

H. FOUST.

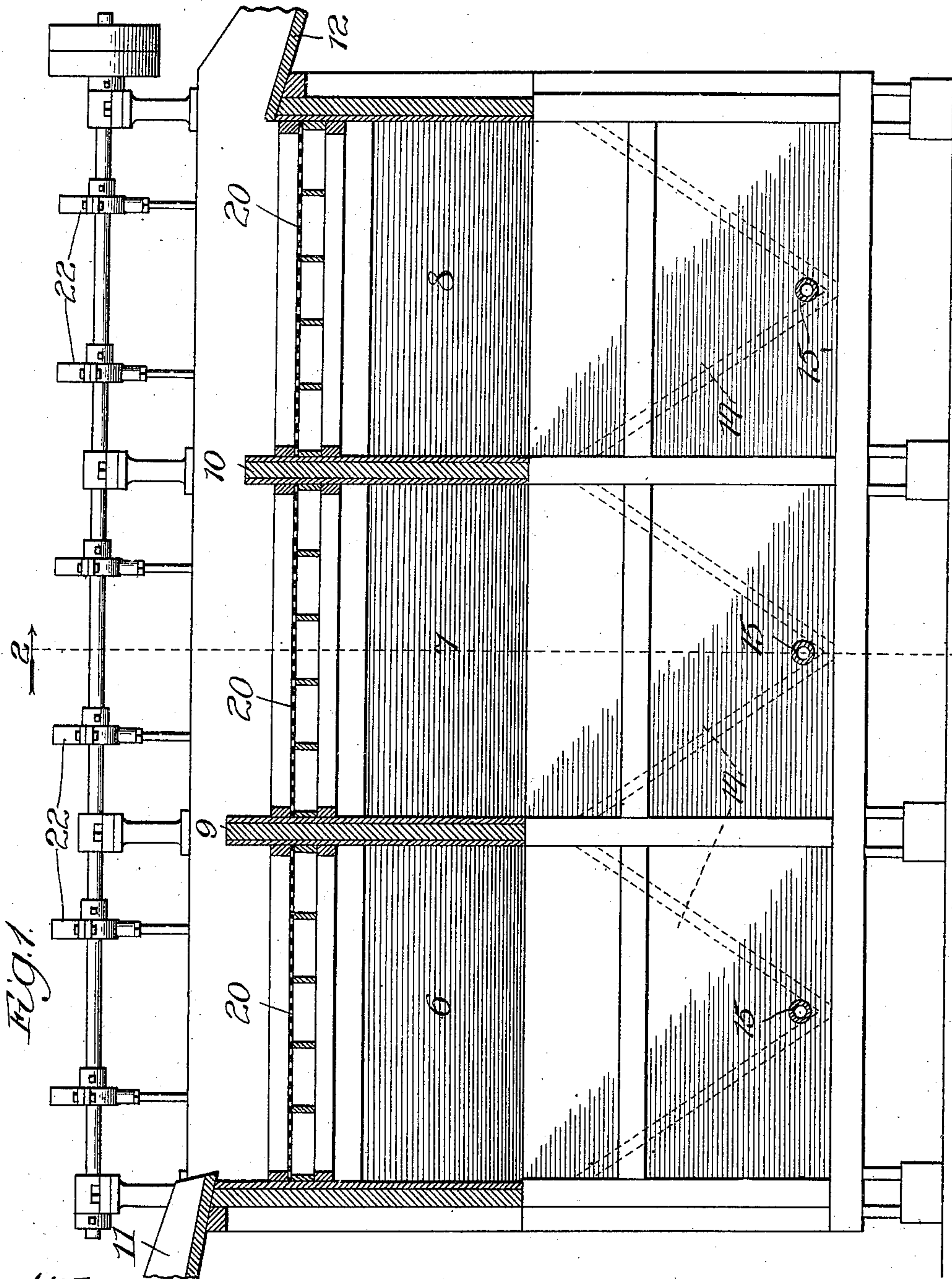
ORE JIG.

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983,616.

Patented Feb. 7, 1911.

2 SHEETS—SHEET 1.



Witnesses:
E. C. Gaylord,
G. F. Chase.

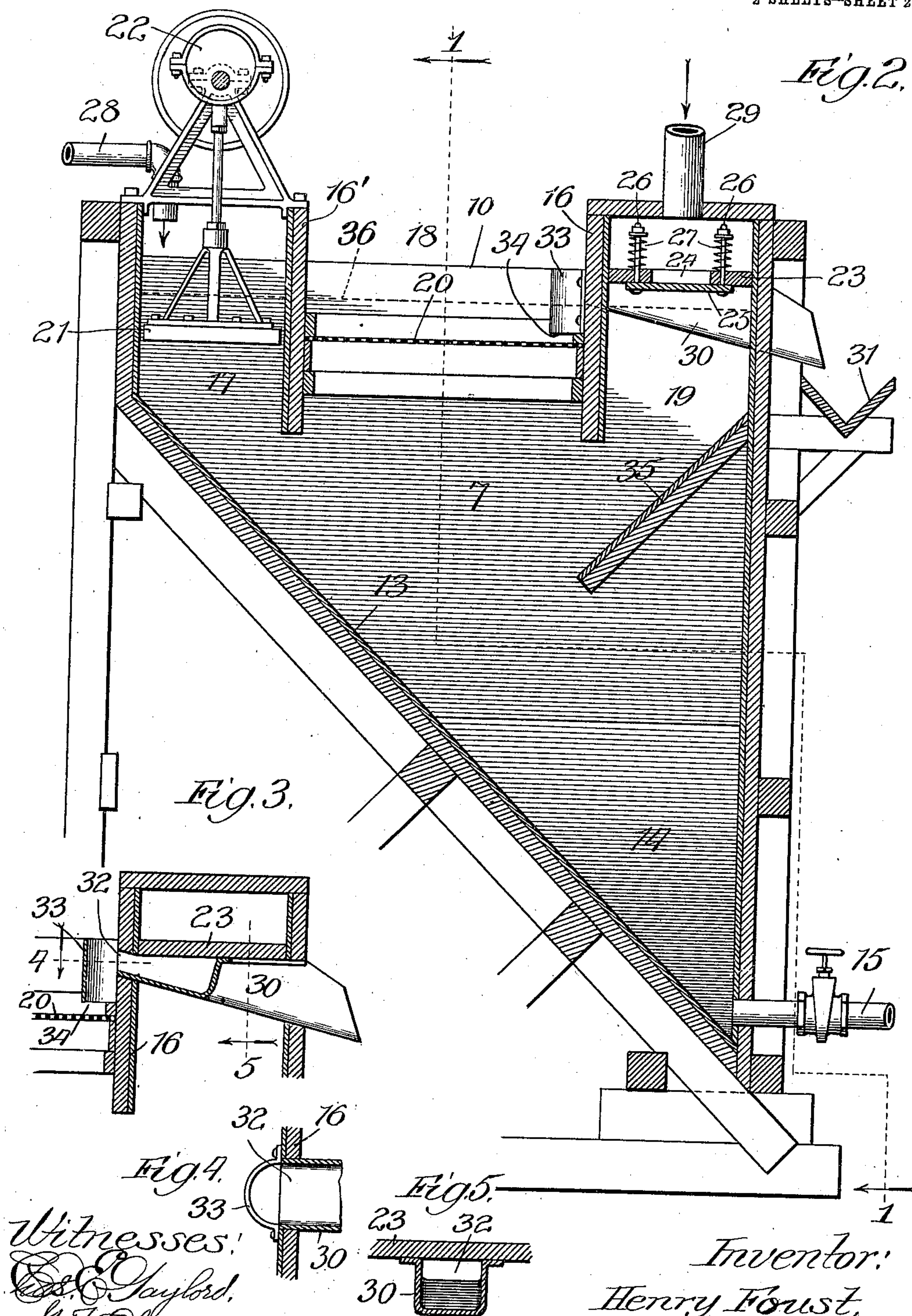
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33-
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UNITED STATES PATENT OFFICE.

HENRY FOUST, OF GALENA, KANSAS, ASSIGNOR OF ONE-HALF TO GEORGE H. WILLIAMS, OF CHICAGO, ILLINOIS, AND ONE-FOURTH TO SYBIL JOHNSON, OF MULLAN, IDAHO.

ORE-JIG.

983,616.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, HENRY FOUST, a citizen of the United States, residing at Galena, in the county of Syracuse and State of Kansas, have invented a new and useful Improvement in Ore-Jigs, of which the following is a specification.

My invention relates to improvement in jigs, for use in ore-concentration, coal-washing, and the like, and of the class wherein the material to be treated is deposited upon a horizontal screen and stratified, more especially according to the specific gravities of its ingredients, by means of water-pulsations directed against the material through the screen. In jigs of this character it is desirable for perfect operation to cause the water-pulsations to be directed with equal force throughout the area of the screen, and for this purpose it has been usual to provide plungers operating at opposite sides of the screen against the water in the hutch. While jigs so constructed produce satisfactory results when the plungers are properly adjusted, and maintain their adjustment to move in perfect synchronism, any slight change in time of operation between them or any variation between them in distance of play, which often occurs in practice, causes an inequality of pressure at different sides of the screen and consequent surging of the water and lack of uniformity in the water-pulsations throughout the jig-bed upon the screen. This lack of uniformity in pressure throughout, during the pulsations, tends to interfere with perfect stratification of the material and consequently perfect separation. Furthermore, the plungers as they rise tend to pull unduly against the jig-bed and draw material which it is desired to keep upon the screen into the hutch.

My object is to provide a jig of the character described which will employ but one plunger for each cell irrespective of the width of the screen and at one side thereof and have the same effect of rendering the pulsations uniform throughout as when two perfectly synchronous plungers are employed, as described, without the disadvantages mentioned that are apt to occur in the use of two plungers.

In the drawings—Figure 1 is a longitudinal section through a three-cell jig provided with my improvements, the section being taken on irregular line 1 in Fig. 2; Fig. 2,

an enlarged broken cross-section taken on line 2 in Fig. 1; Fig. 3, a broken section illustrating the draw-off mechanism of a cell; and Figs. 4 and 5 broken sections taken, respectively, on lines 4 and 5 in Fig. 3 and viewed as indicated by the arrows.

The three cells shown in Fig. 1, namely, the first cell 6, the second cell 7, and the third cell 8, are separated by partitions 9 and 10. 11 is an inlet-spout, or chute, through which the material to be separated is fed, the partition 9 being somewhat lower than the said chute, the partition 10 somewhat lower than the partition 9, and the end, or final discharge, chute 12 being somewhat lower than the top of the partition 10. Each cell has an inclined base 13, terminating in a hopper 14, leading to a valved discharge-pipe 15, and the upper part of each cell is divided by longitudinally-extending partitions 16 and 16¹ into three compartments 17, 18 and 19, respectively, all in open communication at their under sides with the hutch, or main-chamber portion, of the cell. In each compartment 18 is a more or less horizontal screen 20 of suitable mesh extending the full length and width of the compartment; and in each compartment 17, which is in effect a cylinder, is a plunger 21 operated from an eccentric 22. In each compartment 19, well above the level of the screen 20, is a diaphragm 23 having an opening 24 through it closed at its under side by a spring-supported check-valve 25. Each valve 25 is suspended upon pins 26 passing through the diaphragm and surrounded by light, valve-closing springs 27. Discharging into the compartment 17 is a water-pipe 28 and a similar pipe 29 discharges into the compartment 19 above the diaphragm 23. It is to be understood that when the valve 25 is closed the diaphragm is air-tight. In each cell at one side is a draw-off, which may be of any suitable construction, that illustrated consisting of a chute 30 emptying into the trough 31. The draw-off opening 32 to the chute is above the plane of the screen 20 in each instance and extends from behind a semi-circular shield 33 projecting downward to a plane somewhat above the screen to leave the opening 34. Beneath each compartment 19 is a shelf 35, the area of the space between which and the lower end of the partition 16 equals, preferably exactly, that of the space between the lower end of

the partition 16¹ and base 13, whereby the openings between the compartments 17 and 19 and the hutch-portion of the cell are of the same areas.

5 The jig shown and described is adapted for the concentration of three ore-constituents of different specific gravities and their separation from each other and the tailing; and as the general operation of stratifying
10 and discharging the different ore-constituents in jigs of this kind is well understood, a detailed explanation thereof in the present connection is thought to be unnecessary.

Water sufficient to maintain the proper
15 level in each jig-cell enters in equal proportions through the pipes 28 and 29, as it is found to be advantageous to supply the water to the hutch from opposite sides of the screen. In each upward stroke of the plunger water passes downward around the same
20 and, by opening the normally-closed valve 25, water enters also from the compartment 29 above the diaphragm 23. The valve is preferably so adjusted that it will admit
25 in each instance approximately the same amount of water as enters past the plunger in the upward stroke of the latter. In each downward stroke of the plunger water in the hutch is displaced and caused to rise through
30 the screen against the ore thereon, for the well-known purpose. The diaphragm 23 and valve 25 are above the normal level of the water in the jig, which is, say, at the line 36 in Fig. 2, leaving an air-space beneath
35 the valve. Thus, in each downward stroke of the plunger the pressure which causes water to rise through the screen 20 is also exerted to compress the air pocketed beneath the diaphragm 23, whereby in the next
40 upward stroke of the plunger the air in expanding again forces water back from that side of the screen into the hutch. This retrogression of water from the compartment 19 tends, in a large measure at least,
45 to overcome any material suction action beneath the screen, due to the rise of the plunger, and the air-cushion tends to prevent any momentary variation in pressure against opposite sides of the jig-bed. As a consequence the descent of the body of ore and
50 water in the compartment 18, in each instance, will depend upon the gravity thereof alone, which it has been found in practice leads to more desirable results in the matter
55 of stratification of the material and prevents the undue withdrawing of material from the jig-bed into the hutch.

The compartment 19 may be equipped in any other way, than that shown and de-

scribed, to admit the water at that side of
60 the cell and afford the desired air-cushion, and various changes in the construction of the apparatus may be made without departing from the spirit of my invention as generally set forth in the claims. 65

What I claim as new and desire to secure by Letters Patent is—

1. In a jig of the character described, the combination of a cell having a hutch-portion, of a screen above said hutch, a water-
70 pulsator at one side of the screen in open communication with the hutch, and an air-containing compartment at the opposite side of the screen in open communication with
75 the hutch, whereby air in said compartment is alternately compressed and permitted to expand by the operation of the pulsator.

2. In a jig of the character described, the combination of a cell having a hutch-portion, a screen above the said hutch, a water-
80 pulsator at one side of the screen, an air-cushioning compartment also at one side of the screen in open communication with the hutch, and a water-admitting check-valve in
85 said compartment.

3. In a jig of the character described, the combination of a cell having a hutch-portion, a plunger compartment and plunger therein at one side of the screen, an air-cushioning
90 compartment at the opposite side of the screen, a diaphragm in the air-cushioning compartment in a plane above the level of the screen and having an opening through it, a water-admitting check-valve governing
95 said opening, both compartments being in open communication at their lower sides with the hutch, and means for supplying water to each of said compartments.

4. In a jig of the character described, the combination of a cell having a hutch-portion, a screen above the said hutch, a plunger
100 compartment and plunger therein at one side of the screen, an air-cushioning compartment at the opposite side of the screen, a diaphragm in the air-cushioning compartment,
105 above the normal water-level in the cell, having an opening through it, a water-admitting check-valve governing said opening, both compartments being in communication with the hutch through openings of
110 equal area at their lower sides and means for supplying water to each of said compartments.

HENRY FOUST.

In presence of—

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