March 21, 1950 F. E. CHILCOTT 2,501,158

FORM VIBRATOR

Filed Sept. 20, 1948

FIG. 1.

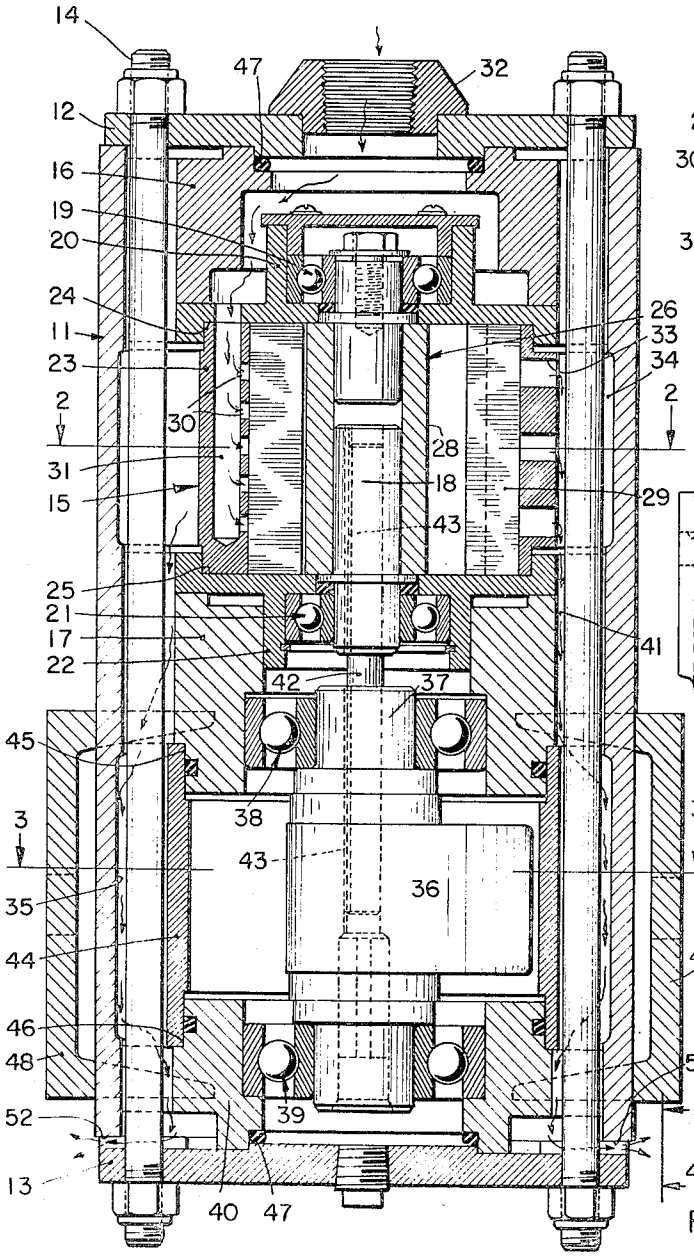


FIG. 2.

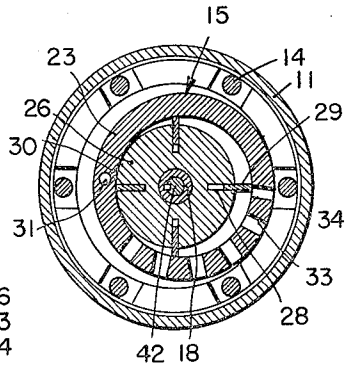


FIG. 3.

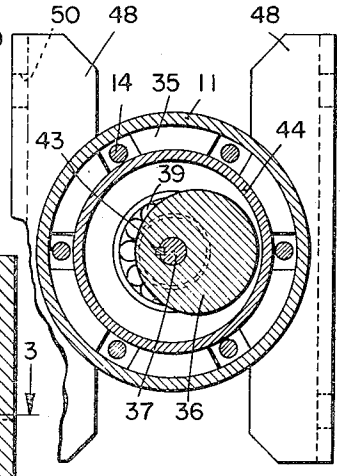


FIG. 4.

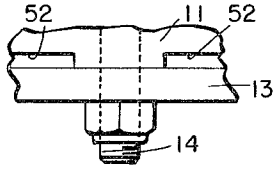


FIG. 5.

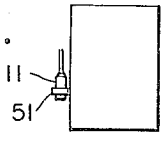
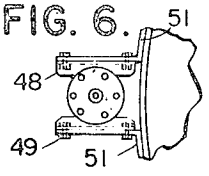


FIG. 6.



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FORM VIBRATOR

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3 Claims. (Cl. 259—1)

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This invention relates to a vibrator for attachment to forms for molding concrete.

One object of the invention is to provide a compact vibratory device adapted for use on forms for molding concrete. Another object is to provide a form vibrator actuated by compressed air. Another object is to provide means for cooling a vibratory mechanism adapted for use on forms for concrete construction.

These and other objects are attained by my invention which will be understood from the following description and the accompanying drawings in which

Figure 1 is a side elevational view partly in section showing a preferred form of my vibrator;

Figure 2 is a cross-sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a cross-sectional view taken on the line 3—3 of Figure 1;

Figure 4 is a fragmentary side elevational view taken from the position 4—4 of Figure 1;

Figure 5 is a side elevational view showing the mounting of my vibrator on a concrete pipe form; and

Figure 6 is a top plan view of the arrangement shown in Figure 5.

Referring to the drawings which show a preferred form of my vibrator for concrete construction forms, a cylindrical housing 11 is provided with a top plate 12 and a bottom plate 13 held together by bolts 14 spaced in holes adjacent the outer edges of the circular top and bottom plates and extending therebetween. A compressed air motor indicated generally at 15 is mounted within the cylindrical housing 11, being spaced from the top plate 12 by the annular support member 16 and supported on the central support member 17, which is spaced laterally from the walls of the housing 11. The air motor consists of the shaft 18 mounted in top bearings 19 which are supported by the motor top cover plate 20. At the bottom of the air motor, the shaft 18 is supported for rotation in the lower air motor bearing 21 which is mounted on the motor bottom plate 22. The motor cylinder 23 is arranged with its inside cylindrical surface oriented eccentrically with respect to the motor shaft 18, being held in position between the motor top cover plate 20 and the motor bottom plate 22 in the recesses 24 and 25 respectively which are provided on the opposed inside faces in said top and bottom plates. The rotor 26 which is keyed to the shaft 18 by the key 27 is provided with four radial slots 28 extending for the full length of the rotor from the top to the bottom of the working chamber of the motor

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cylinder 23. Radially moving vanes 29 are provided in the slots 28, these vanes being of sufficient length to at all times close the gap between the periphery of the rotor and the inner wall of the motor cylinder 23. The vanes 29 are preferably made of compressed hard fiber and are fitted to slide easily in the radial slots 28 so that they will be fully extended against the inner wall of the motor cylinder by centrifugal force when the motor is revolved. Compressed air is admitted to the motor from inlet openings 30 arranged in a vertical row in the wall between the inside cylinder wall and the inlet duct 31 which is in communication with the inlet fitting 32. The motor cylinder 23 is also provided with a plurality of outlet ports 33 through the cylinder walls at positions generally opposite the inlet openings, and arranged in the well known manner of vane motor exhausts. The air leaving the outlet port 33 is discharged into the annular space 34 around the air motor cylinder 23 and, as will be described later, around the vibrator.

The vibrator consists generally of an eccentrically mounted weight 36 mounted on a vibrator shaft 37 which is supported in an upper vibrator bearing 38 mounted in the central support member 17, and in a lower vibrator bearing 39 mounted in the vibrator support 40, which rests upon the bottom plate 13. The vibrator shaft 37 is operatively connected to the air motor shaft 18 by a piece of connecting shaft 42 with keys 43, this arrangement permitting easy disassembly and compensating for unequal expansions. The shafts of both eccentric weight and motor may be unitary. The eccentric weight 36 is enclosed by the sleeve 44 which fits into an end peripheral groove 45 in the central support member 17 and in the end peripheral groove 46 in the lower vibrator support 40. The annular support member 16, the central support member 17, the lower vibrator support 40, the sleeve 44, the motor top plate 20, the motor bottom plate 22, and the motor cylinder 23 are all fitted and held together by the bolts 14 extending between the top plate 12 and the bottom plate 13 of the assembly, O rings being provided as indicated at 47 to prevent leakage of air and lubricant.

The air exhausted from the air motor passes from the annular space 34 outside the motor cylinder 23 into the annular space between the inside wall of the housing 11, then into the annular space 41 around the central supporting member 17, then into the annular space 35 around the sleeve 44, and the lower vibrator support 40, finally being discharged through discharge slots

52 through the lower edge portion of the housing 11.

The vibratory device is adapted to be removably mounted, with the shaft generally in a vertical position, by means of the opposed channel members 48 which may be welded to the walls of the housing 11, by bolts 49 in the holes 50, to the brackets 51 which are attached to the form which is to be vibrated.

The vibratory device is attached, for example, to the form in which concrete is to be molded, and during and after the filling of the mold with wet, unset concrete, the vibrator is operated by compressed air until the concrete mass has been satisfactorily compacted. The vibratory device may then be moved to another form or another position.

The advantages of my vibratory device will be readily understood from the above description of its construction and use. The wearing parts may be readily renewed and replaced in this device because of the simplicity of its assembly and disassembly. The unit is compact, portable, is rugged enough to withstand the type of rough service to which it is subjected. It produces strong vibrations for long periods of time without overheating, even when attached to heavy forms, because of the utilization of the exhaust air from the air motor as a cooling means around the moving parts.

I claim:

1. A vibratory device adapted for vibrating concrete construction forms comprising a housing including means for detachably mounting said device to a form; a compressed air motor spaced away from the walls of said housing but within said housing, said motor having its shaft extending through said motor into an eccentric weight chamber; an eccentric weight rotary vibrator means arranged in end-to-end axial relation with said motor within said housing, the shaft of said eccentric weight being rigidly connected to the shaft of said motor; and ducts around said motor and said vibratory means connected to the outlet ports of said motor and adapted to provide cooling means for said motor and said vibratory means.

2. A vibratory device adapted for vibrating concrete construction forms comprising a housing including means for attaching said device to a form; an air vane motor within and spaced from the walls of said housing, said motor having its shaft extending through said motor into an eccentric weight chamber; inlet means adapted to convey compressed air to said motor; motor exhaust ports for said motor adapted to discharge air into the space between said motor and said housing; an eccentric weight chamber arranged in end-to-end axial relation with said motor, and having an outer wall spaced away from the inner walls of said housing; an off-center weight in said chamber rigidly attached to the said extension of said shaft; conduit means for carrying the exhaust air from the motor exhaust ports to the space surrounding said motor and said chamber; and discharge ports for said exhaust air through said housing adjacent the end containing said vibratory means, said discharge ports being distributed around said housing at the end remote from said motor.

3. A vibratory device adapted for vibrating for concrete construction forms comprising a housing including means for attaching said device to a form; a compressed air intake in one end of said housing; an air vane motor within and spaced from the walls of said housing, said motor having its shaft extending through said motor into an eccentric weight chamber; upper and lower bearings for said shaft at the ends of said motor; inlet ports connected to said air intake adapted to convey compressed air to said motor over said upper bearing; motor exhaust ports for said motor adapted to discharge air into the space between said motor and said housing; an eccentric weight chamber arranged in end-to-end axial relation with said motor, and having an outer wall spaced away from the inner walls of said housing; an off-center weight in said eccentric weight chamber rigidly attached to the said extension of said shaft; bearings for said shaft at the ends of said weight chamber; conduit means for carrying the exhaust air from the motor exhaust ports to the space surrounding said motor and said weight chamber; and discharge ports for said exhaust air through said housing adjacent the end containing said vibratory means, said discharge ports being distributed around said housing at the end remote from said motor.

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