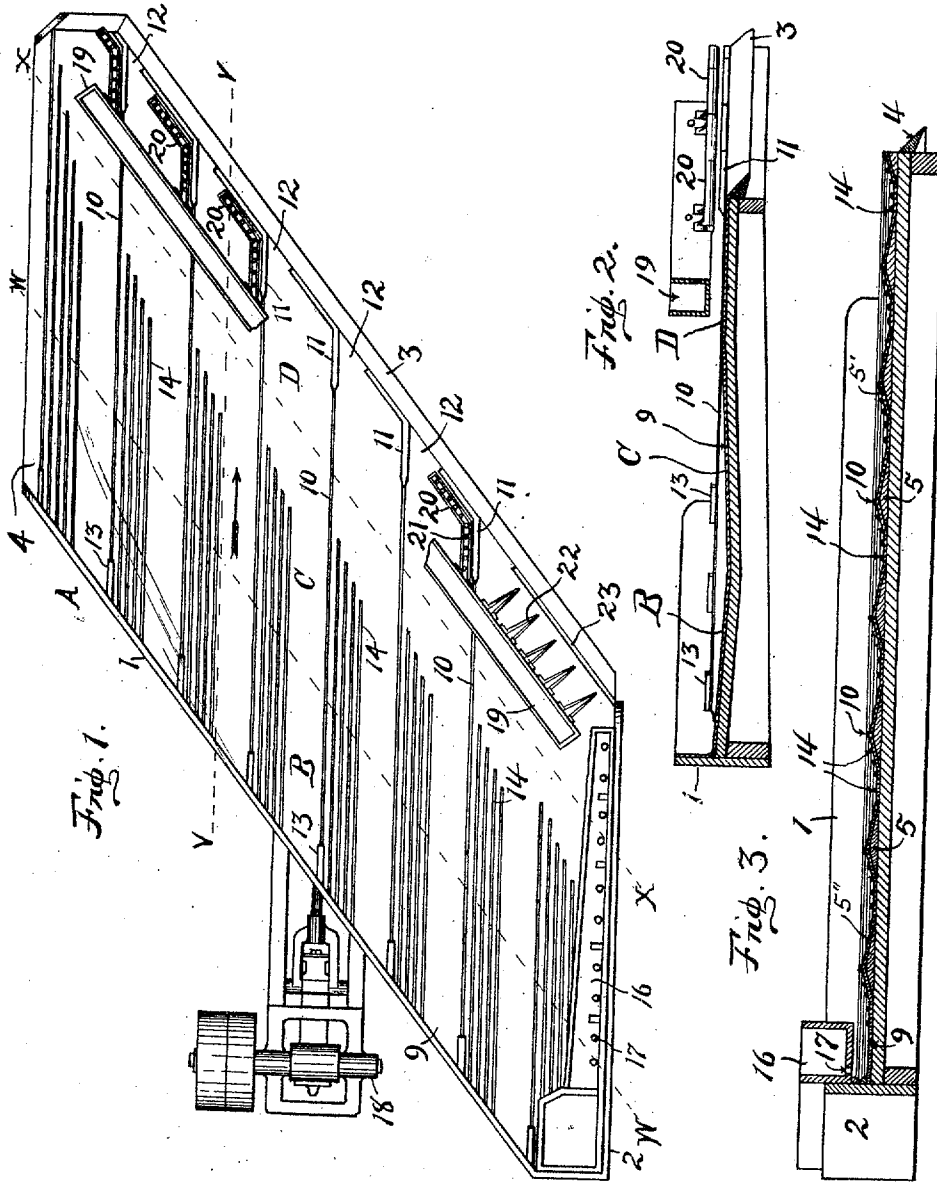


E. DEISTER.
ORE CONCENTRATOR.
APPLICATION FILED AUG. 9, 1909.

1,019,884.

Patented Mar. 12, 1912.

2 SHEETS—SHEET 1.



WITNESSES:
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ATTORNEY

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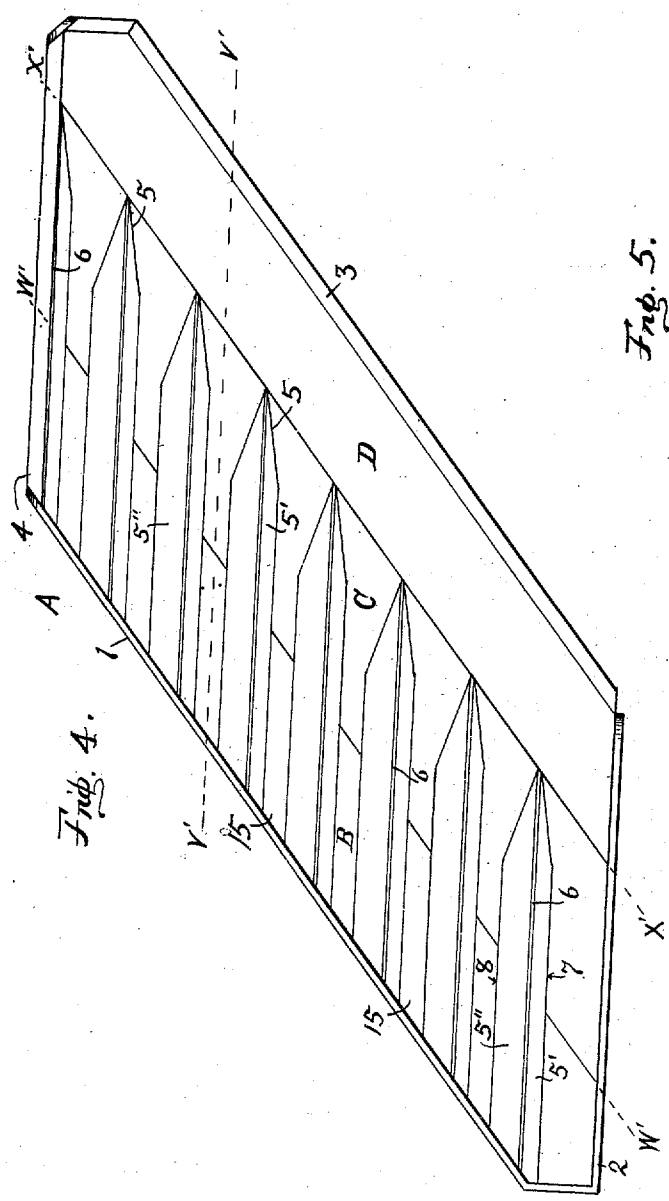


Fig. 5.

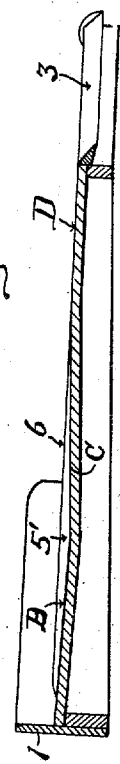
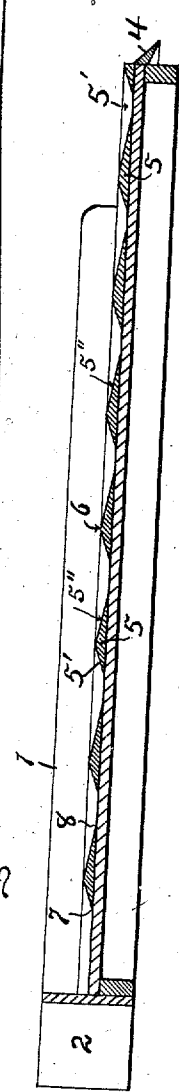


Fig. 6.



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UNITED STATES PATENT OFFICE.

EMIL DEISTER, OF FORT WAYNE, INDIANA, ASSIGNOR TO THE DEISTER CONCENTRATOR COMPANY, A CORPORATION OF INDIANA.

ORE-CONCENTRATOR.

1,019,884.

Specification of Letters Patent.

Patented Mar. 12, 1912.

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To all whom it may concern:

Be it known that I, EMIL DEISTER, a citizen of the United States of America, and resident of Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Ore-Concentrators, of which the following is a specification.

This invention relates to improvements in ore concentrators of the reciprocating table type, and the objects thereof are to so form a concentrator table that the solids of the ore pulp will readily come into contact with the surface proper of the table, and so that the solids will become easily progressed to a region on the table's surface adjacent the dressing area thereof and upon which region the lighter of the solids will become retarded in their progression toward the mineral discharge edge of the table.

Another object is to form the table so that the dressing water after flowing across the dressing area onto the region adjacent thereto will become effective thereon in washing back the superstratum of light solids and thereby prevent the same from reaching the dressing area.

These objects are accomplished by the construction illustrated in the accompanying drawings in which:

Figure 1, is a plan view of the table, the dressing-water supply box being partly cut away; Fig. 2, is a longitudinal section on the line V—V' of Fig. 1; Fig. 3, is a transverse section on the line W, of Fig. 1; Fig. 4, is a plan view of the table with the cover and superimposed riffles removed; Fig. 5, is a longitudinal section of Fig. 4, on the line V'—V' thereof; and Fig. 6, is a transverse section of Fig. 4, on the line W'—W' thereof.

Similar numerals and letters of reference indicate corresponding parts throughout the several views, and referring now to the same: A is a concentrator table of rhomboidal form and having a breast-board 1 along its rear end and a head-board 2 at its feed side, each of which projects above the general surface of the table. Along the front or mineral discharge end and at the tailings discharge side of the table are aprons 3 and 4 respectively over which the issues from the table are finally discharged.

Primarily the table is constructed so as to present three sections respectively B, C, and

D, which extend from the head-board to the tailings side and parallel with one another, and all have the same declivity in the direction in which they are parallel, the tailings side of the table being lower than the feed side when the table is in use. In other directions the sections differ in slant: For instance: Along lines parallel with the line V'—V' the section B slants downward from the breast-board toward its juncture with the section C; section C has an upward slant toward its juncture with the section D; and section D is approximately level. It will therefore be apparent that along lines at right angles to the line V'—V' the section C has a greater declivity toward the tailings side of the table than has the section D. Upon the table thus composed of sections is arranged and secured in place a series of plates 5 each of which extends from the rear end of the table, across the sections B and C and terminates at the inner edge of section D. The top or crest of each plate is approximately horizontal and lies in the same plane as the section B, or nearly so, and these crests 6 present slightly flattened surfaces which are flush with the section D at their junctures therewith respectively. In transverse section each plate slopes from its crest downwardly upon each side thereof to a feather edge as shown at 7 and 8. Thus the plates present slopes 5' and 5'' and form ridges crossing sections B and C; and they will be referred to by that name in the claims. Over the structure thus described is secured a sheet covering of rubber or linoleum 9 which is pressed down into conformity with the various surfaces presented by the plates 5 and sections B, C, and D, and this cover being substantially of uniform thickness presents a corresponding general surface or deck.

Superimposed upon the deck is a series of long riffles 10, each of which extends along the crest of a corresponding plate 5 and continues its course onto the section D. At the outer end of each long riffle is an enlarged extension 11 which projects upwardly from the surface of the table to a greater extent than the riffle proper and continues partway at an angle relative thereto along the outer edge of the section D, terminating at a point suitably distant from the next succeeding extension and leaving an unobstructed passageway 12 for the discharge of mineral.

Each long riffle has also at its inner end an upwardly projecting enlargement 13 which serves to break any detrimental rush of water that may occur across the rear end of the table.

Adjacent each long riffle upon the side thereof nearest the feed side of the table is placed a group of short riffles 14, and each group is arranged over a portion of the table's surface that corresponds with the slope 5' and the space 15 on the sections B and C that precedes the slope, each group being thus placed with respect to the corresponding plate 5. The riffles of each group are approximately of even thickness, or they may be slightly tapered as desired, and conform throughout their lengths with the surface of the deck, and each of said short riffles terminates on the section C at a point suitably distant from the section D.

A feed-box 16 having feed openings 17 therein is secured along the head-board 2 for supplying pulp to the table, and a driving mechanism 18 is arranged in connection with the table to reciprocate the same in the direction indicated by the arrow. A dressing water supply box 19 is arranged near the forward end of the table and a number of spouts 20 having perforations 21 therein lead from the box, each spout being formed with an angle to conform with the angle of the extension 11 adjacent thereto, and is supported slightly above the surface of the table at the side of the corresponding riffle extension nearest the tailings discharge side of the table. Another series of spouts 22 extend from the supply box and are adapted to discharge water upon the forward part of the section D adjacent the end of the feed-box, and a cleat 23 is secured along the edge of the table from the head-board to a point suitably distant from the adjacent extension 11.

In the operation of this invention, the table is mounted upon suitable supports (not shown) and adjusted in position with proper lateral inclination to cause pulp that passes from the feed-box onto the table to flow across to the tailings side thereof. Motion is applied to the table and pulp is supplied to the feed-box in the usual manner, and dressing water is discharged from the several spouts in suitable quantity along the forward edge of the section D. As the pulp flows across the table each group of short riffles becomes submerged by the water that is held by the corresponding long riffle and sloping surface that precedes it, but those surfaces of the table that slope downwardly toward the tailings side from the respective corresponding long riffles will not become likewise flooded, due to the lateral slant of the table, and consequently as the pulp passes over each long riffle it flows in a thin even film upon the succeeding sloping sur-

face of the table and in this manner the solids contained in the pulp are brought into close contact with the moving surface of the table. The movement of the table is of course differential and of a character that tends to progress solids resting upon its surface forwardly in the direction indicated by the arrow in Fig. 1. The downward slant of the section B toward the section C aids in the progression of solids thereon toward the latter section, and the riffles together with the slopes that respectively precede the long riffles afford cleavage for the heavier of the solids while the water that submerges the short riffles aids the transverse movement of the lighter solids or waste because of the buoyancy thereby afforded. The upward slant of the section C toward the section D has the effect more or less of resisting the progression of solids toward the latter section, especially the lighter particles which are more easily washed across the riffles, and hence the lighter of the solids move in a general course along the section C from the feed side of the table to the tailings side thereof, while the heavy particles that are held by the riffles and progressed forwardly by the motion are moved across the section D, and finally discharged through the passage-ways 12.

The dressing water that is applied along the outer margin of the section D flows across that section in a direction substantially at right angles to the riffles, due to the lateral inclination of the table, and in passing cleanses the mineral that lies in transit upon the surfaces between the long riffles and washes back the superstratum of light waste on the adjoining section. The comparatively greater downward slant of the section C in a direction at right angles to the riffles toward the tailings side causes the water that flows onto it from the section D to alter its angle of flow and increase its velocity somewhat. The greater slant of the section C causes the dressing water to flow more directly toward the section B, with greater velocity and in a thinner film than during its flow across the section D. This is very desirable as the quantity of transient gangue on the section C is much greater than the waste that passes onto the section D with the mineral, and a correspondingly greater force is required to displace it. It is also desirable to maintain upon the section D a considerable depth of dressing water and a gentle flow as this tends to prevent the formation of "floats" and washing away of fine particles of mineral. The cleat 23 and the extensions 11 prevent the premature discharge of dressing water from the forward edge of the table and tend to bank the water upon the surface of the section D so as to maintain

thereon a sufficient depth of water as will keep the moving mineral entirely submerged. As the dressing water falls from the several spouts 20 onto the surface of the table, it is prevented from interfering with mineral moving along the opposite side of the corresponding riffle because of the extensions 11, which in each instance is of sufficient height as will prevent the water from passing over the top thereof.

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

1. In an ore concentrating table having a transverse reciprocating movement the combination of three sections extending in parallel relation from the feed side to the tailings discharge side diagonally to the direction of reciprocation, and sloping toward the tailings discharge side, the first and second of said sections, counting from the end of the table opposite to the concentrates discharge, sloping also toward each other so as to form a trough by the junction between them, and the third of said sections, being the section adjacent to the concentrates discharge end, approximately level in the direction of reciprocation when in operating position.

2. In an ore concentrating table having a transverse reciprocating movement the combination of three sections extending in parallel relation from the feed side to the tailings discharge side diagonally to the direction of reciprocation and sloping toward the tailings discharge side, the first and second of said sections, counting from the end of the table opposite the concentrates discharge end, also sloping toward each other so as to form a trough by their junction extending from the feed side to the tailings discharge side, and the third section being approximately level in the direction of reciprocation when in operating position, and a series of ridges having sloping sides and extending from the end of the table opposite the concentrates discharge end across said first and second sections at suitable distances apart to the inner edge of the third section.

3. In an ore concentrating table having a reciprocating movement the combination of three sections extending in parallel relation from the feed side to the tailings discharge side diagonally to the direction of reciprocation and sloping alike toward the tailings discharge side, the first and second of said sections, counting from the end of the table opposite the concentrates discharge end, also sloping toward each other so as to form a trough by their junction extending from the feed side to the tailings discharge side, and the third of said sections being approximately level in the direction of reciprocation when in operating position, and a series of ridges having sloping sides and extending

from the end of the table opposite the concentrates discharge end across said first and second sections at suitable distances apart to the inner edge of the third of said three sections, being the section adjacent to the concentrates discharge, and a series of riffles of like number with said series of ridges, one riffle being located on the crest of each ridge and extending from the rear end to the forward end of the table.

4. In an ore concentrating table having a reciprocating movement and having a breastboard bordering the end of the table opposite the concentrates discharge end, the combination of three sections extending in parallel relation from the feed side to the tailings discharge side diagonally to the direction of reciprocation and sloping alike toward the tailings discharge side, the first and second of said sections, counting from the end of the table opposite the concentrates discharge end, also sloping toward each other so as to form a trough by their junction extending from the feed side to the tailings discharge side, and the third of said sections being approximately level in the direction of reciprocation when in operating position, and a series of ridges having sloping sides and extending from the breastboard across said first and second sections at suitable intervals to the inner edge of the third of said three sections, and a series of riffles of like number with said series of ridges, one riffle being placed on the crest of each ridge and extending across said third section to the concentrates end of the table, and having a raised portion extending a suitable distance from the breastboard to prevent too great flow of water along that part of the table adjacent the breastboard.

5. In an ore concentrating table having a reciprocating movement the combination of three sections extending in parallel relation from the feed side to the tailings discharge side diagonally to the direction of reciprocation and sloping toward the tailings discharge side, the first and second of said sections, counting from the end of the table opposite the concentrates discharge end, also sloping toward each other so as to form a trough by their junction extending from the feed side to the tailings discharge side, and the third section being approximately level in the direction of reciprocation when in operating position, and a series of ridges having sloping sides and extending from the end of the table opposite the concentrates discharge end across said first and second sections at suitable distances apart to the inner edge of the third of said three sections, and a series of riffles of like number with said series of ridges placed on the crests of said ridges—one on each, extending across said third section to the outer edge thereof and thence along the outer

edge of the table to a point suitably distant from the next similar riffle below it to leave a suitable opening for the discharge of concentrates, and having that portion thereof adjacent to the edge of the table and for a suitable distance back from said edge of suitably raised height to prevent overwash of the material being treated.

6. In an ore concentrating table having a reciprocating movement and having a breastboard bordering the end of the table opposite the concentrates discharge end, the combination of three sections extending in parallel relation from the feed side to the tailings discharge side of the table diagonally to the line of reciprocation and sloping toward the tailings discharge side, the first and second of said sections, counting from the end of the table opposite the concentrates discharge end, sloping also toward each other so as to form a trough by the junction between them, and the third of said sections, being the section adjacent to the concentrates discharge, approximately level in the direction of reciprocation when in operating position, and a series of ridges having sloping sides extending from the breastboard across said first and second sections at suitable distances apart to the inner edge of the said third section, and a series of riffles located on the crests of said ridges—one on each, extending across the

table from the rear end to the front thereof, and groups of shorter riffles located on the slopes of the said ridges facing toward the feed side of the table, the slopes facing toward the tailings discharge side being free from riffles, said shorter riffles beginning at the breastboard and terminating on the second or middle section aforesaid at suitable distance from the outer edge thereof.

7. In an ore concentrating table having a reciprocating movement the combination of a trough extending from the feed side to and sloping toward the tailings discharge side with a section having a plane surface coterminous with the forward edge of said trough and adjacent to the concentrates discharge and approximately level in the direction of reciprocation in the operating position of the table, and ridges having sloping sides extending from the end of the table opposite the concentrates discharge end across the trough to the inner edge of the plane section and having riffles upon their slopes which face toward the feed side, but no riffles on the slopes facing toward the tailings discharge side.

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

EMIL DEISTER.

Witnesses:

WM. H. BEUSMAN,
WALTER G. BURNS.