June 26, 1956 R. E. CLINT 2,752,041

PORTABLE DRY CONCENTRATOR FOR ORES

Filed Dec. 23, 1954 2 Sheets-Sheet 1

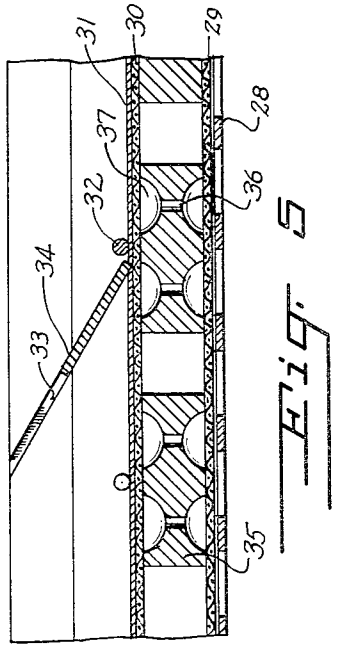


Fig. 5

Fig. 4

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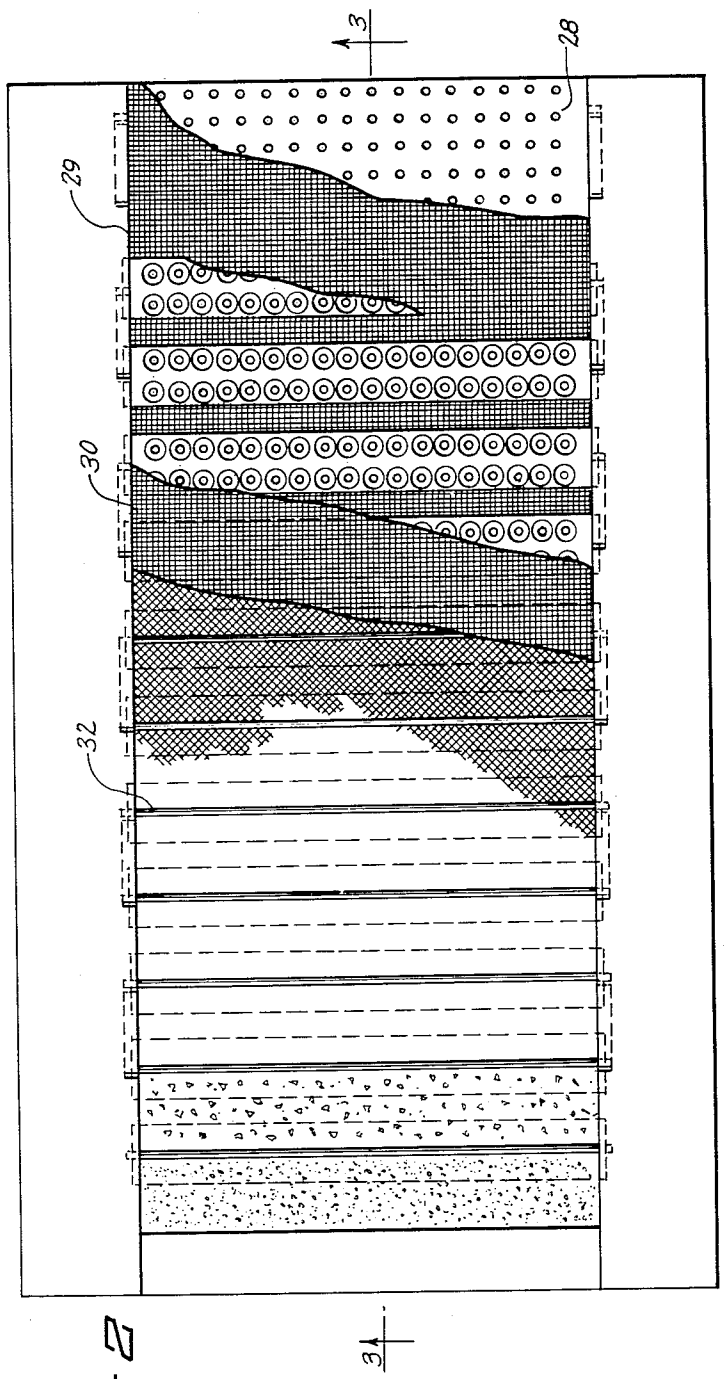


Fig. 2

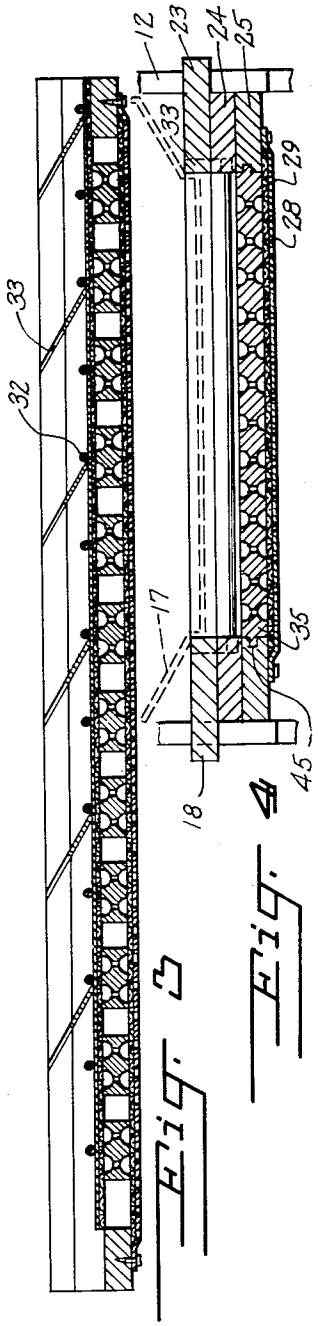


Fig. 3

Fig. 4

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PORTABLE DRY CONCENTRATOR FOR ORES

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2 Claims. (Cl. 209—475)

The present invention relates to dry concentrators for ores of the type which are portable and are used for separating flake and nugget gold, and other heavy metal particles from sand and gravel.

The primary object of the present invention is to provide a portable dry concentrator for ores which has relatively few parts, including a hand or foot operated bellows, and one having special means for concentrating the gold or other metal particles upon the top of the concentrating table.

Another object of the present invention is to provide a portable, light weight concentrating device for gold and other metals and one that has relatively few parts, easily assembled, and one which has special means within the table between the top surface and the bottom surface for creating eddies of air as it passes through, blowing the sand and gravel away from intimate contact with the gold or other metal.

A still further object of the invention is to provide a dry concentrator for ores having a hand or foot operated bellows for passing air through a concentrator table, the surfaces of which are disposed in spaced apart relation with the special means within the table for passing the air through the table from the bellows in such a way as to create eddies in the air, so as to better concentrate the gold particles and separate them from the sand and gravel.

These and other objects and advantages of the present invention will be fully apparent from the following description, when taken in connection with the annexed drawings, in which:

Figure 1 is a side view in elevation, partially in cross-section, of the present invention,

Figure 2 is a top plan view of the hollow concentrating table of the present invention, partially broken away to show the various layers and the construction of the table,

Figure 3 is a side view in cross-section of the table as seen in line 3—3 of Figure 2,

Figure 4 is an end view (in cross-section) of the table (taken on line 4—4 of Figure 1), and

Figure 5 is a detailed view of a cross-section, greatly enlarged, similar to the view shown in Figure 3.

Referring in greater detail to the drawing in which like numerals indicate like parts through the several views, the invention is seen to consist of an upstanding frame 10 having depending legs 11 and side members 12 which support the forwardly projecting top member 13 and the sloping member 14, the latter forming sides for a bin one panel of which is indicated by the reference numeral 15 in Figure 1, and a back panel of which is represented by the numeral 16 in that figure.

One side of the bin is shown in Figure 1, and is seen to be composed of sheet metal, preferably galvanized iron, and as indicated by the reference numeral 17.

The concentrating table of the present invention is formed with a pair of side members 18, each composed

of three strips of wood, as seen in end view in cross-section in Figure 4, and the side members 18 have their upper ends fastened to the frame 10 with their lower ends closed by a plate 19. Substantially at their mid length, the side members 18 are fastened together with a piece of scrap iron indicated by the reference numeral 20 in Figure 1 and assembled in place with a bolt 21 and a thumb nut 22.

Referring to Figure 4 in greater detail, the side members 18 are composed of the pieces 23, 24 and 25.

The pieces 23 do not extend all the way to the upstanding frame 10 but are terminated adjacent the forward edge of the sloping members 14 on either side of the bin.

The opening into the bin at the lower end thereof is closed by a swinging plate 26, as seen in Figure 1, supported at about its mid length upon a couple of posts 27, on each side of the plate, the latter of which is movable to a dotted line position indicated by the reference numeral 26' in Figure 1.

A concentrating table of the present invention, as seen in greater detail in Figures 2 to 5, is seen to be hollow with a bottom surface having a roller plate of galvanized sheet metal with ⅛" holes spaced ½" and center from each other. This plate is indicated by reference numeral 28 in each of the Figures 2 and 5. Covering this is a screen of fine mesh indicated by the reference numeral 29, this with the plate 28 constituting the bottom surface of the hollow concentrating table. Disposed in face-to-face spaced relation with respect to the bottom surface of the table is the top surface having a similar fine mesh screen indicated by the reference numeral 30 in each of Figures 2 and 5, over which is drawn a sheet of fabric indicated by the reference numeral 31 in a taut condition.

Riffle bars indicated by the reference numeral 32 extend from one side of the table to the other and have their ends anchored in the cases 24 in sockets provided therefor. The pieces 23 and 24 are provided with diagonally disposed slots 33 into each of which is slidable, removable riffle plate 34, for a certain purpose to be explained later.

An important feature of the present invention is shown in side and end cross-sectional views 3 to 5 in which bars 35 are provided spaced transversally with respect to the table and in side-to-side parallel spaced relation with respect to each other. Each of the bars 35 are formed with passages 36 disposed in a double row for the length of the bar 35 and an equally spaced distance from each other. Each of the passages 36 have an enlarged portion 37 adjacent each of the top and bottom faces of the associated bar 35.

The enlarged portion 37 of each of the passages 36 is shown to be hemispherical in shape and with the passage 36 constitutes a means for passing air under pressure from the bottom surface to the top surface of the concentrator table.

Referring to Figure 1, a bellows (38) is seen to be attached to the underside of the table between the legs 11 and the lower ends of the side members 18 (the bellows constituting an air pressure chamber).

The bellows 38 is formed with fabric side walls and with a solid end wall 39 which is provided, as shown in partial cross-section in Figure 1 with a flapper valve 40 for the admission of air to the bellows upon its expanding stroke. A spring 41 biases the bellows to closed position to force air through the concentrator table and a handle 42 is provided by means of which the bellows is again expanded against the tension of the spring 41.

The swinging plate 26 which normally closes the bin is biased to closed position by the spring 43.

A sponge rubber piece 44 extending between the legs 11 is intended to straddle the shoulder of the operator

as he carries the concentrator table of the present invention from one location to another, it being understood that the bellows 38 would then be in collapsed condition. In operation, sand and gravel containing gold flakes, or other particles, is introduced into the bin and the swinging plate 26 opened to permit some of it to fall upon the crossed top of the concentrator table. Air forced through the openings in the screen mesh and through the passages within the bars 35 and between the bars 35 acts to lift the sand and gravel, being lighter than the gold, upwardly and as it falls it travels down the surface of the table, leaving the gold or other heavy metal on the surface of the cloth and generally in lines adjacent to the rods 32. It has been observed with the present invention in use that the air passing through the passage in the bars 35 commingles with the air passing between the bar 35, eddies over the bars 35 at their edges permitting the sand and gravel to be thrown higher while the gold and other heavy metal particles are thrown only a short way above the table to which they return almost immediately while the sand and gravel is still being blown as each blast of air through the table diminishes. Referring again to the Figure 4, it will be seen that each of the bars 35 is provided at its end with a tenon 45 by means of which it is held in the piece 25.

In some cases of exceptionally fine particles of precious metal, the addition of the riffle plates 34 to the top of the table either singly or in combination, will assist in concentrating the particles and separating the particles from the sand and gravel.

While a single embodiment of the present invention has been here illustrated and described, it is believed that other embodiments may be made and practiced within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. In a dry concentrator for ores including an air pressure chamber open to the top and a hollow concentrating table having pervious-to-air top and bottom surfaces disposed in face-to-face spaced relation with respect to each other, said table being disposed in superimposed relation with respect to and closing the top of said chamber, the improvement consisting in providing means for creating eddies in the air passing through the table from said chamber, said means comprising a plurality of bars disposed transversely within said table in side-by-side spaced relation with respect to each other, said bars having their bottoms in abutting relation with the bottom surface of said table and their tops in abutting relation with the top surface of said table, each of said bars being formed with a passage for air extending from the bottom to the top for conducting air from the bottom surface of said table to the top surface, said passages being formed so that air passing therethrough and air passing between said bars eddies when commingled above said table top surface.

2. In a dry concentrator for ores including an air pressure chamber open to the top and a hollow concentrating table having pervious-to-air top and bottom surfaces disposed in face-to-face spaced relation with respect to each other, said table being disposed in superimposed relation with respect to and closing the top of said chamber, the improvement consisting in providing means for creating eddies in the air passing through the table from said chamber, said means comprising a plurality of bars disposed transversely within said table in side-by-side spaced relation with respect to each other, said bars having their bottom in abutting relation with the bottom surface of said table and their tops in abutting relation with the top surface of said table, each of said bars being formed with a passage for air extending from the bottom to the top for conducting air from the bottom surface of said table to the top surface, said passages each having an enlarged portion adjacent to the top and bottom face of the associated bar and a reduced portion connecting the enlarged portion so that air passing therethrough and air passing between said bars eddies when commingled above said table top surface.

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