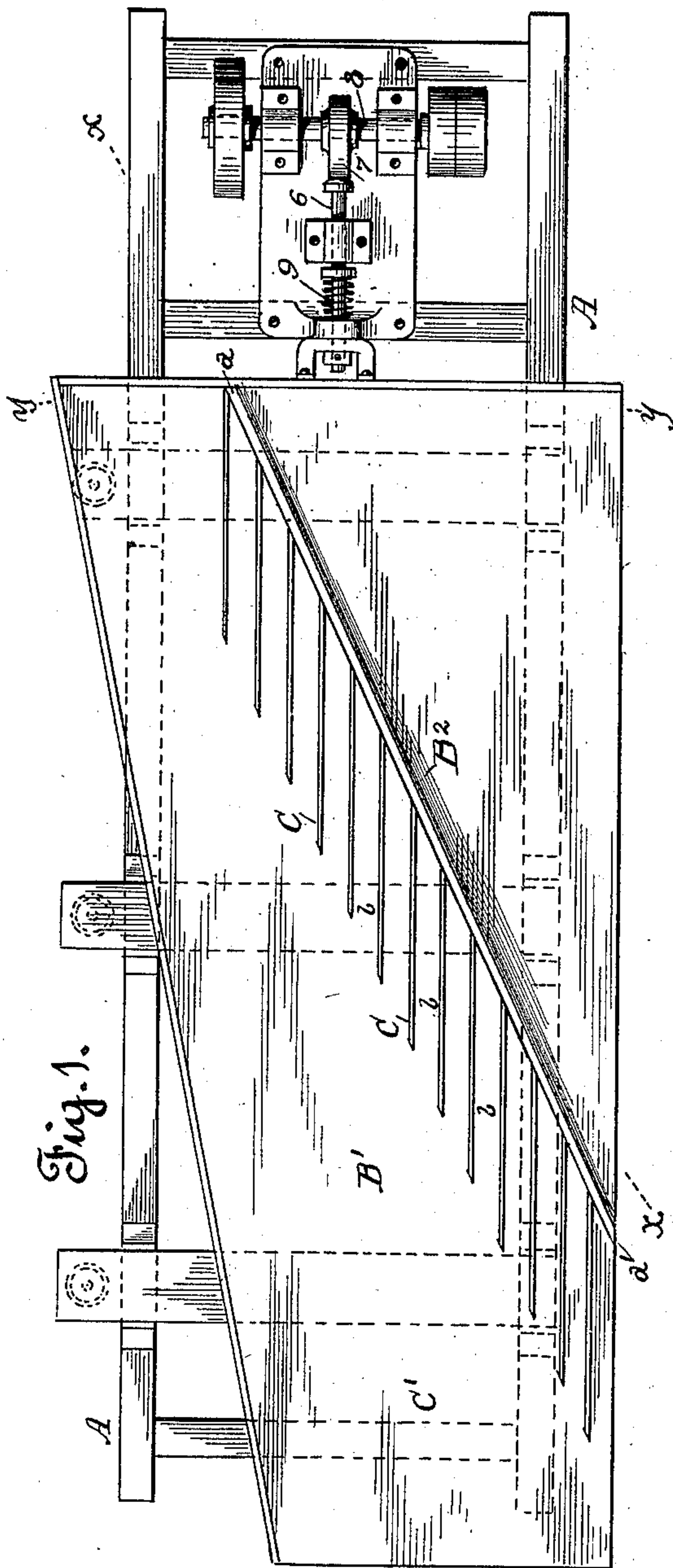
No. 638,324.

Patented Dec. 5, 1899.

W. G. DODD.  
CONCENTRATING TABLE.

(Application filed May 8, 1899.)

(No Model.)



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## CONCENTRATING-TABLE.

SPECIFICATION forming part of Letters Patent No. 638,324, dated December 5, 1899.

Application filed May 8, 1899. Serial No. 715,913. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIS G. DODD, a citizen of the United States, residing at the city and in the county of San Francisco and State of California, have invented certain new and useful Improvements in Concentrating-Tables; and I do hereby declare that the following is a full, clear, and exact description thereof.

10 The present invention relates to a certain new and useful concentrating-table for use more especially in connection with that class of ore-concentrators employing transversely-inclined tables having longitudinally-vibratory movement which tends to carry the material to be concentrated longitudinally forward toward the foot or tail of the table; and it consists in the arrangement of parts and details of construction, as will be hereinafter  
15 set forth in the drawings and described and pointed out in the specification. Ordinarily the table or concentrating-surface of this class of concentrators has its working face provided with or covered with a series of riffles extending longitudinally from the head toward the foot of the table, the theory being that as the material to be separated, together with the water, is fed onto the table at its upper edge the downward travel or flow thereof across  
25 the face of the table will be obstructed or arrested by the longitudinal riffles and the valuable or heavier particles or portions of the material being caught or settling in the riffles will, owing to the longitudinally-reciprocating motion imparted to the table, be diverted from vertical travel and caused to move longitudinally toward the foot of the said table and be discharged at such point into a receptacle provided for this purpose. In actual  
30 working, however, complete recovery of all valuable particles or portions of the material fed onto the table does not take place under the operation just described and much of the lighter particles of the valuable portions is not recovered, but instead carried off with the gangue or waste material flowing or carried over the table. This is due to the fact that the material coming in contact with the riffles is moved or carried forward by the action of the table, while the water, with which the material is mixed, not being subjected to

the action of the table, flows downward over the riffles at the head of the table with such violent action as to carry with it a large percent. of the valuable particles of the material into the waste-slucice and at the same time bearing that portion of the material carried forward in the riffles in such condition as to require additional water-supply to assist in settling and separating the valuable particles contained therein.

The object of the present invention is to so construct the concentrating-table as to permit of the material to be treated and the water with which it is mixed to be more evenly distributed over the working face of the table and to obtain full control of the material during the operation of effecting a separation of the valuable portions from the gangue, thereby providing against loss of the valuable particles or portions of the material, which have heretofore been carried or washed down by the current or flow of water passing over the working face of the table.

To comprehend the invention, reference must be had to the accompanying sheet of drawings, forming a part of this application, wherein—

Figure 1 is a top plan view of the table. Fig. 2 is a diagrammatic sectional view on line  $x x$ , Fig. 1; and Fig. 3 is a cross-sectional view in elevation on line  $y y$ , Fig. 1.

In the drawings the letter A is used to indicate any suitable style of frame for the concentrator, within which is mounted to freely swing the concentrating-table, which in the present case consists of a frame A', having a covering of narrow boards or strips B. Upon these boards or strips B is laid linoleum, oil-cloth, or other covering B', which constitutes the working face of the table. On this face or surface is secured an overflow-rifle B<sup>2</sup>, which extends diagonally from the head end  $a$  of the table toward its foot edge or side, terminating at the point  $a'$  or lower edge of the table a distance from its head end. This overflow-rifle or obstructing-rib B<sup>2</sup> gradually decreases in height from its upper end toward its lower end, where its upper face is approximately flush with the surface or working face of the table. Joined to this diagonal rifle or rib is a series of longitudinal riffles or



ribs C, each of which is located an equidistance apart and secured or attached to the working face of the table. These riffles or ribs extend longitudinally or lengthwise of the table toward its discharge end and preferably terminate a short distance from said foot or discharge end, so as to leave a plain or unriffled surface C' at such end. The riffles or ribs C form a series of pockets or collecting-runways *b*, within which the material carried downward or crosswise of the table is caught and its travel diverted from crosswise of the table to lengthwise thereof. Each longitudinal riffle or rib C in height corresponds with the height of the diagonal overflow-riffle or rib B<sup>2</sup> at their points of juncture. Hence the table may be said to be provided on its working face with a series of longitudinal ribs which gradually decrease in height from the upper end of the table toward its lower end. Inasmuch as the flow of the water and material to be treated is strongest at the upper end of the table, it follows that the obstruction offered to the downward travel of the material should be greatest at such portion of the table and less resistance offered at its lower portion for the reason that the current is less at such portion. If the longitudinal riffles be of uniform height, a heavier flow of water will be required to wash the material downward than where the riffles are of unequal or gradually-reduced height. As stated, if of equal height a heavier flow of water is required, resulting in the material being washed over the upper riffles and "banking," so to speak, in the lower riffles, hence impairing the efficiency of the machine. However, by reducing or decreasing the height of the longitudinal ribs or riffles proportionately to that of the diagonal overflow-riffle or rib the material is permitted to flow gradually downward or crosswise of the table, and the work of each runway *b* being proportionately to the others as the body of material passed thereover and the obstruction offered by each riffle or rib being likewise in proportion to the force of the impelling stream or current of water at such points reaction of the water within the runways and carrying away of the lighter valuable particles of the material treated is prevented. As a consequence of this arrangement while the heavier valuable particles or portions will be mainly caught or settled in the upper runways of the table the lighter particles carried over such obstructing-ribs will settle, owing to their specific gravity and reduced flow of the water, within the lower runways, and thus be recovered or separated from the waste material and being carried forward to the unriffled portion of the table will be subjected to the action of clear water flowing thereover, and thus eliminated from the gangue with which it is mixed.

The diagonal overflow-riffle B<sup>2</sup> being placed, as shown, in line with the natural flow or path

of the material confines the water with which the material is mixed and causes it to flow with the material, so as to wash or separate the base or worthless portion from that which is valuable, which base or worthless portion is carried over the diagonal riffle or rib, which decreases in height from the head toward the foot of the table for this purpose. This diagonal overflow-riffle or rib thus serves as an obstruction for confining the water at such end of the longitudinal riffles and preventing the same flowing too freely over such portion of the table and carrying the material containing valuable particles or portions therewith, although it permits the downflow of the water after being retarded for such time as to permit settling of the valuable particles. This riffle or rib thus acts as a restraining-wall. If it were not for this rib, all the material flowing at the head of the table would be washed away by the flow of the water, and if said rib or riffle extended straight, so as to form an end wall for the table, it would simply serve to cause the material to bank at such point and to throw the full current of water toward the foot of the table in order to wash or carry away the lighter valuable portions.

The concentrating-table is secured to the slides 1 2, which work in guides 3 of the adjustable frame 4, said frame being hinged at one side to the fixed frame A. By means of the adjusting-screw 5 the transverse inclination may be increased or decreased by raising or lowering the adjusting device. Below the table is secured the rod 6, which projects beyond the forward end of the table. This rod is thrown inward by means of the cam 7, mounted upon the drive-shaft 8, and is suddenly thrown outward by means of the spring 9, which surrounds the rod 6. Any suitable form of mechanism may be employed to impart the necessary motion to the concentrating-table, that described being made use of only on account of its simplicity.

In the operation of the machine the material to be treated is fed onto the table at its upper corner, near the head end thereof, the same being carried downward by the flow of water fed upon the table with the material to be treated. The reciprocating motion imparted to the table is such as to carry the material forward or toward the foot or tail of the table, while the inclination of the table is such as to tend to permit of the material to flow downward or crosswise of the table. These two forces acting upon the material forces the same to pass over the table in a diagonal path, as indicated by the diagonal overflow-riffle or rib B<sup>2</sup>. (Shown in the drawings.) As the material flows over the table the valuable particles or portions by reason of their specific gravity settle within the various runways *b*, formed by the longitudinal riffles or ribs C, and owing to the reciprocating motion of the table are gradually forced



toward the foot or tail end of the table, while the base or worthless material is carried over the diagonal riffle or rib B<sup>2</sup> and conveyed toward the lower end or bottom of the table and  
5 discharged therefrom.

With the described arrangement of the riffles perfect separation is effected, pure concentrates are obtained, and the loss of valuable, although light, material is practically  
10 eliminated, thereby making this class of ore-concentrators efficient and successful for the separation and recovery of fine or light gold from the ore and gangue.

I am aware that instead of securing independent riffles or ribs to the working face of the table a sheet or layer of rubber may be stamped or molded with said riffles or ribs thereon and said sheet or layer be used as the working face of the table. Hence my invention  
15 contemplates such form of table—*i. e.*, whether the working face of the table has independent riffles or ribs applied thereto or whether the same be formed integral with said working face.

I am aware that it is not novel to provide a concentrating-table having a series of riffles or ribs longitudinally arranged upon the working face thereof, and I do not wish to be understood as claiming this feature *per se*, for  
25 such is disclosed in Letters Patent No. 609,804, granted to Samuel I. Hallott August 30, 1898; but I am not aware that riffles or ribs so arranged have been made use of in combination with a rib or riffle run diagonally across the  
30 working face of the table and from which rib or riffle the longitudinally-arranged ribs or riffles extend.

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

1. In an ore-concentrator of the described class, the combination with the concentrating-table, of an overflow-riffle or rib arranged diagonally across the working face thereof, and  
45 of a series of parallel riffles or ribs joined to

said diagonal riffle or rib and extending longitudinally toward the foot or tail of the table.

2. In an ore-concentrator of the described character, the combination with the concentrating-table, having a movement whose tendency is to carry the material fed thereon toward the foot or tail of the table, of the overflow-riffle or rib arranged diagonally across the working face of the table and extending from its upper end to its lower side, a series  
50 of parallel riffles or ribs extending from the diagonal riffle or rib longitudinally toward the foot or tail of the table, and of a plain unriffled surface between the ends of the longitudinal riffles or ribs and tail of the table.  
60

3. In an ore-concentrator of the described character, the combination with the concentrating-table, of an overflow-riffle or rib arranged diagonally across the working face of the table and extending from its upper end to its lower side portion, said riffle or rib decreasing in height from its upper to its lower end, and of a series of parallel riffles or ribs extending from the diagonal riffle or rib longitudinally of the table or toward the tail or  
70 foot of the table, said ribs or riffles being of a height corresponding with the height of the diagonal riffle or rib at the juncture of said ribs therewith.

4. As a new article a concentrating-table for  
75 ore-concentrators the working face of which is provided with a diagonal overflow-riffle or rib extending across the face thereof from its upper end to its lower portion and with a series of parallel riffles or ribs extending from  
80 the diagonal riffle or rib longitudinally of the table or toward the foot or tail thereof.

In testimony whereof I hereunto affix my signature, in presence of two witnesses, this 21st day of April, 1899.

WILLIS G. DODD.

Witnesses:

WALTER F. VANE,  
N. A. ACKER.