

L. C. DIBERT.
VIBRATING SHAKER SCREEN.
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941,862.

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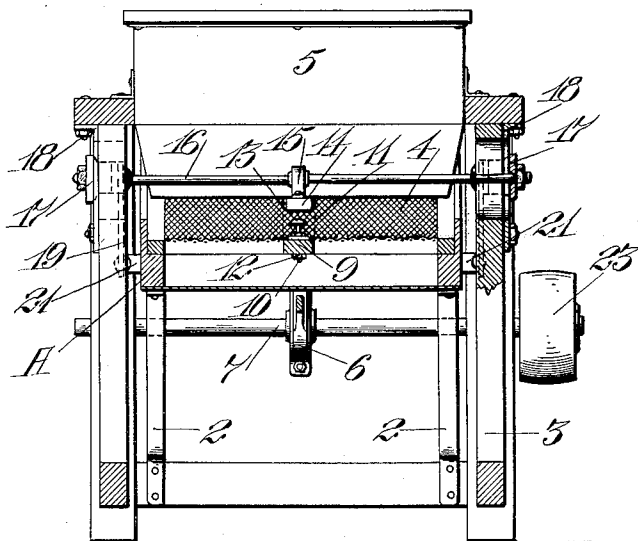
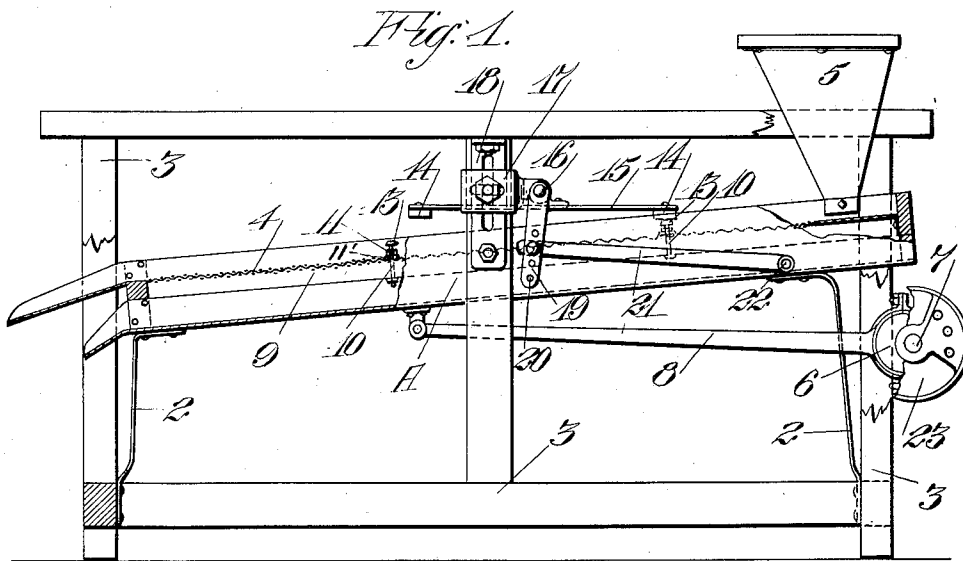


Fig. 2.

WITNESSES

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LOYD C. DIBERT, OF SAN FRANCISCO, CALIFORNIA.

VIBRATING SHAKER-SCREEN.

941,862.

Specification of Letters Patent.

Patented Nov. 30, 1909.

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To all whom it may concern:

Be it known that I, LOYD C. DIBERT, citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Vibrating Shaker-Screens, of which the following is a specification.

My invention relates to screening devices for screening sand, gravel, and other granular or floured substances.

The object of the present invention is to provide a simple, cheap, practical screen arrangement, in which the screen will have a combined vibrating and shaking action, and in which novel means for producing this vibrating motion is provided whereby an accurate and nice adjustment may be effected to produce any desired degree or force of vibration.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the shaker, parts being broken away to show the construction. Fig. 2 is a cross-section of same.

A represents a box or shaker of any suitable size, shape and material, suitably mounted, as on the spring arms 2 which are carried on the main frame 3 of the device. Preferably this shaker A and the screen 4 which it carries are arranged at a suitable incline, so that the material which is fed in from any suitable source of supply through the hopper 5 will travel across the screen or through the box by the combined force of gravity and the shaking action of the box and screen. Any appropriate means may be provided to shake the box, as, for instance, the eccentric 6 on the shaft 7 and the pitman 8 connecting the eccentric with the box. The coöperative action of the eccentric and spring arms 2 when shaft 7 is rotated at suitable speed, gives a rapid reciprocating motion to the shaker, in a manner well known in the art.

The screen 4 which is of any suitable material, as wire mesh or finely perforated sheet-metal, stretched over or secured to a suitable frame, is appropriately supported inside the shaker box A. As here shown, the screen frame rests on suitable side ledges or guides formed inside the shaker, with a clearance of an inch or more between the screen and the bottom of the shaker A. Run-

ning lengthwise of the screen and secured to the end cross pieces of the screen frame is a bar 9 on which, or to which, the screen is attached. Secured in this bar at suitable points between its ends are bolts 10 which pass vertically through the screen and bar and are secured thereto by the opposed jam nuts 11—12; a piece of rubber 11' or the like being preferably interposed between the top nut 11 and the adjacent screen surface, so as to reduce the noise and prevent crystallization of the screen when the machine is in operation. The bolts 10 project a suitable distance above the bar 9 and their heads 13 form suitable anvil surfaces for the fiber knockers 14 which are carried on an oscillating spring bar 15. This spring bar 15 is suitably secured to a rock shaft 16 which extends crosswise of the shaker and is suitably secured in adjustable bearing boxes 17 mounted on the frame A. As shown in Figs. 1 and 2, these bearing boxes 17 are transversely slotted and are vertically adjustable in the slotted brackets 18. Secured to the rock shaft is a crank arm 19 which has a series of perforations 20 whereby one end of a link 21 is adjustably secured to the crank arm at varying distances from the rock shaft, the other end of the link being secured to the shaker, at 22.

From the foregoing, it will be understood that when the shaft 7 is rotated the shaker will be given a lengthwise reciprocating motion, and at the same time the spring tappet arm 15 will be oscillated so that the tappet members 14 will alternately strike on the anvils 13 and impart a rapid vibrating motion in a vertical direction to the screen synchronously with the reciprocations of the screen.

Preferably the rock shaft 16 is arranged about centrally of the screen, with a tappet 14 and its corresponding anvil 13 on each side of the center. Consequently, by making the spring tappet arm 15 longer or shorter, and correspondingly disposing the anvils 13, the tappets 14 will act alternately on portions of the screen on either side of the center of the latter.

The adjustments provided by the hanger 17 and the perforated crank arm 19 permit a longer or shorter, or harder or lighter blow to be delivered by the tappets 14, and correspondingly increase or decrease the force or amount of the vibrations of the screen. This

adjustment is quite important, because in screening some kinds of material it is desired to strike the anvils a harder blow than where working with other materials.

5 Dropping the point of connection of the link 21 with the arm 19 shortens the stroke of the arm, and correspondingly shortens the arcs of movement of the tappets; and conversely, connecting the link 21 to the crank
10 arm 19 at a point closer to the rock shaft results in a longer swing to the tappets. Raising or lowering the hangers 17 enables the tappets to be adjusted vertically with respect to the anvils.

15 In practice, the eccentric or crank shaft 7 is set in rapid motion to give the desired shaking effect to the shaker. The material which is fed through the hopper passes on to the screen, and the finer stuff passes
20 through the screen on to the bottom of the shaker and is collected separate from the material which is too coarse to pass through the screen. The object of the tappets is to keep the screen in vibration and prevent the
25 shaker from clogging up, and enabling the shaker and screen to handle a very much larger amount of material than it would otherwise be capable of handling. While it is observed that the rock shaft and tappets
30 are hung and supported independently of the shaker, the anvils are carried by the shaker and the tappets are operated by direct connections, as the adjustable link 21, with the shaker.

35 In consequence of the reciprocating motion of the shaker and the oscillating motion of the tappets, the anvils are relatively closer together than are the tappets, because as the screen moves in one direction it carries one anvil into the path of a correspond-
40 ing tappet, and when the shaker moves in the opposite direction it carries the other anvil into the path of the other tappet; the action of the shaker and tappets being so related and timed that a tappet will always
45 strike a blow on a corresponding anvil at each reciprocation in either direction of the shaker.

While I have shown only one spring arm
50 15 and one set of tappets 14, it is manifest that in large shakers any number of these arms and tappets, with corresponding anvils, may be employed.

In order to minimize shock and strain on
55 the parts and to cause the shaker to operate uniformly and smoothly, the driving pulley 23 on shaft 7 is preferably counterweighted so as to counterbalance the driving and driven parts of the apparatus. This
60 counterbalancing is done by partially filling up one side of the pulley and making holes therein and plugging up sufficient of the holes to effect the counterbalance. This method of counterbalancing allows the
65 counterweight to be varied to suit various

drive conditions, conditions of load, etc. It is understood that this drive pulley may be connected with any suitable source of power.

Having thus described my invention, what I claim and desire to secure by Letters Pat-
70 ent is—

1. The combination of a suitably supported shaking screen, means for shaking the screen, means for giving the screen a vibrating motion normal to the line of reciprocation of said screen, said vibrating
75 means comprising a vertically adjustable horizontally disposed rock shaft, vertically slotted hangers in which the ends of said shaft are mounted, an anvil on the screen, a tappet carried by the rock shaft, and connections between one end of the rock shaft and the screen whereby the screen oscillates the tappet on the reciprocation of the screen.
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2. The combination of a shaking screen,
85 means for shaking the screen, a tappet member supported independent of the screen, vertically slotted hangers and a horizontal rock shaft adjustably mounted therein and carrying said tappet member, an anvil member on the screen, said anvil movable into
90 and out of the range of action of said tappet member on the reciprocation of the screen, and connections between the screen and the tappet member for operating the
95 latter directly from the screen.

3. The combination of a suitably supported shaking screen and means for shaking the screen, means acting normal to the line of reciprocation of the screen to vibrate the
100 latter, said vibrating means comprising a rockable tappet member, means whereby said member may be adjusted toward and from the screen, an anvil on the screen adapted to be forcibly struck by said tappet member,
105 an arm having one end fixed to the rockable member, and a link having one end fixed to the free end of the arm and having the other end connected directly to the shaking screen, for oscillating the tappet member synchronously with the reciprocations of the screen,
110 and means for varying the force of the blow delivered by said tappet member on said anvil member.

4. The combination of a suitably mounted
115 shaker, means for reciprocating the shaker, a screen supported in the shaker and movable therewith, a pair of anvil members carried by the screen, a rock shaft supported independent of the shaker and disposed between the anvil members, vertically slotted
120 hangers in which the ends of said rock shaft are mounted, means whereby the shaft may be adjusted vertically, tappet members on said rock shaft, connections between the rock
125 shaft and the shaker, said connections including an arm fixed to the end of the rock shaft and extending downwardly, and a link having one end connected to the lower free end of said arm and having the other end
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connected to said shaker, and means for varying the stroke of the tappets.

5 The combination of a suitably supported shaking screen, means for shaking the screen, a vertically adjustable rock shaft supported independent of the screen, means for effecting the vertical adjustment of said rock shaft, a crank arm connected with the rock shaft and an adjustable link connection between the crank arm and the screen,

tappet members on the rock shaft, and corresponding anvil members on the screen.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

LOYD C. DIBERT.

Witnesses:

CHARLES EDELMAN,
C. C. COPP.