

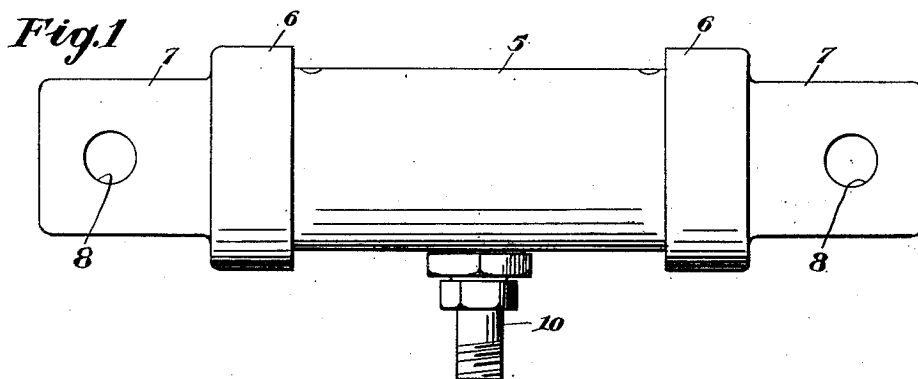
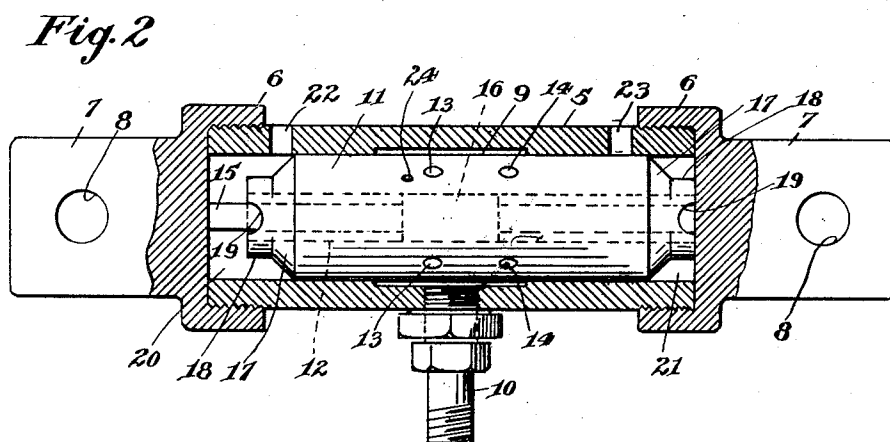
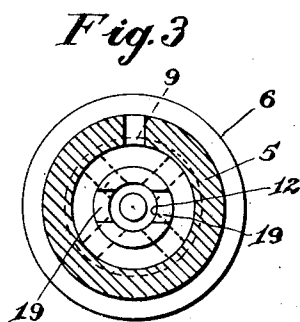
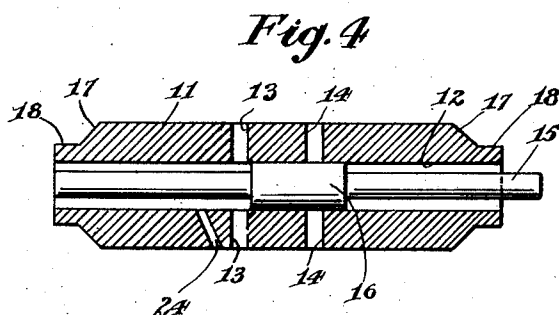
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C. E. SALMONSON

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VIBRATOR

Filed April 4, 1930



INVENTOR.

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VIBRATOR

Application filed April 4, 1930. Serial No. 441,596.

This invention relates to a vibrator adapted to be connected to a molding flask or the like to pack the sand therein by jarring or the like.

5 An object of the invention is to provide a means readily attachable to and detachable from the part or object to be vibrated or jarred.

10 Another object is to provide a vibrator which is of simple construction, including but few parts, and which primarily includes a cylinder, a piston, a source of supply of fluid pressure and means for attachment to the object to be vibrated.

15 Other objects and advantages will become apparent as the description proceeds. While in the accompanying drawings and the following specification a specific embodiment of the invention is disclosed in detail it is to be understood that this is for the purpose of illustration only and that the invention is not limited thereto since references must be had to the annexed claims for a definition of the invention's limitations.

25 In the drawings:—

Fig. 1 is an elevational view of the improved vibrator;

Fig. 2 is a longitudinal sectional view thereof;

30 Fig. 3 is a sectional view on the line 3—3 of Fig. 1; and

Fig. 4 is a longitudinal sectional view of the piston.

Referring in detail to the drawings, at 5 is shown a cylinder or casing having its ends threaded and closed by caps 6, each shown provided with an attachment lug 7, which may be perforated as at 8 or otherwise formed for attachment to the object to be shaken or vibrated. In this connection it is to be noted that while each cap 6 is shown as equipped with an attachment lug 7, such is not always necessary and in such case a plain cap lacking the lug 7 may be used.

45 Internally and midway between its ends the cylinder 5 is recessed to provide a cylindrical pocket or receptacle 9 to which fluid, preferably air under pressure, is supplied as through a one-way valve 10.

50 Operating within the cylinder 5 is a piston

11 largely filling the cylinder as shown. Piston 11 has a longitudinal opening 12 extending entirely through it and which midway its ends is entered by sets of openings 13 and 14, four openings being shown in each set. These ports 13 and 14 are disposed in the cylindrical pocket 9.

Disposed through the longitudinal opening 12 of the piston 11 is a rod or bar 15 extending the length of the cylinder 5 and at its ends abutting the caps 6 whereby said rod is held against endwise movement. Midway its ends rod 15 is enlarged as at 16 to provide a valve for alternately closing the ports 13 and 14.

As clearly shown in Fig. 2 piston 11 substantially fills the cylinder 5 and at its ends the piston is reduced to provide shoulders 17 and end extensions or abutments 18, each of the latter being cut away or radially grooved as at 19 providing communication between the opening 12 and the end spaces 20 and 21 between the shoulders 17 and the caps 6. Adjacent the ends of cylinder 5 are sets of exhaust ports 22 and 23.

In the operation of the device, one of the lugs 7 is anchored or attached to the object to be vibrated. The opposite end of cylinder 5 may be anchored by the cap of its lug 6 or it may be provided with a plain cap.

Air under pressure enters the chamber 9 through valve 10, and (referring to the device with the piston in the position shown in Fig. 2) enters the ports 14, the ports 13 being closed by valve or enlargement 16. The air passes to the right (Fig. 2) through the opening 12 and enters chamber or compartment 21 through the openings 19 in extension 18, and acting against shoulder 17 moves the piston to the opposite end of cylinder 5.

Should the piston remain central when the vibrator has been stopped so that all of the ports would be in register with the enlargement 16, and thereby close communication and form a dead center, I provide a single relatively small additional port 24 in one end portion of the cylinder so as to thereby take in sufficient air with the turning on of the air, to send the piston to one end of the

cylinder, and thereby begin operation of the same. This means obviously takes the place of springs which have heretofore been very commonly used in vibrators of this type, and serves a definite means of insuring an easy starting of the vibrator without the use of springs which are liable to get out of order and make trouble.

Now valve 16 will be disposed with relation to the piston as shown in Fig. 4. With the ports thus relatively disposed ports 14 are closed and ports 13 are open. Now air enters the ports 13, passes to the left through opening 12, entering the chamber or compartment 20 through openings 19 and forcing the piston 11 in the opposite direction. Each time the piston is moved from one end of the cylinder to the other the exhaust ports 22 and 23 are opened to permit the escape of the air in the chambers 20 and 21. For example, while air is entering ports 13, exhausts 23 are open and while air is entering ports 14 exhausts 22 are open. It will be obvious that piston 5 controls the exhausts.

Having thus described the invention what is claimed is:

1. In a vibrator, a cylinder having closed ends, a central annular intake pocket intermediate the cylinder and piston, a central rod having an enlarged intermediate portion and its two ends positioned against the inside of said cylinder ends, a piston having a central opening therethrough and two or more spaced apart radial ports and adapted for longitudinal movement on the rod, said piston being shorter than the rod and having reduced end portions to strike the cylinder's ends and to form end pockets therein, and exhaust ports through the cylinder leading from the end compartments, the said radial ports being so positioned in the piston as to be opened and closed by the movement of said piston upon and with respect to the central enlargement of the rod.

2. In a vibrator, a cylinder having closed ends, a central annular intake pocket intermediate the cylinder and piston, a central rod having an enlarged intermediate portion and its two ends positioned against the inside of said cylinder ends, a piston having a central longitudinal opening therethrough slidably mounted on said enlarged intermediate portion of the rod and shaped to form an annular compartment around both end portions, there being separate longitudinal openings in each end portion of the piston extending outward to the annular compartment from the said enlargement and adapted to alternately communicate with the two said compartments, radial ports extending through the cylinder from the said annular pocket to the said end compartments of the cylinder, and exhaust ports through the cylinder leading from the end compartments, the said radial ports being so positioned in

the piston as to be opened and closed by the movement of said piston upon and with respect to the central enlargement of the rod.

3. In a vibrator, a cylinder having closed ends, a central annular pocket in its inner wall and through which an air inlet is provided, a central rod having an enlarged intermediate portion and its ends positioned against the inside of said cylinder ends, a piston having a central longitudinal opening therethrough slidably mounted on said enlarged intermediate portion of the rod to alternately strike the ends of the cylinder and being shorter than the rod and being shaped to form a pocket between it and each end of the cylinder, there also being radial inlet ports extending through the piston from its central longitudinal openings, and exhaust ports through the cylinder leading from the end portions thereof, the said radial ports being so positioned in the piston as to be opened and closed by the movement of said piston upon and with respect to the central enlargement of the rod.

4. In a vibrator, a cylinder having closed ends, a central annular pocket in its inner wall and through which an air inlet is provided, a central rod having an enlarged intermediate portion and its ends positioned against the inside of said cylinder ends, a piston slidably mounted on said enlarged intermediate portion of the rod and being shorter than the rod and being shaped to form an annular compartment around both end portions, there being longitudinal openings extending through the end portions of the piston and communicating with the said inner annular pocket in the cylinder, and exhaust ports through the cylinder leading from the end portions thereof, the said inlet ports being so positioned in the piston as to be opened and closed by the movement thereof upon and with respect to the central enlargement of the rod in a manner to alternately supply air to the ends of the piston.

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 2nd day of April A. D. 1930.

CARL E. SALMONSON.