Aug. 31, 1937. G. W. GILBRETH 2,091,811

CONCENTRATING TABLE

Filed March 2, 1936 2 Sheets-Sheet 1

Fig. 1

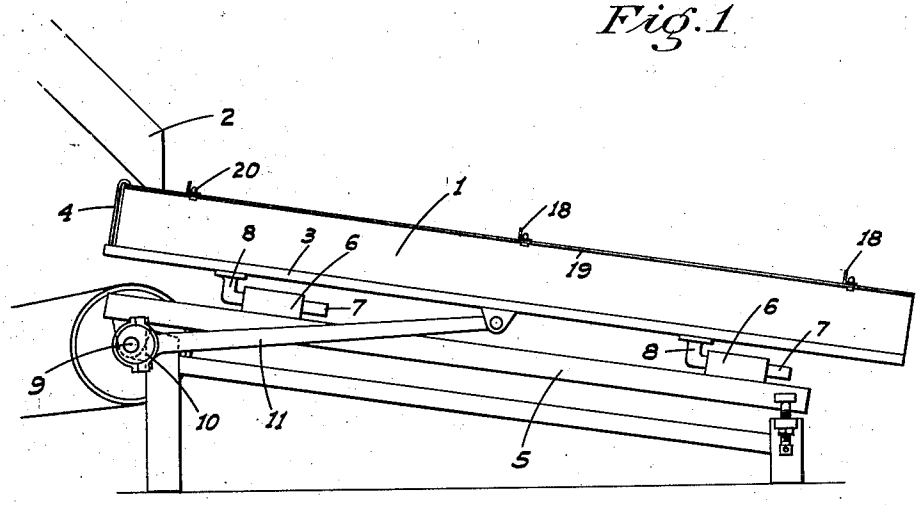
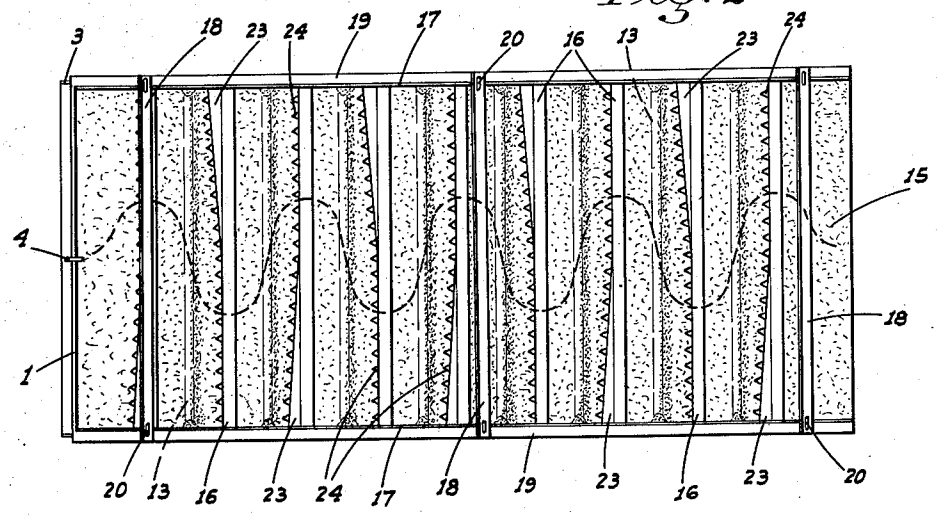


Fig. 2



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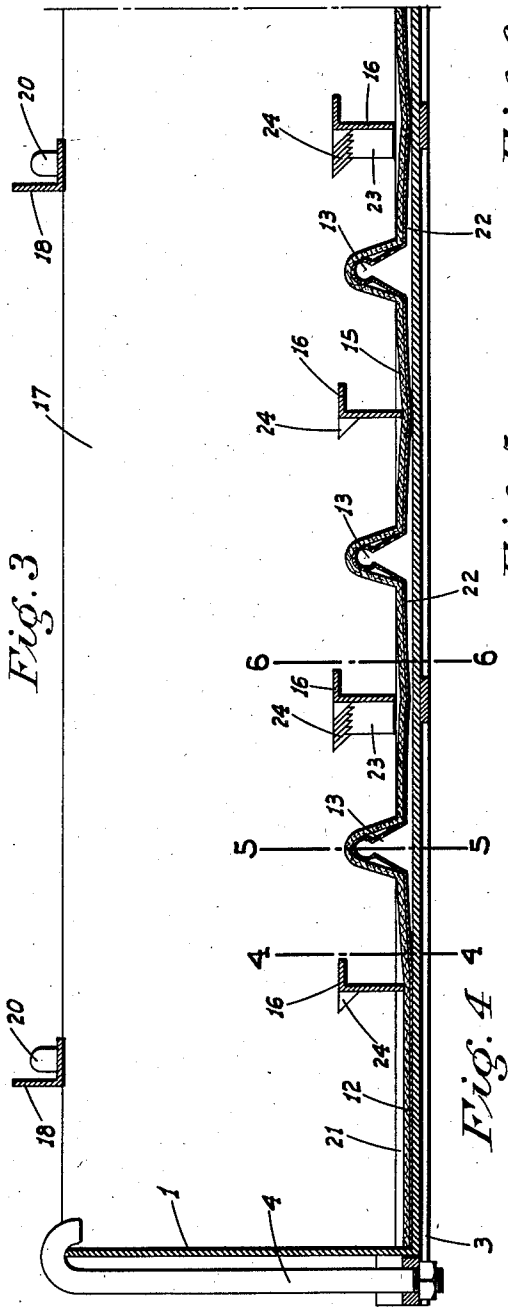


Fig. 3

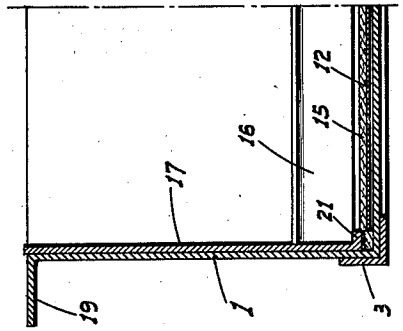


Fig. 6

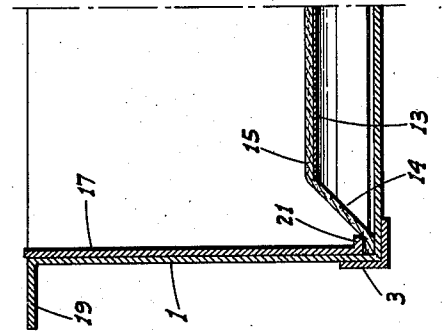


Fig. 5

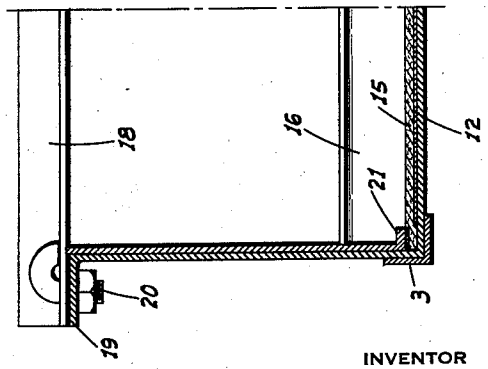


Fig. 4

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UNITED STATES PATENT OFFICE

2,091,811

CONCENTRATING TABLE

George W. Gilbreth, Los Angeles, Calif.

Application March 2, 1936, Serial No. 66,582

6 Claims. (Cl. 209—437)

This invention relates to concentrators of the shaker table type such as are used in placer mining operations. The principal object of my invention is to provide a concentrator table of this type provided with a values-catching surface and with a baffle and riffle arrangement such that an automatic suctional action is induced by the shaking of the table and the movement of the material along the same, which gives a very efficient concentrating action.

Another object is to construct and mount the portions of the table together so that it is a very easy matter to clean the same out for the recovery of the concentrates thereon.

A further object is to provide a means whereby the material will move in a zigzag path as it travels from end to end of the table, and if any of the particles of such materials are of relatively large size, they will be broken up as they travel. The concentrating action is thus greatly enhanced and the efficiency of the table is very high.

A further object of the invention is to produce a simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a side elevation of my improved concentrator assembly.

Fig. 2 is a top plan view of the concentrator table.

Fig. 3 is an enlarged fragmentary longitudinal section of the same.

Figs. 4, 5, and 6 are fragmentary cross sections of the table taken on the lines 4—4, 5—5, and 6—6 respectively of Figure 3.

Referring now more particularly to the characters of reference on the drawings, my improved concentrator table comprises a rectangular, relatively deep and long pan 1, open at one end, and into which the gravel or other material is fed adjacent its closed end from a chute 2 or the like. The pan is removably supported on the frame 3 of angle iron, etc., being held against undesired movement relative to the frame by a releasable hook bolt connection 4 or similar means.

The frame is supported on a downward slope toward one end so that the open end of the pan is at its lowest point from a fixed base which includes beams 5 under the sides of the frames 3 and mounted for vertical adjustment toward one end to alter their slope. Boxes 6 are secured on the beams in longitudinally spaced relation and slidable therein are rods 7 or the like, having upstanding extensions 8 at one end secured to the frame 3 as shown in Figure 1. The frame and pan are thus mounted for straight lengthwise movement in a plane at an angle to a horizontal plane.

Such movement is imparted to the frame in any suitable manner such as by a drive shaft 9, having eccentrics 10 thereon which are connected by arms 11 to the frame 3 intermediate its ends.

The main feature of my invention however, resides in the construction and arrangement of the material engaging and concentrating elements in the pan which will now be described. Removably disposed in the pan and resting on the bottom thereof is a false floor 12. This is of resilient sheet metal and extends from end to end of the pan, but is spaced from the sides somewhat. This floor is bent upwardly at intervals of its length to form what may be termed combination spring hinge and riffle elements 13 of substantially A-shaped form in section, and pinched-in intermediate their top and bottom. These riffles extend transversely of the floor for its full width, but at their ends are beveled off at an angle of approximately 45° for their full height as indicated at 14 in Figure 5.

The false floor including the riffle elements 13 are covered with a layer 15 of porous material such as carpeting or the like. This layer extends to the side edges of the pan as shown in Figures 4, 5, and 6, and it contacts with the floor throughout its area except where the riffles are pinched-in, where small spaces are formed between the riffles and carpeting as shown in Figure 3.

Superimposed on the carpet are transverse, evenly spaced baffles 16 spaced evenly between the riffles. These are preferably of inverted L-shaped form with their flanges facing toward the low end of the pan as shown in Figure 3. These baffles extend between and are rigidly secured to side plates 17 which removably fit in the pan in close relationship to the sides thereof; the baffles and side plates thus forming a single unit removable from the pan. The side plates are connected at intervals by crossbars 18 on top which are disposed slightly above and overhang flanges 19 which extend along the top edges of the pan. Suitable releasable clamping bolts 20 through the flanges and crossbars hold the

baffles and side plates against upward displacement.

The plates 17 are arranged so that when the bolts are tightened down, inturned flanges 21 along the lower edges of the plates firmly engage the carpet along its side edges and clamp the same against the bottom of the pan. Also the baffles are arranged so that the lower edges of the alternate ones are on a lower level than the remainder, so that they likewise engage the adjacent portion of the carpet and clamp the same and the false floor against the bottom of the pan at corresponding points. The lower edges of the other baffles, however, normally clear the carpet somewhat as plainly shown in Figures 3 and 6.

The false floor between adjacent baffles is normally curved upwardly or raised slightly in the longitudinal direction as shown at 22 in Figure 3. These raises are preferably of shallow arch-like form, with the riffle and hinge elements 13 at the highest point of the arch. The false bottom being of resilient metal, it will tend to hold its curved form, but can yield downwardly for the purpose which will be seen.

Secured on the back side of the baffles are deflectors 23 which are of wedge-shaped form in plan. These extend in converging relationship from the side plates 17 to the back side of the baffles and terminate adjacent the center of the length thereof; being arranged in opposed or staggered relation on alternate baffles as shown in Figure 2. Also projecting from the said back side of the baffles at the top and also from the corresponding portions of the deflectors are horizontally extending triangular shaped teeth or agitators 24 which face toward the high or feed-in end of the pan.

In operation, as the material to be concentrated is fed into the pan at its upper end, it tends to move toward the lower open end of the pan due to the slope of the latter. The longitudinal agitation or shake of the table causes such material to be intermittently thrown against the back side of the baffles. This action not only causes the teeth 24 to break up any large pieces of such material as they tend to move over the top of the baffles but the angularly disposed deflectors 23 cause the material striking the same to be shifted laterally somewhat. Since the deflectors are disposed in alternately staggered relation, the material travelling from one end to the other of the table follows a zigzag path as indicated by the dotted line in Figure 2. A very efficient values separating action effective over the full width and length of the table is thus obtained and any tendency for the material to pack on the table is avoided.

Also with the intermittent pounding of the mass of material on the carpet between the baffles had as a result of the table shaking and baffle-striking action, the resilient false floor is caused to have a vertical bellows-like movement along its different upwardly curved portions 22. This movement of the floor creates a suctional effect tending to draw air through the areas of the carpet across the open ends of the riffles 13 as well as along the same where the carpet is spaced from the riffles. As a result, the values in the material and striking the riffles as the material is being washed along the carpet, is drawn into and held in the pores of the carpet adjacent said riffles.

When it is desired to make a cleanup it is obviously an easy matter to remove the baffle units by releasing the bolts 20 and withdrawing the carpet with its precious content. It may here be noted that since the side edges of the false floor are spaced from the sides of the pan, said floor is not pinched or clamped by the plate flanges 21 so that said floor is free for the desired and necessary vertical movement under the clamped carpet.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

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

1. A concentrator table comprising a relatively long pan open at one end, means supporting the pan for longitudinal shaking movement and at a downward slope to its open end, means to feed material into the upper end of the pan, means to shake the pan whereby the material will tend to move toward the lower open end of the pan, a removable values collecting carpet covering the area of the bottom of the pan, means releasably clamping the side edges of the carpet against the bottom of the pan, transverse rigid baffles in the pan upstanding from and engaging the carpet at longitudinally spaced intervals, a resilient metal false floor under the carpet normally having a flat, arch like raise between adjacent baffles; the floor being bent upwardly at the peak of each raise to form hollow transverse riffles of substantially A-shaped form.

2. A structure as in claim 1, in which the ends of the riffles are cut away on an inward bevel to the top; the carpet covering the open beveled ends of the riffles and following substantially the exterior contour of the riffles lengthwise of the same.

3. A concentrator table comprising a relatively long pan open at one end, means supporting the pan for longitudinal shaking movement and at a downward slope to its open end, means to feed material into the upper end of the pan, means to shake the pan whereby the material will tend to move toward the lower open end of the pan, a removable values collecting carpet covering the area of the bottom of the pan, transverse rigid baffles upstanding from the carpet at longitudinally spaced intervals and extending from side to side of the pan, a resilient false floor under the carpet normally holding the same yieldably raised between the baffles, and means formed with said floor to cause a suctional action to be had through the carpet between the baffles with the shaking of the pan and the movement of the material in the pan induced by such shaking.

4. A concentrator table comprising a relatively long pan open at one end, means supporting the pan for longitudinal shaking movement and at a downward slope to its open end, means to feed material into the upper end of the pan, means to shake the pan whereby the material will tend to move toward the lower open end of the pan, a removable values collecting carpet covering the area of the bottom of the pan, and transverse upstanding baffles disposed in the pan at longitudinally spaced intervals and extending from side to side of the pan and to adjacent the carpet, riffles extending transversely of the pan under the carpet and holding the same raised at points

intermediate the baffles, said riffles being hollow and terminating short of the sides of the pan and being open at their ends, the carpet extending over and covering said open ends.

5. A concentrator table comprising a relatively long pan open at one end, means supporting the pan for longitudinal shaking movement and at a downward slope to its open end, means to feed material into the upper end of the pan, values collecting means in the pan, longitudinally spaced transverse baffles in the pan, said baffles being relatively short in height, means to shake the pan to cause the material to tend to move toward the lower end of the pan and so that some of such material will be thrown against the baffles, and spaced teeth projecting in the direction of the upper end of the pan from the adjacent face of the baffles whereby to tend to act on and split the material thrown against the baffles.

6. A concentrator table comprising a relatively long pan open at one end, means supporting the pan for longitudinal shaking movement and at a downward slope to its open end, means to feed material into the upper end of the pan, means to shake the pan whereby the material will tend to move toward the lower open end of the pan, a removable values collecting carpet covering the area of the bottom of the pan, transverse rigid baffles upstanding from the carpet at longitudinally spaced intervals and extending from side to side of the pan, a resilient false floor under the carpet normally holding the same yieldably raised between the baffles, and means formed with said floor to cause a suctional action to be had through the carpet between the baffles with the shaking of the pan and the movement of the material in the pan induced by such shaking; the lower edge of alternate baffles terminating clear of the carpet while the remaining baffles clamp the carpet against the false floor.

GEORGE W. GILBRETH.