

May 13, 1952

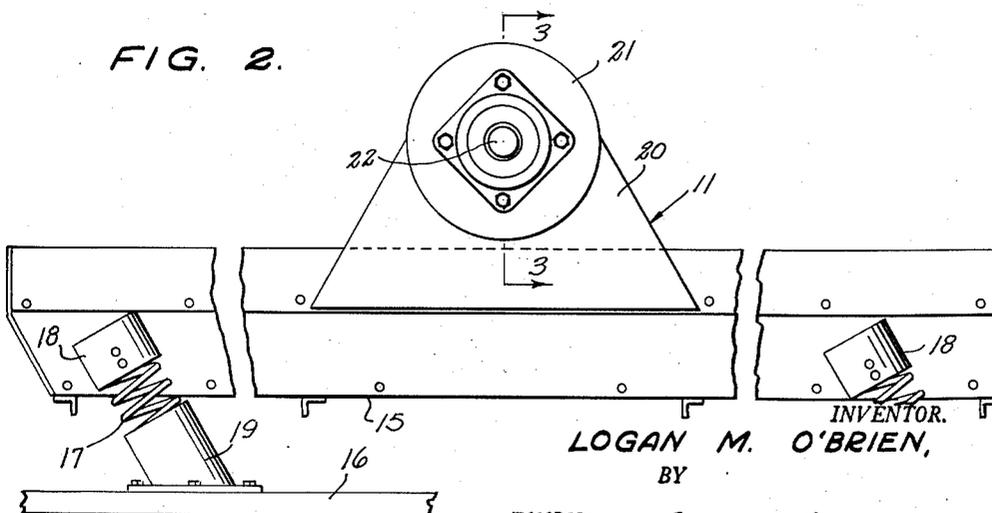
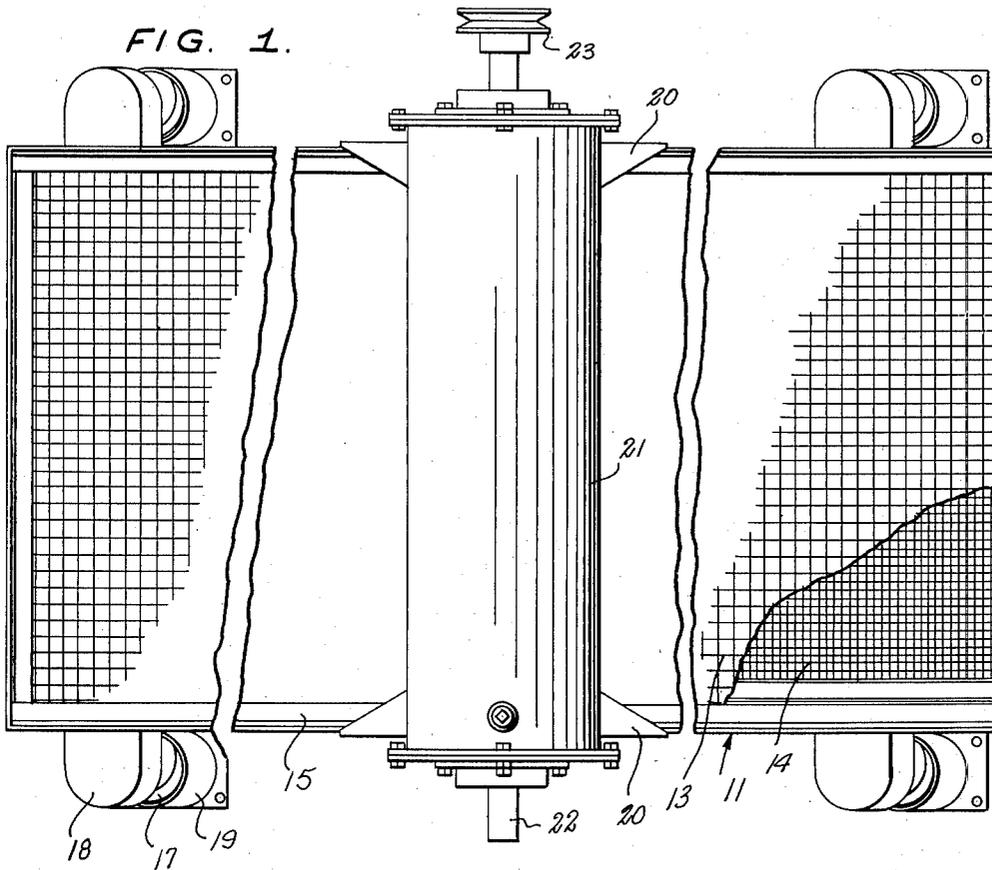
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2,596,281

OSCILLATOR HYDRAULIC HEAD

Filed June 3, 1949

2 SHEETS--SHEET 1



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2 SHEETS—SHEET 2

FIG. 3.

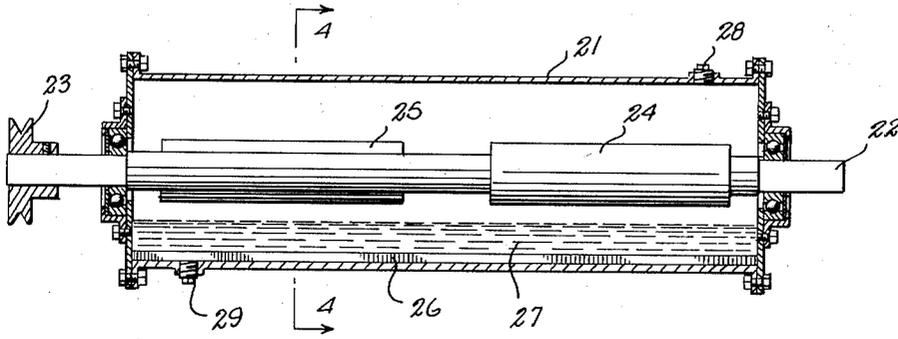


FIG. 4.

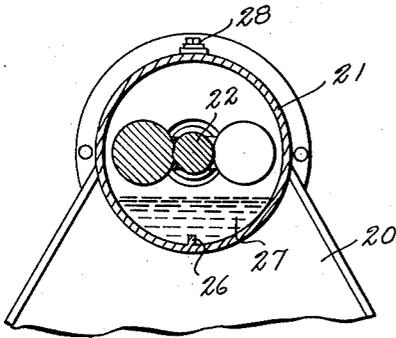


FIG. 5.

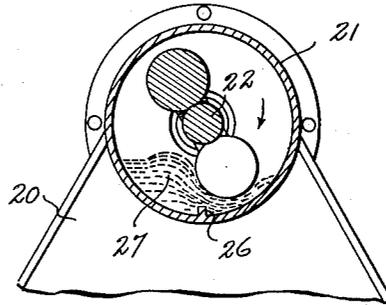
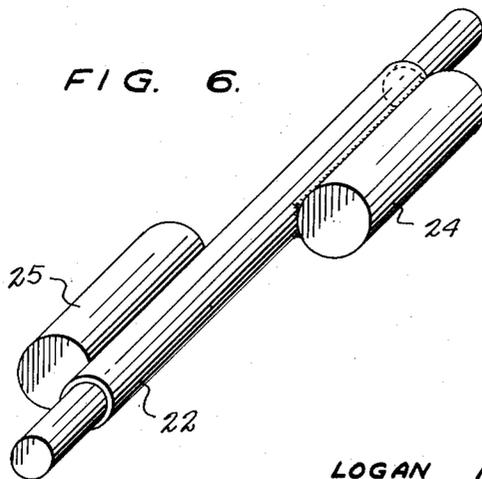


FIG. 6.



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# UNITED STATES PATENT OFFICE

2,596,281

## OSCILLATOR HYDRAULIC HEAD

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Application June 3, 1949, Serial No. 97,017

3 Claims. (Cl. 74-87)

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This invention relates to agitating devices, and more particularly to a screen-agitating mechanism for use in separating materials.

A main object of the invention is to provide a novel and improved oscillatory screen mechanism, which is simple in construction, compact in size, and involves only a few parts.

A further object of the invention is to provide an improved screen-vibrating mechanism which is inexpensive to manufacture, rugged in construction, and which provides a very efficient means for separating screened material, such as ore, crushed minerals, and similar comminuted material.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a fragmentary top plan view of a vibratory screen device constructed in accordance with the present invention;

Figure 2 is a fragmentary side elevational view of the vibratory screen device of Figure 1;

Figure 3 is a cross-sectional detail view taken on line 3-3 of Figure 2;

Figure 4 is a cross-sectional detail view taken on line 4-4 of Figure 3;

Figure 5 is a view similar to Figure 4, but showing the rotor of the vibrating mechanism in a position different from that shown in Figure 4;

Figure 6 is a perspective detail view of the rotor employed in the machine illustrated in Figures 1 to 5.

Referring to the drawings, the vibratory screen mechanism is shown generally at 11. Said mechanism comprises a rectangular screen unit having an upper coarse screen 13 and a lower fine screen 14 secured in a rectangular trough 15. The trough 15 is resiliently supported on a stationary supporting surface, shown at 16, by means of respective coiled springs 17 adjacent the corners of the trough, the respective ends of the springs being secured in inclined cups 18 secured to the trough 15 and in inclined cups 19 normally axially aligned with the respective cups 18, secured to the supporting surface 16, as shown in Figure 2. The axes of the springs 17 are inclined, and are parallel, whereby the trough 15 may be readily placed in oscillation and whereby the pan may oscillate simultaneously in a longitudinal, lateral and vertical direction.

Secured to the intermediate portions of the side walls of the trough 15 are upstanding triangular brackets 20-20 and secured to said

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brackets is a transverse cylinder 21. Journalled in the end walls of the cylinder 21 and extending axially therethrough is a shaft 22 having a pulley 23 fixed to one end thereof. Pulley 23 is coupled by a flexible belt or other suitable coupling means to a driving motor, not shown.

Welded or otherwise suitably rigidly secured to shaft 22 are the longitudinally-extending cylindrical bar members 24 and 25, said members being located on opposite sides of the shaft and adjacent opposite ends thereof, as shown in Figure 3. The bottom of cylinder 21 is formed with an internal upstanding longitudinal rib 26 which the cylindrical members 24 and 25 just clear as the shaft 22 is rotated. The cylinder 21 contains a quantity of liquid 27. Each time one of the cylindrical bar elements 24 or 25 rotates through the lower portion of the cylinder, it engages the liquid, and, due to the restriction to free flow imposed by the rib 26, as well as the frictional resistance imposed by the liquid on the rotating element, an unbalanced reactive thrust is developed on the shaft 22 which is transmitted to the trough 15 through the brackets 20-20. The cylinder 21 experiences alternating endwise pulsations due to the surging back and forth of the liquid in response to the alternate engagement of the elements 24 and 25 therewith. At the same time, pulsations longitudinally of trough 15 are developed due to the oscillation of the liquid 27 around the axis of shaft 22, as well as the longitudinal weight unbalance of the shaft. The net result is to cause the trough to oscillate longitudinally, vertically and laterally with respect to the fixed support 16.

The amplitude of the oscillations may be regulated by varying the amount of liquid contained in the cylinder 21. To facilitate filling or emptying said cylinder, a top filler plug 28 and a bottom drain plug 29 are provided thereon.

While a specific embodiment of an oscillatory screen mechanism has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. A vibrating mechanism for separators of the screen type including a cylinder; a shaft of integral formation arranged coaxially of and within the cylinder and journalled at opposite ends in the opposite ends of the cylinder; a quantity of liquid within the cylinder; and a pair of elongated

gated bar elements spaced longitudinally of the shaft in longitudinally contacting, parallel relation therewith, said elements being disposed diametrically opposite one another upon the shaft and being secured to the shaft rigidly throughout their lengths, said elements alternately passing through said liquid in a common direction to produce pressures exerted transversely of the cylinder tending to shift the cylinder transversely of its longitudinal axis.

2. A vibrating mechanism for separators of the screen type including a cylinder; a shaft of integral formation arranged coaxially of and within the cylinder and journaled at opposite ends in the opposite ends of the cylinder; a quantity of liquid within the cylinder; and a pair of elongated bar elements spaced longitudinally of the shaft in longitudinally contacting, parallel relation therewith, said elements being disposed diametrically opposite one another upon the shaft and being secured to the shaft rigidly throughout their lengths, said elements alternately passing through said liquid in a common direction to produce pressures exerted transversely of the cylinder tending to shift the cylinder transversely of its longitudinal axis, there being an open space of appreciable length located medially of the cylinder between the elements and adapted for shifting of said liquid in a mass longitudinally of the cylinder responsive to passage of the elements therethrough.

3. A vibrating mechanism for separators of the screen type including a cylinder; a shaft of integral formation arranged coaxially of and within the cylinder and journaled at opposite ends in the opposite ends of the cylinder; a quantity of liquid within the cylinder; an internal radial rib formed on the side wall of the cylinder and extending continuously from end to end of the cylinder in parallelism with the shaft; and a pair of elongated, cylindrical bar elements ar-

ranged tangentially to and spaced longitudinally of the shaft in longitudinally contacting, parallel relation therewith, said elements being disposed diametrically opposite one another upon the shaft and being secured to the shaft rigidly throughout their lengths, the elements alternately passing through said liquid in a common direction to produce pressures exerted transversely of the cylinder tending to shift the cylinder transversely of its longitudinal axis and being so proportioned as to diameter as to barely clear said rib on passage of the elements past the rib, the rib constituting means for impeding free flow of liquid set in motion transversely of the cylinder on passage of the elements therethrough, the cylinder having an open space of appreciable length located medially thereof between the elements and adapted for shifting of said liquid in a mass longitudinally of the cylinder responsive to passage of the elements therethrough.

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