May 12, 1925. 1,537,265

J. P. RUTH, JR

PNEUMATIC FLOTATION APPARATUS

Filed Feb. 21, 1920 2 Sheets-Sheet 1

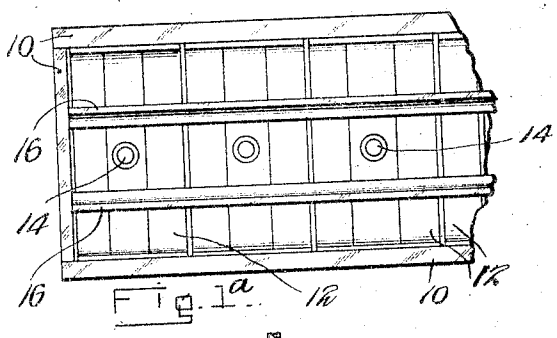


Fig. 1a

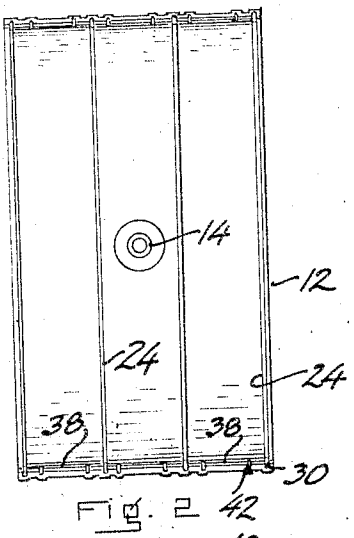


Fig. 2

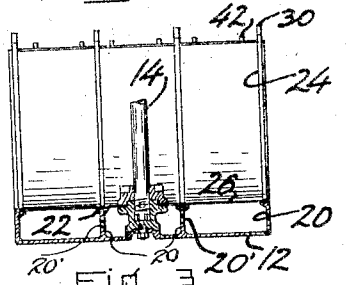


Fig. 3

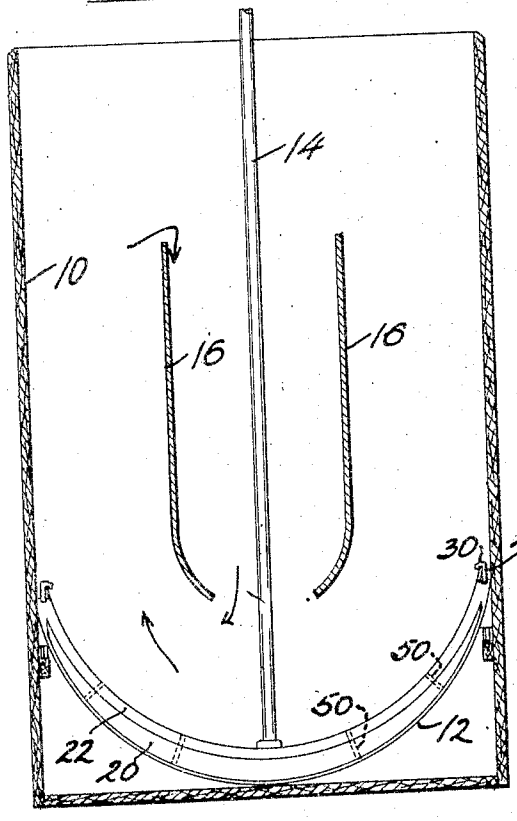


Fig. 1

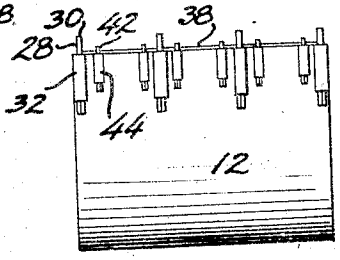


Fig. 4

INVENTOR.

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2 Sheets-Sheet 2

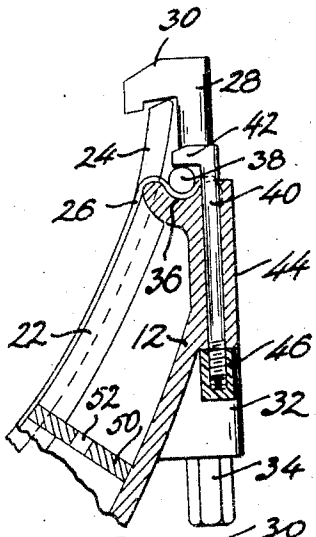


Fig. 5

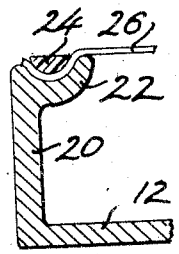


Fig. 6

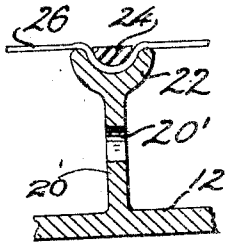


Fig. 7

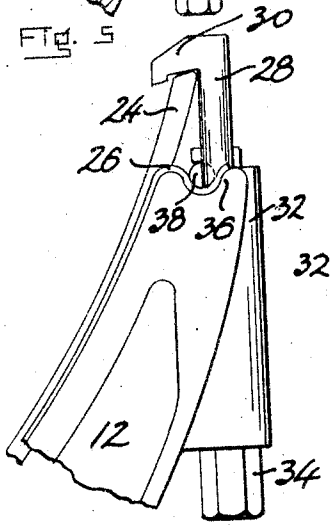


Fig. 8

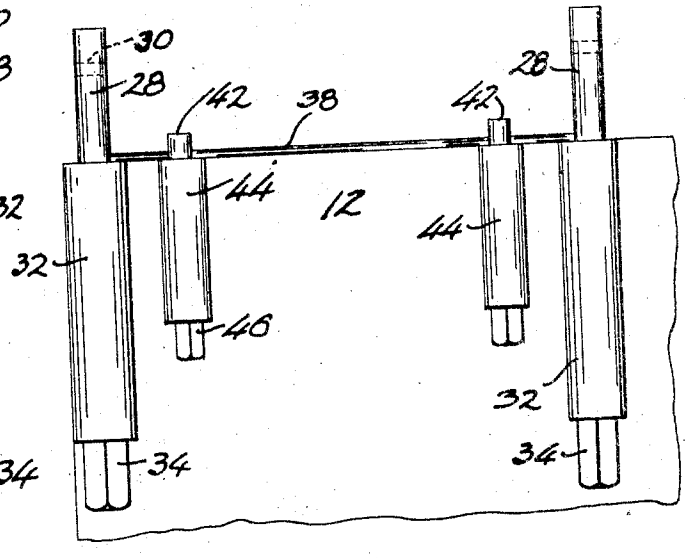


Fig. 9

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Patented May 12, 1925. 1,537,265

UNITED STATES PATENT OFFICE.

JOSEPH P. RUTH, JR., OF DENVER, COLORADO.

PNEUMATIC FLOTATION APPARATUS.

Application filed February 21, 1920. Serial No. 360,370.

To all whom it may concern:

Be it known that I, JOSEPH P. RUTH, JR., a citizen of the United States, residing at the city and county of Denver, State of Colorado, have invented certain new and useful Improvements in Pneumatic Flotation Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to practice the same.

The object of the invention is to provide a simple, and efficient means for fixing and stretching porous mediums across the bottoms of pneumatic flotation apparatus. It is also an object of the invention to control the pressure under different parts of said porous mediums according to the hydrostatic head at said different points.

In the drawings which form a part of this specification and in which like characters of reference indicate like parts—

Fig. 1 is a vertical cross section through flotation apparatus equipped with the invention.

Fig. 1ª is a plan view showing a plurality of sections in the tank.

Fig. 2 is a plan of one section of a bottom on which the porous medium is held according to this invention.

Fig. 3 is a transverse section along the longitudinal axis of Fig. 2 taken on line 3—3 of Fig. 2.

Fig. 4 is an end elevation of the section of Figs. 2 and 3 looking in the same direction as in Fig. 3.

Fig. 5 is detail sectional view showing the clamping devices for retaining the parts, and

Figs. 6 and 7 are similar views showing the manner of holding the porous medium.

Fig. 8 is a detail elevation similar to the showing of Fig. 5.

Fig. 9 is a detail elevation showing parts as seen in Fig. 4.

A tank 10 is shown which contains a hollow casting 12 to which the porous medium is secured. In practice a plurality of castings is used, these being arranged end to end along their longitudinal axis. Each casting is provided with a hollow shaft or tube 14 for conducting air or other gas to it. The tank contains thin partitions 16 which extend longitudinally thereof and cause a circulation of liquid in the direction indicated by the arrows.

Each casting 12 is provided with a plurality of transversely extending walls 20, the intermediate walls being apertured at 20′ for the passage of air from the center compartment. The top of each wall 20 is provided with a bead 22 which is provided with a groove to fit a corresponding transversely extending clamping bar 24 which clamps and retains the porous medium 26 in position. Vertically disposed pins 28 having upper overhanging hooks 30, which engage the tops or upper ends of the bars 24, are held in outstanding bosses 32 on the sides of the casting 12 by means of nuts 34 threaded on said pins. The nuts 34 also serve to tighten the hooks 30 against the ends of bars 24 to clamp them in fixed position. The upper edges of the side walls of the castings 12 are provided with beads 36 grooved to receive short rods 38 disposed between the bars 24 and pins 28 and adapted to clamp the side edges of the porous medium 26 to the castings. Smaller pins 40 have hooks or heads 42 which overhang the rods 38 to engage and hold the latter in position, said pins 40 being held in bosses 44 on the castings by means of adjusting or tensioning nuts 46.

In applying the porous medium 26, which is preferably some suitable fabric, such as canvas, the ends thereof are first clamped to the end walls 20 and beads 22 thereof by means of the respective bars 24 and hooks 30. Then the sides are clamped to the casting by means of rods 38 and heads 42. During these steps the fabric 26 is stretched as tight as possible. Then the intermediate bars 24 are clamped into position, thus forcing the fabric down into the grooves of the beads and further stretching it so that it presents a smooth and properly tensioned porous bottom through which the air is to be projected.

In order to decrease the air pressure slightly in the upper portions of the castings to compensate for the difference in hydrostatic head immediately above said portions, a plurality of partitions 50 is provided, these having apertures therein of such size as to retard the flow of air sufficiently to produce the proper decrease in pressure. In this manner uniform passage of air is had over the entire bottom.

I claim:

1. In pneumatic flotation apparatus, a hollow member curved about its longitudi-

nal axis, upstanding transverse walls, and bars for clamping a porous medium to the curved upper edges of said walls.

2. In pneumatic flotation apparatus, a hollow member curved about its longitudinal axis, upstanding transverse walls on said member, bars for clamping a porous medium to the curved upper edges of said walls, and means for clamping the ends of said bars for retaining them in position on the upper curved faces of said walls.

3. In pneumatic flotation apparatus, a hollow member curved about its longitudinal axis, upstanding curved walls on said member having grooves in their upper edges, a porous medium held in said grooves, bars engaging said medium and depressing the same to hold it in the grooves, and clamping members engaging the ends of the bars to clamp them in their curved positions in said grooves.

4. In pneumatic flotation apparatus, a hollow member having upstanding walls whose upper edges are provided with grooves, there being end walls, side walls, and intermediate walls, bars to bind a porous medium into all of said grooves and stretch said medium across said member, and means to engage said bars to retain the same in clamping relation.

5. In pneumatic flotation apparatus, a hollow member having upstanding walls whose upper edges are provided with grooves, bars to bind a porous medium in said grooves, and devices having overhanging hooked portions to engage said bars and clamp the same in binding position.

6. In pneumatic flotation apparatus, a hollow member to receive air under pressure, said member being curved about a longitudinal axis, and longitudinally disposed partitions provided with apertures to divide said member into a plurality of longitudinally extending compartments, and means to supply air to the lowermost of said compartments, whereby said apertured partitions serve to reduce the pressure in the upper compartments to vary with the hydrostatic head immediately above.

In testimony whereof I have affixed my signature.

JOSEPH P. RUTH, JR.