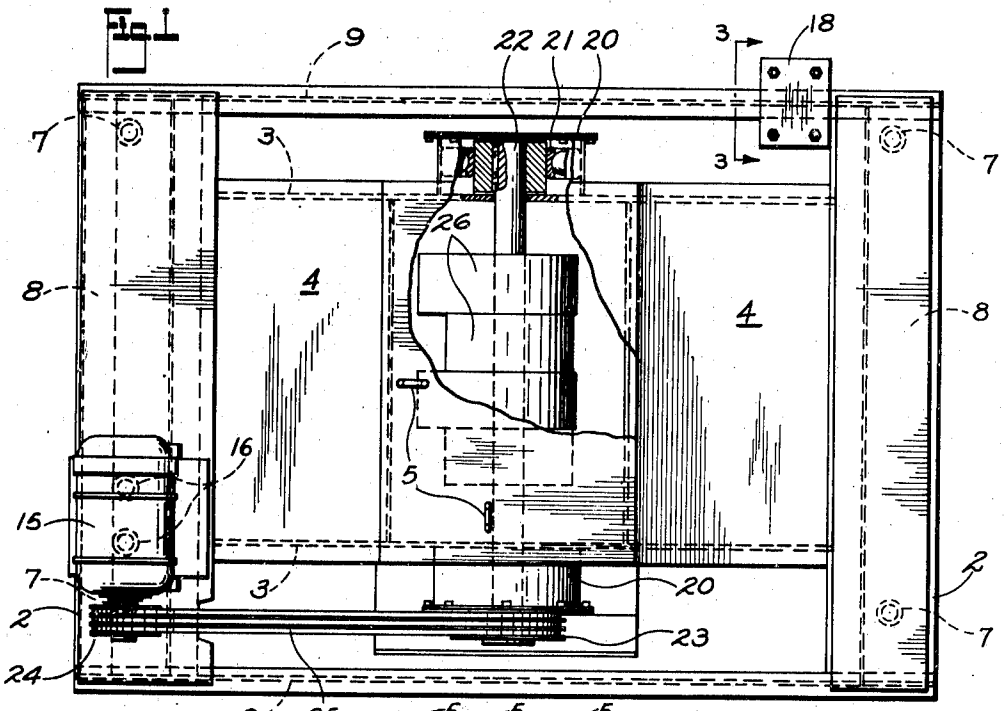
May 31, 1949. E. W. WALLACE 2,471,849

SHAKEOUT FOR COKE CHARGING CARS

Filed March 25, 1948

Fig. 1



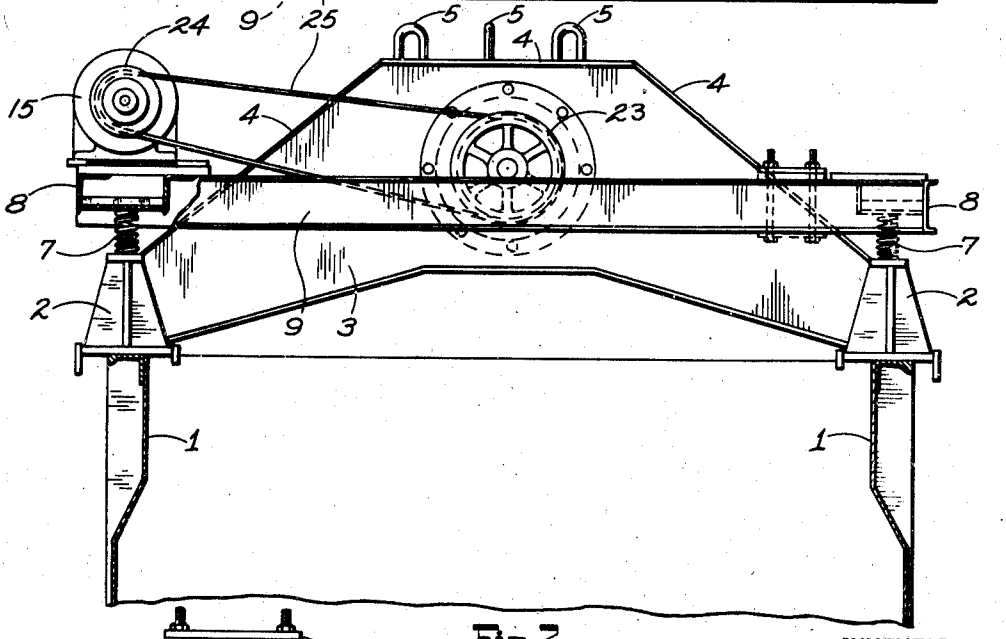


Fig. 3

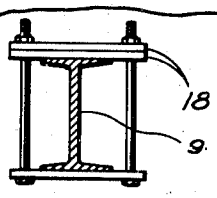


Fig. 2

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SHAKEOUT FOR COKE CHARGING CARS

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3 Claims. (Cl. 214—44)

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This invention relates generally to the art of handling solids and particularly to new apparatus for use in agitating hopper cars for dislodging and discharging granular solids therefrom.

Many solids in granular form are difficult to handle, particularly to dislodge from hopper cars. The sizes of the granules of granular materials may vary widely from very small sizes, such as powders, to large sizes, such as lumps of coal and many different sizes may be present in a given quantity of certain materials. However, regardless of size of granules, the difficulty of dislodging and discharging these materials from hoppers and hopper cars is present with all such materials although possibly to different extents with the different sizes of granules or different kinds of materials.

Numerous efforts have been made by prior workers in the art to provide apparatus which would jar, jolt, agitate or otherwise cause granular material-containing containers, such as hopper cars, to vibrate and thus loosen the granular material and cause it to flow out through an opening provided therefor in the container or car. So far as I am aware, however, none of such devices has been entirely satisfactory.

The present invention solves this long-standing problem in an eminently satisfactory manner for it provides the desired vibration of the solids container with substantial freedom from breakage of parts.

The herein illustrated embodiment of the present invention comprises two rectangular frames with springs interposed therebetween so that one frame may rest on the upper edges of a hopper car and the second frame may be resiliently supported by the first frame on the intervening springs, a motor near one corner of the second frame to rotate an unbalanced body supported by the first frame, and a weight located more or less diagonally opposite to the motor and serving as a partial counterbalance therefor. It will be understood, however, that other modifications of the present invention are comprehended herein and are intended to be included within the scope of what is claimed in the hereinafter appended claims.

In the drawings which accompany and form a part of this specification,

Fig. 1 is a top plan view, with parts broken away and other parts in section, of an embodiment of the present invention suitable for use on a railway hopper car;

Fig. 2 is an end elevational view of the device of Fig. 1; and

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Fig. 3 is a view taken on lines 3—3 of Fig. 1 showing the motor counterweight.

In the drawings, 1 indicates the upper portions of the sides of a railroad hopper car. The shaking device embodying the present invention is shown in Fig. 2 as resting on the top edges of sides 1.

The shaking device illustrated comprises a lower rectangular frame consisting of sides 2 to rest on the upper edges of sides 1 of the car and arched plates 3 connecting the sides 2, and a cover 4 is secured to the top edges of plates 3. Near its midportion cover 4 is provided with lifting lugs 5 by which the device may be suspended from a cable for lifting, lowering and transporting. Adjacent the corners of the lower frame are disposed a plurality of springs 7 which rest on the first or lower frame and support an upper or second frame.

The upper frame is rectangular and consists of side members 8 and cross members 9. A motor 15 is mounted on the upper frame near one corner thereof, and is adjustable toward and away from the longitudinal centerline of the device, i. e., the longitudinal axis of the hopper car. A plurality of springs 16 similar to springs 7 are positioned between the frames beneath the motor. Approximately diagonally opposite motor 15, a weight consisting of plates 18 and approximately equal to one-third of the weight of the motor is attached to the upper frame. This weight partially counterbalances the motor when the device is in operation.

The cross plates 3 of the lower frame are provided with bearing housings 20 which support bearing races 21 in which a shaft 22 is mounted for rotation. A pulley 23, at one end of shaft 22 is aligned with pulley 24 on the rotor shaft of motor 15, and drive belt 25 transmits rotary motion of pulley 24 to pulley 23. Shaft 22 is provided between plates 3 with one or more weights 26 which rotate therewith and which are unbalanced. The unbalancing of these weights may be achieved either by mounting them eccentrically on the shaft 22 or by mounting them concentrically and then adding weight to one side thereof.

The operation of the above described apparatus is substantially as follows: The device, supported from lifting lugs 5, is lowered onto the top of a hopper car to rest on the sides 1 thereof substantially as is shown in Fig. 2. The discharge doors (not shown) in the bottom of the car are opened and the motor 15 is energized. The motor drives belt 25 thereby rotating shaft 22 and

weights 26 thereon. It is believed that the rotation of weights 26 tends to move the lower frame in a circular orbit but that gravity interferes with the tendency of the frame to move upwardly in that orbit and the car interferes with the tendency of the frame to move downwardly in that orbit. Thus, the resulting movement of the frame is in an oval orbit having its major axis in a horizontal plane. The movement of the lower frame induced by the rotating unbalanced weights is transmitted to a certain extent to the upper frame through the springs and, due to the lag in transmission, the movement of the upper frame is not exactly in synchronism with that of the lower frame. However, the two frames are near enough in synchronism to keep the drive belt 25 in driving tightness.

It is believed that the counterweight 18 modifies and tends to equalize the forces applied to the several springs when the device is operating for with the counterweight present the life of the springs is many times that attained when the counterweight is absent. As a result of the present invention and the present combination of parts embodying it, spring breakage has been substantially eliminated as contrasted with almost daily spring breakage prior to this invention.

Having thus described the present invention so that others skilled in the art may be able to understand and practice the same, I state that what I desire to secure by Letters Patent is defined in what is claimed.

What is claimed is:

1. A shaker comprising a rectangular frame having side members to rest on a hopper, a second rectangular frame above said first frame, springs supported by the first frame and supporting the second frame, a motor near one corner of the second frame, a counterweight for the motor on the second frame near the corner diagonally opposite to the motor, and a rotatable, unbalanced body on the first frame and connected to the motor for rotation thereby.

2. A shaker comprising a rectangular frame having side members to rest on the top edges of a hopper, a second rectangular frame above said first frame, springs supported by the first frame near the corners thereof and supporting the second frame, a motor near one corner of the second frame, springs extending from the first frame to the second frame beneath said motor and partially supporting the motor, a counterweight on the second frame near the corner thereof diagonally opposite to the motor and approximating one-third of the motor weight, and a rotatable, unbalanced body on the first frame and connected to the motor for rotation thereby.

3. A car shaker comprising a rectangular frame having side members to rest on the top edges of the sides of a hopper car, cross members connecting said side members, an unbalanced member rotatably supported by said cross members, a second rectangular frame above said first frame, springs between said frames supporting said second frame from said first frame, a motor near one corner of the second frame, a counterweight on the second frame near the corner thereof diagonally opposite to the motor, motor supporting springs between the frames beneath the motor and means connecting the motor and rotatable member for rotating the latter.

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No references cited.