Aug. 29, 1950 P. F. CONNOLLY ET AL 2,520,833

CONCRETE COMPACTING DEVICE

Filed March 8, 1946 4 Sheets-Sheet 1

Fig. 1.

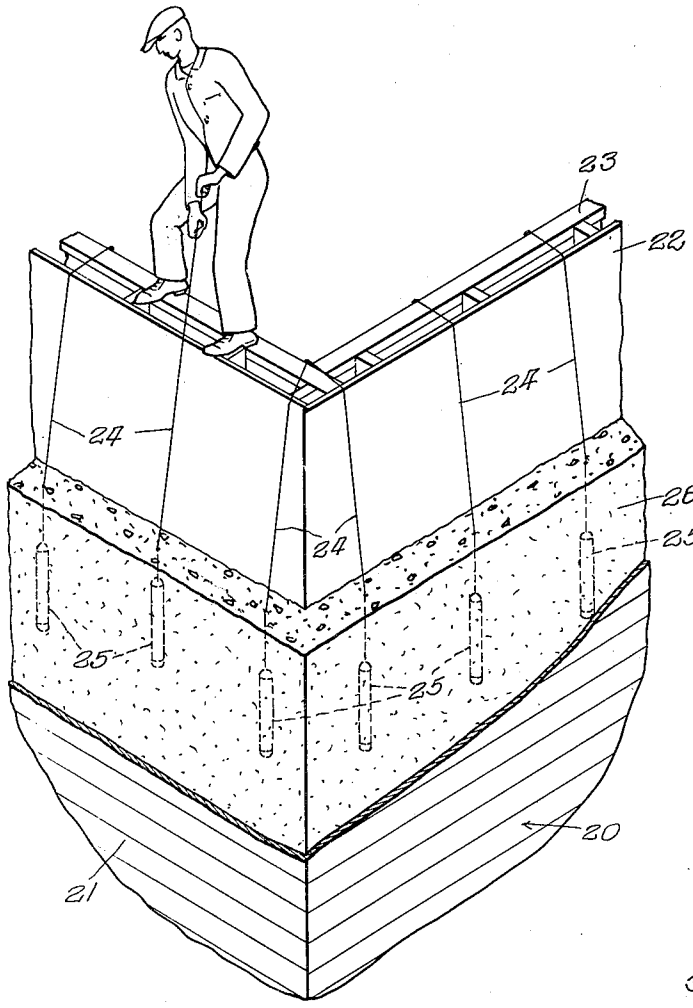


Fig. 2.

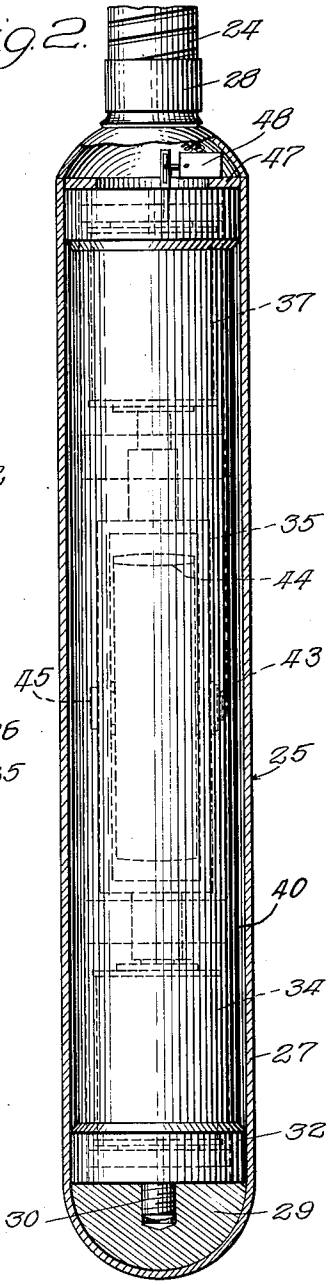
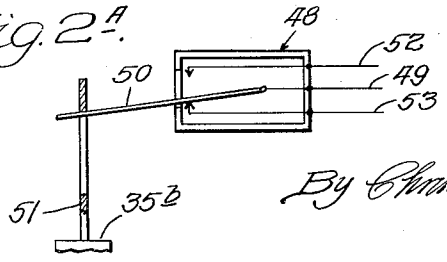


Fig. 2A.



Inventors:
Peter F. Connolly,
Charles H. Holmstrom,
By Christy, Schroeder, Merriam & Wolgren,
Attys.

Aug. 29, 1950 P. F. CONNOLLY ET AL 2,520,833

CONCRETE COMPACTING DEVICE

Filed March 8, 1946 4 Sheets-Sheet 2

Fig. 3.

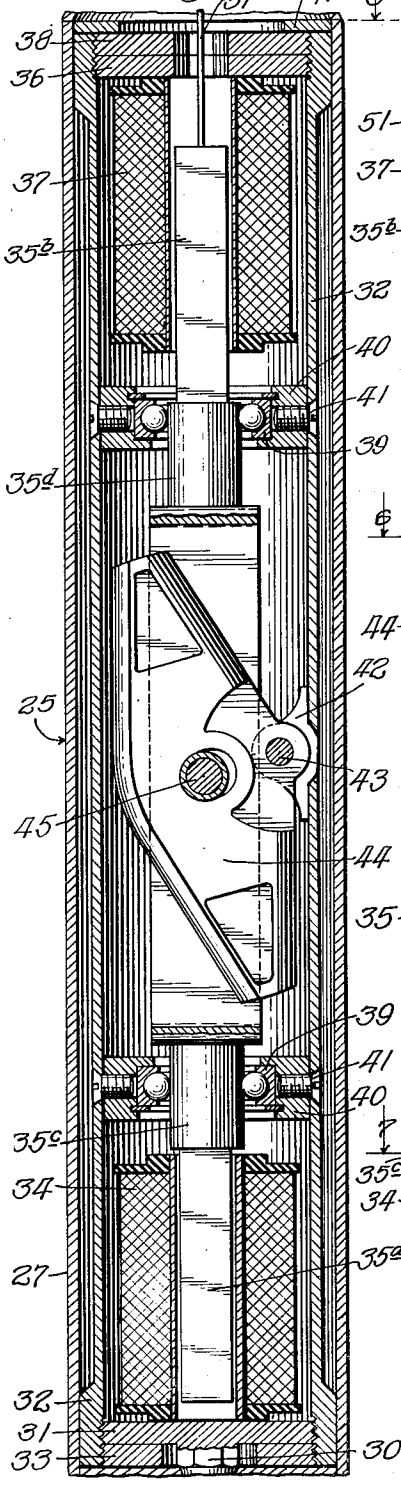


Fig. 4.

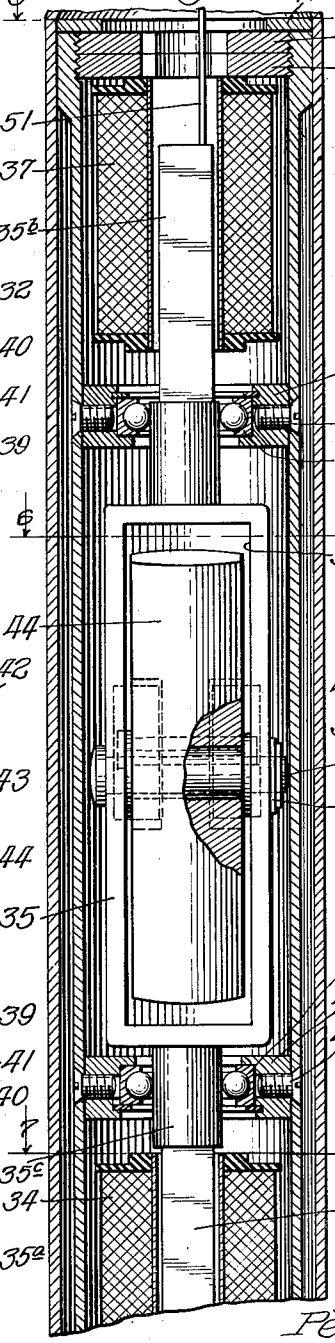


Fig. 5.

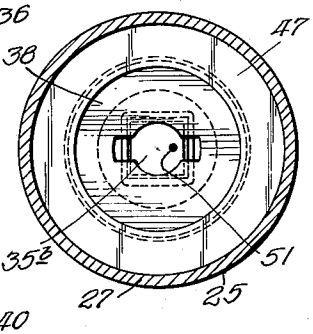


Fig. 6.

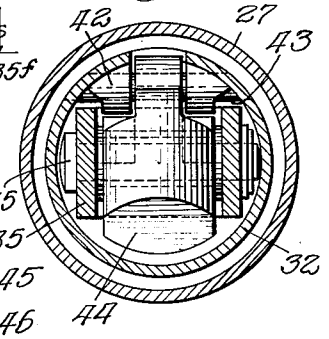
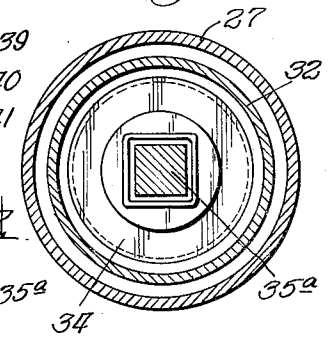


Fig. 7.



Inventors:
Peter F. Connolly,
Charles H. Holmstrom,
By Christy, Schroeder, Morriam & Wolfgram,
Attys.

Aug. 29, 1950 P. F. CONNOLLY ET AL 2,520,833

CONCRETE COMPACTING DEVICE

Filed March 8, 1946 4 Sheets-Sheet 3

Fig. 8.

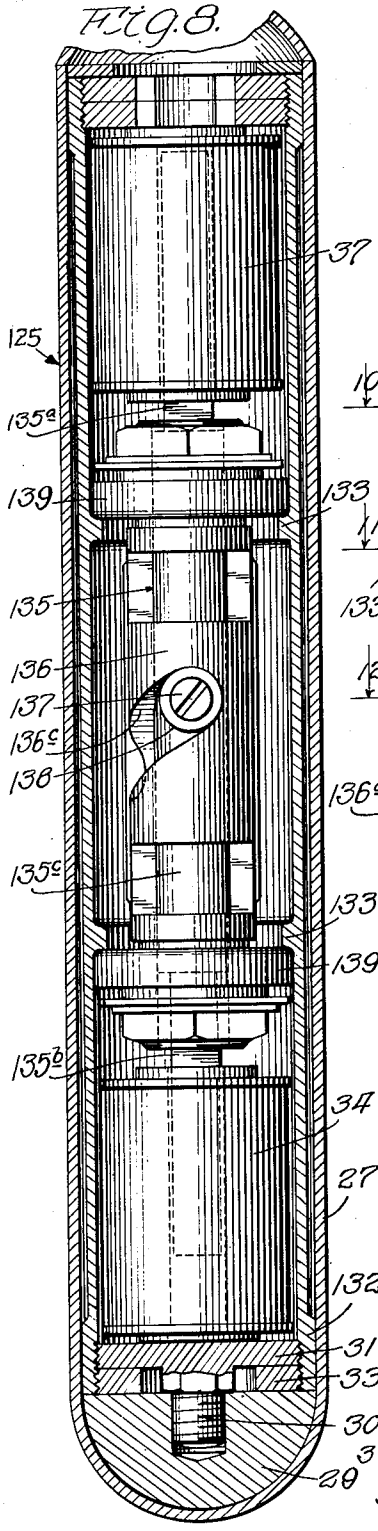


Fig. 9.

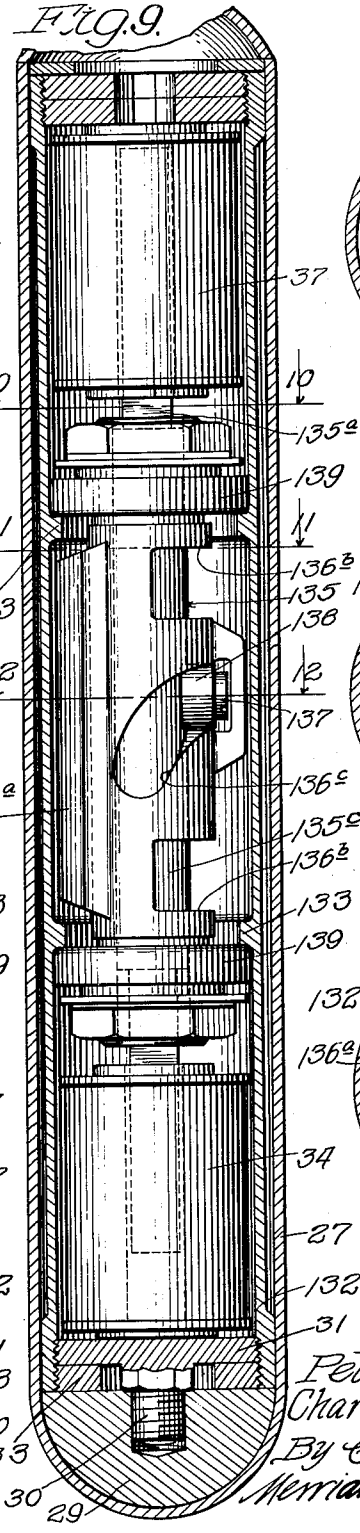


Fig. 10.

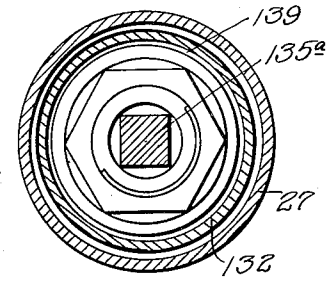


Fig. 11.

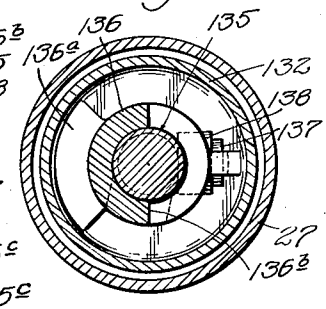
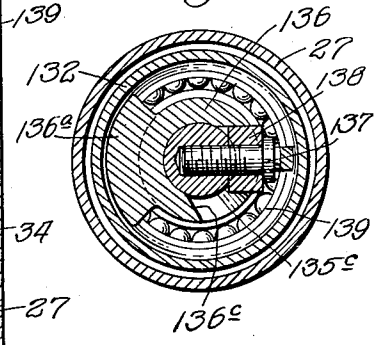


Fig. 12.



Inventors:
Peter F. Connolly,
Charles H. Holmstrom,
By Chittick, Schroeder,
Merriam & Hoffman, Attys.

Aug. 29, 1950 P. F. CONNOLLY ET AL 2,520,833

CONCRETE COMPACTING DEVICE

Filed March 8, 1946 4 Sheets-Sheet 4

Fig. 13.

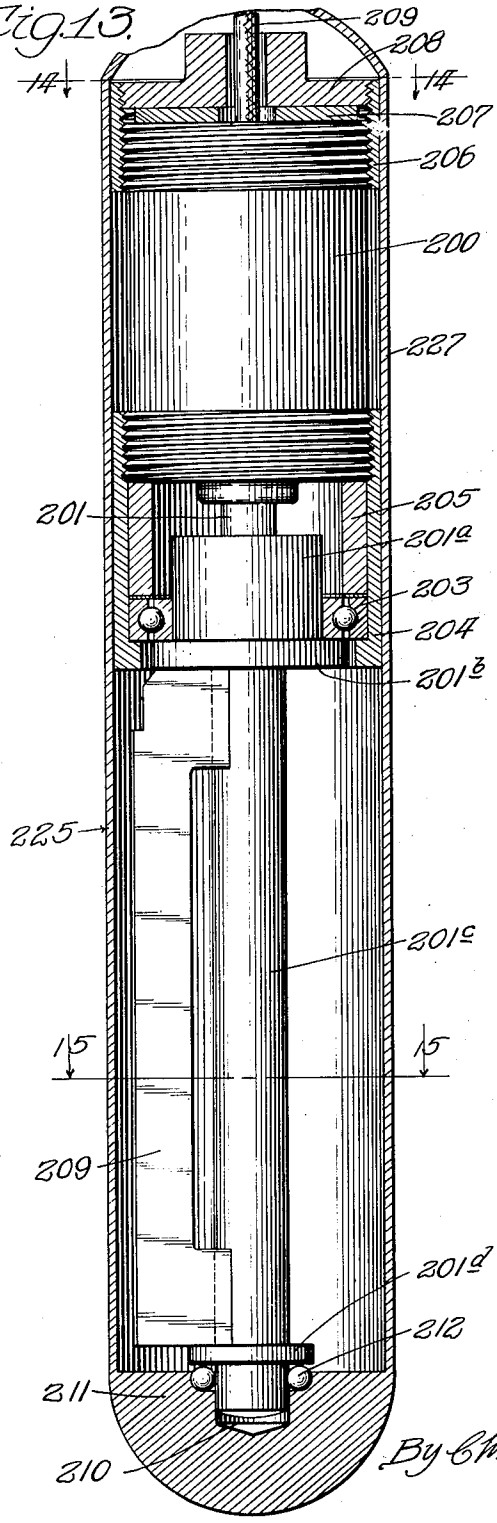


Fig. 14.

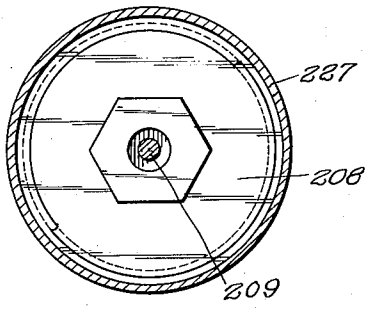
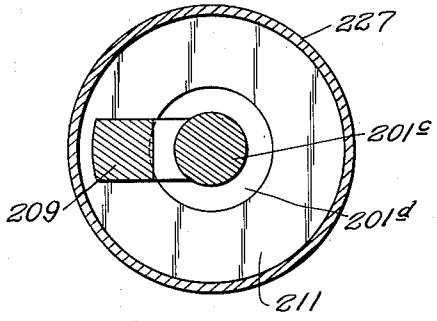


Fig. 15.



Inventors:
Peter F. Connolly,
Charles H. Holmstrom,
By Chrittor, Schroeder, Merriam & Wigren,
Attys.

Patented Aug. 29, 1950 2,520,833

UNITED STATES PATENT OFFICE

2,520,833

CONCRETE COMPACTING DEVICE

Peter F. Connolly, Chicago, Ill., and Charles H. Holmstrom, San Diego, Calif.

Application March 8, 1946, Serial No. 652,866

3 Claims. (Cl. 259—1)

1

The present invention relates to concrete compactors and more particularly to a device for compacting a cement wall.

When cement is poured, it must be carefully and thoroughly compacted or air holes or pockets will form in it around the larger stones and around the structural metal members or reinforcing bars customarily used in such constructions. When the concrete is laid on a flat surface, as in constructing a floor, it is a relatively easy matter to compact the concrete by tamping it after it has been poured. Where the structure is vertical, as in a wall, however, such tamping is not as convenient or effective because the concrete is poured in forms and all tamping must be from above. Preferably the concrete must be tamped after every foot or so has been poured. This results not only in delay but because of the larger amount of structural support members necessary in a wall is not too effective and holes or pockets result. Furthermore, tamping always results in uneven compacting as the side or surface that is tamped is well compacted, but the parts spaced from this side or surface do not get the full force of the tamping action and usually retain some of the air holes or pockets initially formed therein.

An object of the present invention is to compact concrete internally by the insertion of an agitating or vibrating device which will compact the concrete thoroughly and remove all air holes or pockets and which will act quickly so that it may be gradually raised as fast as the concrete is poured, thus eliminating the delays previously encountered.

Another object is to provide a compacting device that is electrically driven so that many compactors may be operated by one person.

Still another object is to provide a compactor that vibrates or agitates sideways from the center of the layer of concrete and hence compacts the concrete uniformly.

Still another object is to provide a compactor that is very long and thin so that it may be inserted and withdrawn between the metal structural members or reinforcing bars.

Another object is to provide a device adapted to compact concrete and thin semi-fluid masses which are poured into forms in planes other than horizontal.

Further objects and advantages will become readily apparent from the following detailed description taken in connection with the accompanying drawings illustrating preferred forms of the invention wherein:

Fig. 1 is a perspective view of a concrete wall under construction and being compacted in accordance with the present invention, but with parts broken away for the purpose of clarity.

2

Fig. 2 is a vertical sectional view of a compactor embodying the invention.

Fig. 2A is a diagrammatic showing of a switch suitable for use in the compactor.

Fig. 3 is an enlarged fragmentary sectional view of the device shown in Fig. 2 and in a plane at right angles to the plane of Fig. 2.

Fig. 4 is a view similar to Fig. 3 but in the same plane as Fig. 2.

Fig. 5 is a sectional view taken on the line 5—5 of Fig. 4.

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 4.

Fig. 7 is a sectional view taken on the line 7—7 of Fig. 4.

Fig. 8 is a vertical sectional view of an alternate form of the compacting device.

Fig. 9 is a sectional view of the device shown in Fig. 8, but in a plane at right angles to the plane of Fig. 8.

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 9.

Fig. 11 is a sectional view taken on the line 11—11 of Fig. 9.

Fig. 12 is a sectional view taken on the line 12—12 of Fig. 9.

Fig. 13 is a vertical sectional view of another alternate construction.

Fig. 14 is a sectional view taken on the line 14—14 of Fig. 13.

Fig. 15 is a sectional view taken on the line 15—15 of Fig. 13.

While we have shown and described certain embodiments of our invention it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims.

In Fig. 1 of the drawings, there is shown a concrete wall shown generally at 20 being constructed in a form comprising a front wall 21 made of a single layer of boards and a similar back wall 22 on which is provided a platform 23 for the workmen. A suitable power line (not shown) supplies electric current to a plurality of leads in cables 24 each of which is connected to a compactor 25. These compactors are suspended by the cables between the walls of the form and as wet concrete 26 is poured into the form are energized to vibrate the wet concrete around them, and thereby compact the concrete by

eliminating all air spaces or pockets formed therein around larger stones in the concrete and around or adjacent the customary structural metal members (not shown) embedded in the concrete. As illustrated, the compactors are embedded in the concrete every few feet and, as the concrete rises or mounts in the forms, are adapted to be gradually raised by the workman to compact higher parts of the wall. The compactors being relatively small in diameter, the concrete will flow into and fill the space formerly occupied by them as they are gradually raised, and they may be readily worked up through any reinforcing rods or the like in the concrete.

Figs. 2–7 of the drawings disclose a preferred form of compactor in which the compactor 25 comprises a long, thin cylindrical casing 27 of metal, plastic, rubber or other suitable material which will not be affected or damaged by the wet concrete. The upper end of the casing is provided with a collar 28 adapted to receive the end of a cable 24. The other end of the casing is filled by a plug 29 suitably secured thereto and having a central threaded opening drilled therein to receive a threaded nut 30 extending from a disk 31 forming the bottom of an inner cylindrical casing 32. The disk 31 is threaded into the casing 32 as shown and a lock washer 33 holds the disk 31 in place.

Secured above the disk 32 is a solenoid 34 having a square central bore into which extends the lower square end 35*a* of a shaft 35. The upper end of the inner casing is also threaded internally to receive a disk 36 under which is secured a solenoid 37, a lock washer 38 holding the disk 36 in place. The solenoid 37 also has a central square bore into which the other end 35*b* of the shaft 35 extends.

The central portion of the shaft 35 is enlarged, and hollowed out to form an opening 35*f*. Between the central section and the square ends 35*a* and 35*b* are sections 35*c* and 35*d* of circular cross section, but of smaller diameter than the central section. Around these sections 35*c* and 35*d* are ball bearings 39 in raceways 40 secured to the inner casing member 32 by means of threaded bolts 41. A pair of brackets 42 are secured to the inner side wall of the casing 32 and are provided with aligned openings in which is mounted a stub shaft 43. A walking beam 44 is pivotally mounted on this shaft and as shown in Fig. 4 extends through the opening 35*f* in the shaft 35.

A bolt 45 also extends through the center of the shaft 35 and through the walking beam 44 and is held in place by a nut 46, the bolt 45 being of less diameter than the openings in the shaft 35 and walking beam 44 through which the bolt extends.

In the upper part of the outer casing 27 and above the washer 38 is a washer 47 on which is mounted a switch 48 connected to a lead 49 from the cable 24. As shown in Fig. 2A, this switch has a spring action blade 50 which extends into an opening in a switch actuating member 51 secured to the top of the shaft section 35*b*. The switch is also provided with two contacts on leads 52 and 53 which are connected to the lower solenoid 34 and the upper solenoid 37 respectively. Wiring (not shown) leads from these solenoids to a return lead in the cable 24.

In operation the solenoids 34 and 37 are alternately energized by the switch 48 and hence raise and lower the shaft 35 causing the heavy walking beam 44 to oscillate back and forth on the pivot 43. The beam being heavy will cause the entire compacting device to vibrate at the end of each movement of the beam. The vibrating movement will be sideways and will affect, or agitate and hence compact, the wet concrete in the area surrounding the device, causing it to flow into all air holes or pockets formed when it was poured.

In the alternate construction shown in Figs. 8–12, the compactor device 125 comprises an outer casing 27 suspended from a cable 24 as in the previous figures and an inner cylindrical casing 132 which is provided with a pair of internal flanges 133. Solenoids 34 and 37 are mounted in each end of the casing as in the previous figures and extending into the bores thereof are the square ends 135*a* and 135*b* of a shaft 135. As shown, this shaft 135 has a circular central section 135*c* connecting the two end sections. Surrounding the shaft section 135*c* is a sleeve member 136 having a heavy extension or projection 136*a* on one side thereof, cut-out portions 136*b* on its opposite side and a slot 136*c* in its central portion. In the slot 136*c* and rotatably mounted on a bolt 137 threaded into the shaft section 135*c* is a roller 138. The sleeve 136 is secured in position in the casing 132 by means of ball bearing assemblies 139 bolted to a reduced end of the sleeve and with their outer race members pressed into the casing 132 and against the flanges 133. The electrical connection is the same as that of Figs. 2–7 inclusive.

The weight of the sleeve, by reason of the projection 136*a* and cut-out portion 136*b* is very much off-center. As the shaft 135 is rapidly reciprocated up and down by the solenoids 34 and 37 it forces the sleeve to oscillate, and the reversal of movement thereof results in rather violent vibration of the entire device in a sidewise direction because of the sleeve's off-center weight. Compacting of the wet concrete as explained above results.

In Figs. 13 to 15, still another compactor device construction 225 is disclosed comprising an outer casing 227 in the upper part of which is mounted a small electric motor 200, the shaft 201 of which is enlarged at 201*a* where it is journaled in ball bearings 203 mounted in a sleeve 204 threaded to the lower end of the casing of the motor and spaced therefrom by a washer 205. A sleeve 206 pressed in the upper end of the housing 27 is threadedly secured to the upper end of the motor which is also held in place by washer 207 and a nut 208 likewise threaded into the sleeve 206. A lead 209 from a cable 24 is connected to the motor.

Below the enlarged section 201*a* the shaft 201 is flanged at 201*b* which also provides a mounting for the movable part of the bearing assembly 203. Below the flange 201*b* the shaft section 201*c* is reduced in size and is provided on one side with a heavy blade 209 to provide an off-center weight. The lower end of the shaft extends into a central opening 210 in the base 211 of the casing 227 where it is journaled in a ball bearing 212 in a groove at the top of the opening 210 and is held in place by a flange 201*d* on the shaft.

As the shaft 201 is rotated by the motor, it vibrates sidewise due to the off-center weight of the blade 209 and an action similar to that of the preceding figures results.

We claim:

1. A concrete compacting device, comprising: a casing adapted to be inserted into wet con-

crete; solenoids in each end of said casing; a member adapted to be reciprocated by said solenoids; and an eccentric driven by said member to vibrate the casing.

2. A concrete compacting device, comprising: a casing adapted to be inserted into wet concrete; solenoids in each end of said casing; means for alternately energizing said solenoids; a member extending into and reciprocated by said solenoids; and an eccentric oscillatably driven by said member to vibrate the casing.

3. An agitator comprising: a generally cylindrical casing having a length at least several times its diameter and adapted to be suspended in the material to be agitated; a pair of solenoids in said casing; means for alternately energizing said solenoids; a member adapted to be oscillated by said solenoids to vibrate said casing in a substantially horizontal direction; and means connecting said member to both of said solenoids.

PETER F. CONNOLLY.
CHARLES H. HOLMSTROM.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,704,025	Wakl	Mar. 5, 1929
1,747,555	Pelton	Feb. 18, 1930
1,784,385	Pelton	Dec. 9, 1930
1,988,316	Jackson	Jan. 15, 1935
2,061,943	Jorgensen	Nov. 24, 1936
2,075,093	Cannon	Mar. 30, 1937
2,118,732	Kruger	May 24, 1938
2,142,273	Jorgensen	Jan. 3, 1939
2,278,839	Douglass	Apr. 7, 1942