

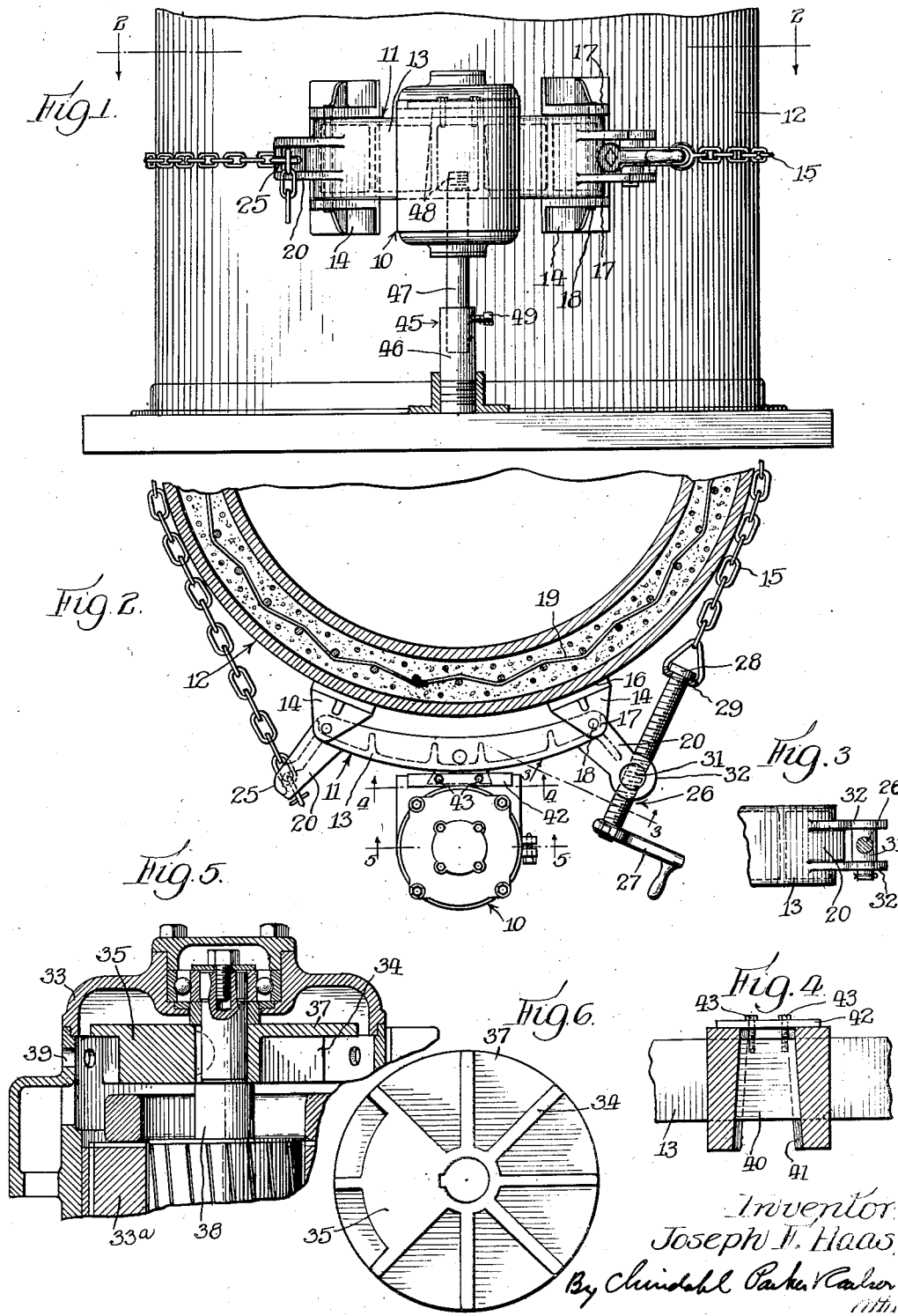
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VIBRATING DEVICE

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VIBRATING DEVICE

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The invention relates generally to vibrating devices and in particular to devices of this character which are adapted for use in compacting concrete in forms or molds.

In the use of vibrators for producing the maximum strength and density in concrete it is necessary to attach the vibrator to forms of various shapes and sizes. For example, the vibrator may be used on round or square column forms of various sizes or it may be used on various sizes of round forms for molding concrete pipe.

An important object of the present invention is to provide a supporting structure for a vibrator adapted to be readily secured on forms of various sizes and shapes and arranged to transmit the movement of the vibrator efficiently to the forms regardless of their size or shape.

Another object is to provide such a supporting structure adapted to be positioned on one side of a form such as a column form with a band extending around the form and tightened to press the structure against the form, and embodying means whereby the structure may be pressed against the form with sufficient force to insure proper transmission of the vibratory movement but without applying excessive force to the band.

Another object is to provide such a supporting structure which is adapted to be mounted in position on the form by a single workman.

It has been found that when a vibrator, the character herein shown, is operated while supported on a concrete form or the like, there is a tendency to generate heat in the supporting means which is transmitted to the vibrator casing. This heat, when added to the heat normally generated by the motor, causes rapid deterioration of the windings of the motor, and another object of the present invention is to provide a vibrating device of this character which does not become unduly heated when operated.

Another object is to provide a motor driven vibrator of improved and simplified construction embodying a motor and a combined fan and unbalancing weight.

Other objects and advantages will become

apparent from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a front elevational view of a vibrating device embodying the invention in its preferred form, the device being shown in operative relation to a round column form.

Fig. 2 is a fragmental sectional view taken along the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 2.

Fig. 5 is an enlarged fragmental section taken along the line 5—5 of Fig. 2.

Fig. 6 is an elevational view of the combined fan and unbalancing weight.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

In the preferred form herein shown, the invention is embodied in a device having a motor operated vibrator 10 detachably secured in a central position on a supporting structure 11 which is adapted to be fixed upon a form such as a cylindrical column form 12. The supporting structure 11 comprises an elongated beam 13 with abutment shoes 14 pivoted on vertical axes at the opposite ends of the beam 13 whereby to adapt the structure for mounting upon forms of various sizes and shapes. The supporting structure 11 has a securing band 15 preferably in the form of a chain adjustably secured to the opposite ends of the beam 13 and adapted to extend around the column form 12 to clamp the shoes 14 firmly against the form.

In the embodiment shown, the beam 13 is of channel cross section and is slightly arcuate to facilitate its use on cylindrical forms. The shoes 14 are provided with a broad surface 16 for engaging the form and are of a

substantial length transversely of the beam whereby to provide a firm contact with the form when the supporting structure is secured in position and thereby insure efficient transmission of the vibratory movement to the form. A pair of spaced lugs 17 formed on each of the shoes 14 extend along opposite edges of the beam 13 near the ends thereof and are pivoted to the beam by means of pivot pins 18 extending vertically through the lugs 17 and the beam 13. Thus, when the support is applied to a particular form 12, the shoes 14 may pivot around the pins 18 until the surfaces 16 of the shoes are properly engaged with the outer surface of the form. When the shoes 14 have been properly positioned with relation to the form, the chain 15 is tightened to draw the shoes into firm abutment with the form so that motion in the beam 13 will be efficiently transmitted to the form and will cause the concrete to flow about the reinforcing bars 19 within the form.

The firmness of the mounting of the supporting structure 13 is, of course, dependent upon the amount of force applied to the shoes 14 perpendicular to the surface of the form, and the present embodiment of the invention is arranged to apply such force in the desired amount without exerting an undue great stress upon the chain 15. This is accomplished by forming arms 20 on the opposite ends of the beam 13 projecting outwardly from the normal position of the shoes 14 and by attaching the opposite ends of the chain 15 to the outer ends of the arms 20. Thus, when the chain 15 is tightened about the form, the ends of the chain are positioned at an angle to the arms 20 and a comparatively large component of the force applied to the chain 15 is transmitted to the shoes perpendicular to the surface against which the shoes bear. By this arrangement the shoes may be clamped against the form 12 with sufficient force to insure proper transmission of the vibratory movement without applying an undue stress to the chain.

To adjust the chain 15 about a particular form 12, one of the links adjacent one end of the chain is positioned in a narrow notch 25 formed in the end of one of the arms 20 and the adjacent link, being transversely disposed with relation to the notch 25, prevents longitudinal displacement of the chain. When this rough adjustment of the link of the chain has been made, the chain is tightened about the form 12 by power multiplying means in the form of a screw-threaded adjusting device 26 mounted at the end of the other arm 20 and permanently secured to the other end of the chain 15. The adjusting device 26, as herein shown, is in the form of a screw threaded shaft having a handle 27 at one end thereof for rotating the shaft and a head 28 at the other end thereof to which the end of the chain 15 is rotatably secured

by means of a swivel head 29 surrounding the shaft and connected to the adjacent link of the chain. The adjusting device 26 is mounted on the arm 20 by means which permits the angular relation of the adjusting device to the arm to be varied in accordance with the size of the form upon which the device is mounted. This is accomplished by threading the device 26 through a suitable stub shaft 31 rotatably mounted in vertically spaced lugs 32 formed on the end of the arm 20.

The vibrator 10, herein shown, is motor operated and has a motor 33^a mounted within a housing 33, Fig. 5. Preferably the vibrator 10 embodies a fan 34 for cooling the motor and in the form shown the fan 34 is formed integrally with the unbalancing weight 35. This construction is shown in detail in Figs. 5 and 6 and the fan will be seen to comprise a disk 37 adapted to surround and be secured to the motor shaft 38 and on the side of the disk adjacent the motor, the radial blades of the fan 34 are formed. When the motor is operated, the blades of the fan 34 serve to force the air out of the motor housing 33 through a plurality of apertures 39 formed in the housing in alignment with the ends of the blades. By this construction the over-all length of the motor housing is reduced without changing the efficiency of the device as a vibrator.

The vibrator housing 33 is preferably formed separately from the beam 13 so that when occasion arises the vibrator may be moved from one supporting structure to another. The connection between the vibrator casing and the beam 13 is, therefore, arranged to permit the vibrator to be quickly detached from the beam. This connection, of course, must be of a character that it will transmit the vibratory movement efficiently from the vibrator to the beam, and in the present case it comprises a member 40 of dove-tailed horizontal section formed on the beam 13 and arranged to be engaged by a complementary dove-tailed socket 41 formed on the vibrator housing 33. Preferably the dove-tailed member 40 and the socket 41 are tapered upwardly so that the weight of the vibrator will tend to maintain the two elements of the connection in a wedged relation. In order to prevent relative movement between the wedge member 40 and the socket 41, the device is preferably provided with a bar 42 arranged to extend across the open upper end of the socket 41 and having a pair of lag screws 43 extending downwardly through the bar and engaging the dove-tailed member 40. Thus, by tightening the screws 43 the vibrator may be drawn downwardly and the walls of the socket 41 held in firm abutment with the sides of the dovetailed member 40. It has been found that this construction avoids the generation of heat in the supporting structure

thereby prevents excessive heating of the motor.

In the use of the device it is desirable that the supporting structure be mounted on the form by a single workman and this is facilitated through the provision of a standard 45 which may be used to maintain the structure in the desired position adjacent a form 12 while the workman carries the end of the chain around the form and engages the loose end thereof with the notch 25 in one of the arms 20. The standard 45, as herein shown, is formed in two telescoping parts, the lower one of which is in the form of a pipe 46 adapted to rest upon the ground or the floor beside the form while the other part of the standard consists of a small pipe 47 positioned within the pipe 46 and extending upwardly therefrom for screw threaded connection with the beam 13, as indicated at 48 in Fig. 1. When the pipe 47 has been connected to the beam 13 the supporting structure 11 is positioned at the desired height beside the form 12 and the two members 46 and 47 of the standard are extended until the lower end of the member 46 engages the floor. The member 47 is then fixed with relation to the member 46 by means of a screw 49 extending through the member 46 and engaging the member 47. After the structure 11 has been clamped firmly in position on the form by means of the adjusting device 26 the screw 49 may be loosened and the standard removed by unscrewing the connection 48.

From the foregoing it will be apparent that the invention provides a supporting structure for a vibrator which may be readily applied to forms of various sizes and fastened in such a manner that the movement of the vibrator will be transmitted efficiently to the form. It will also be apparent that it is not necessary to apply an excessive crushing force to the form in order to secure the vibrator properly upon the form. The construction herein shown is also of particular advantage since it may be applied to a form by a single workman.

It will also be seen that the invention provides a vibrating device which will not become unduly heated and which is, therefore, capable of continued use over long periods of time.

It will also be seen that by employing a vibrator in which the fan and unbalancing weight are integrally formed, the vibrator may be made comparatively small without reducing its efficiency.

I claim as my invention:

1. A device of the character described comprising, in combination, a supporting structure adapted to be secured upon a column form or the like, means adapted to extend about a form to secure the support in position thereon, and a standard adapted to carry the weight of said support while said securing

means is adjusted and tightened about the form, said standard being removable after the supporting structure has been secured in position.

2. A device of the character described comprising, in combination, a supporting structure adapted to carry a vibrating device and to be secured in abutment with a column form or the like, means adapted to extend about a form to secure the support in position thereon, and a standard for carrying the weight of said support while the securing means is adjusted, said standard comprising two telescoping members, one of which is adapted to be detachably connected to the supporting structure and the other of which is adapted to rest on the floor beside the form, and means for fixing the two members of said standard at any desired length.

3. A vibrator of the character described comprising, in combination, a motor having a casing, a fan mounted on the shaft of said motor and an unbalancing weight formed integrally with said fan.

4. A device of the character described comprising a supporting structure adapted to be secured in position on a form, a vibrator, means on said vibrator and said supporting structure providing wedging surfaces adapted to be engaged to support said vibrator on said structure, and clamping means operable to secure said wedging surfaces in firm abutment with each other.

In testimony whereof, I have hereunto affixed my signature.

JOSEPH F. HAAS.