July 8, 1941. A. W. MALL 2,248,478

ROLLER VIBRATOR

Filed July 8, 1938 3 Sheets-Sheet 1

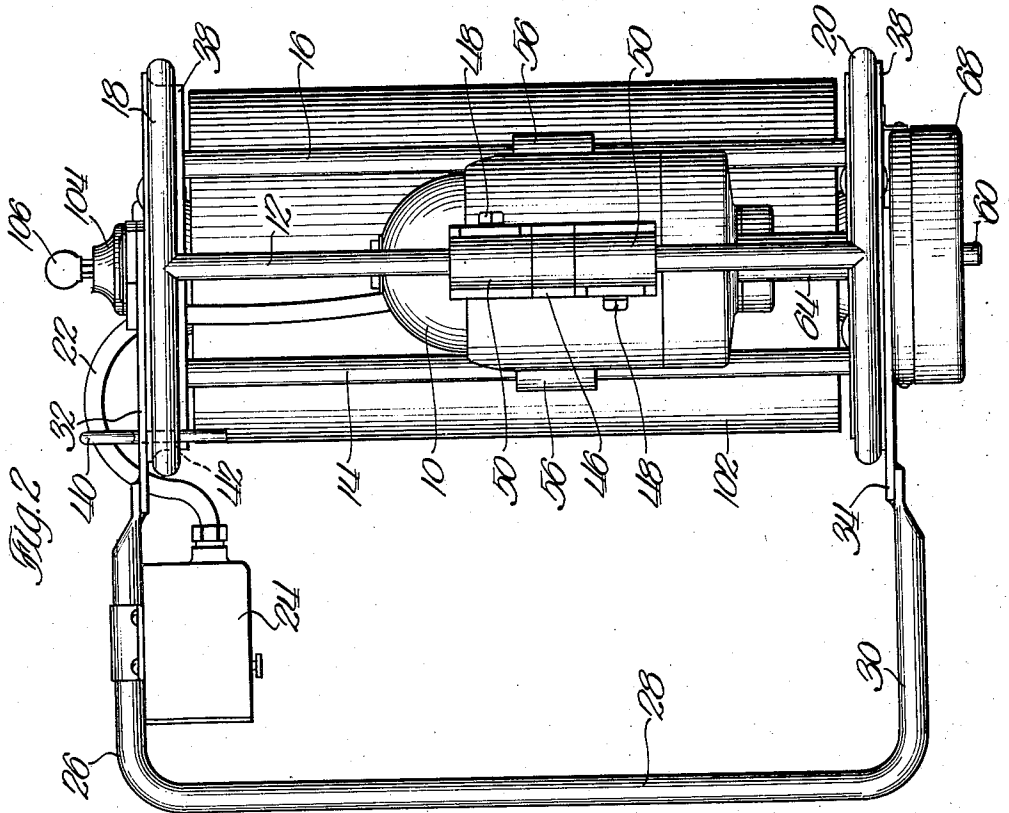

Fig. 2

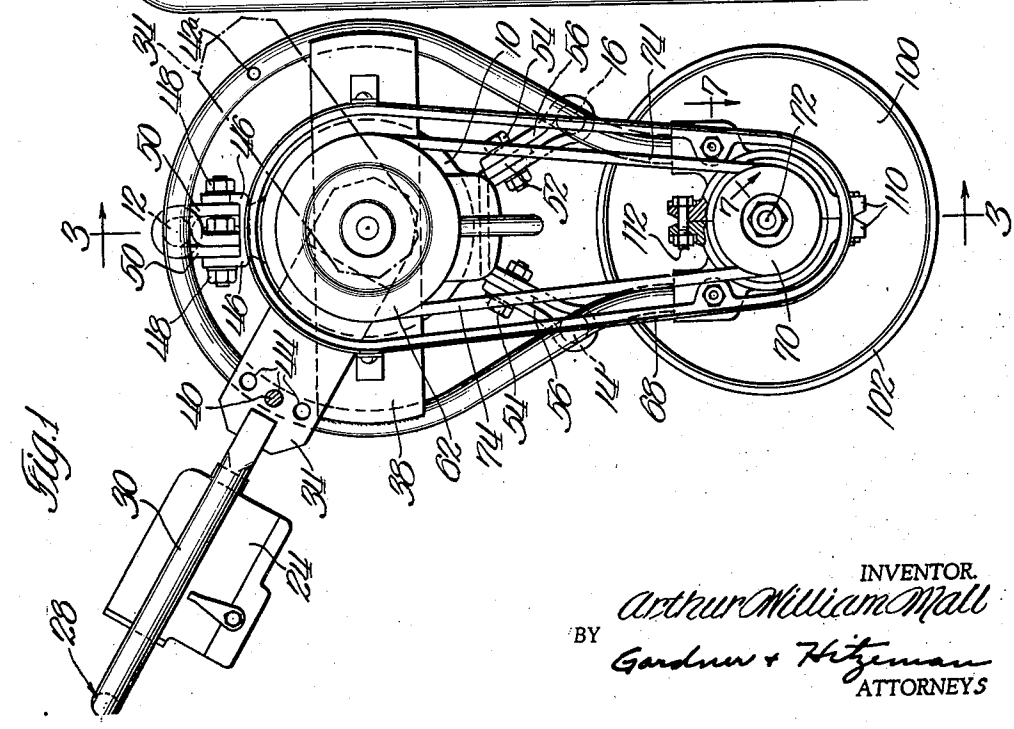

Fig. 1

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ROLLER VIBRATOR

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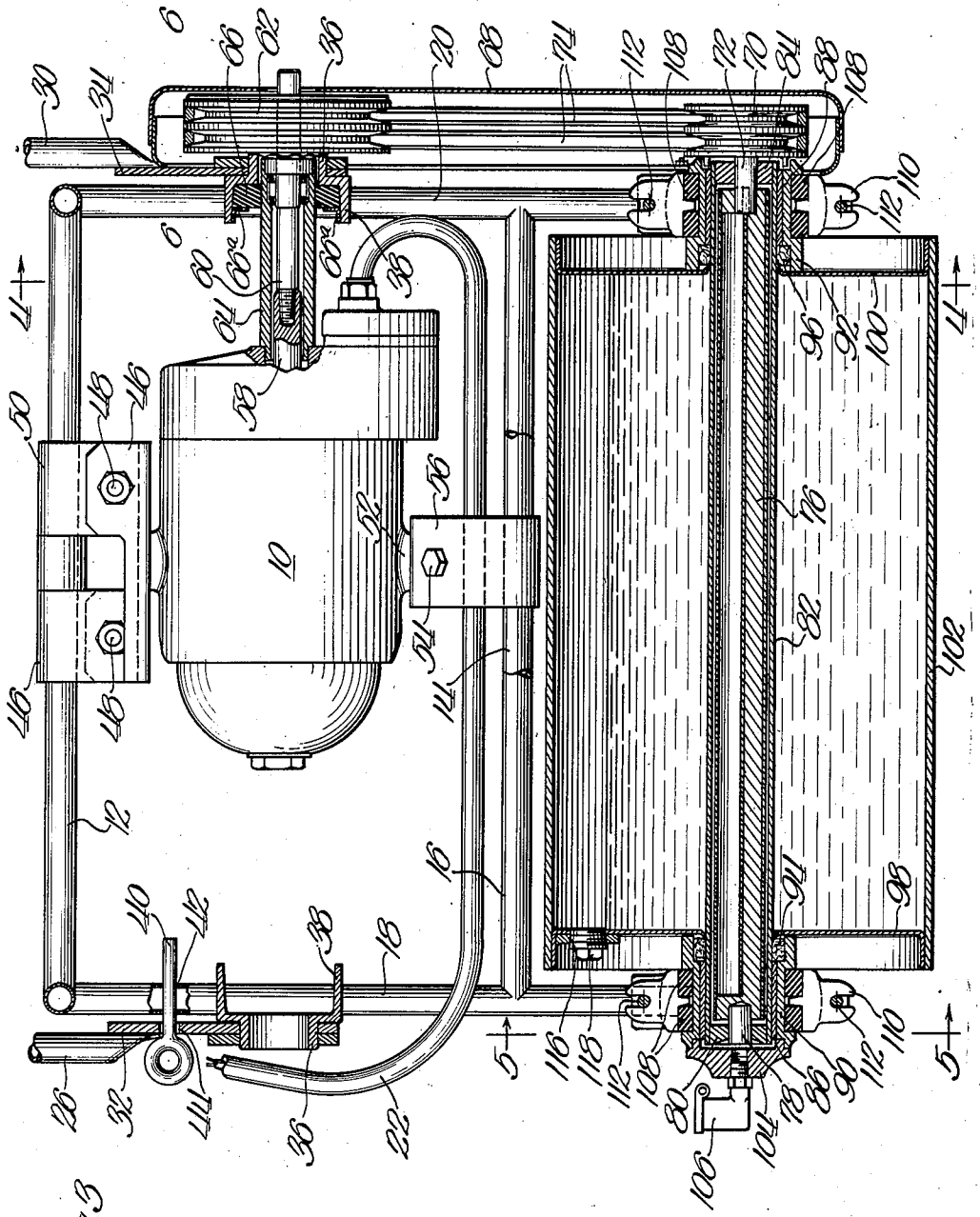

Fig. 3

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ROLLER VIBRATOR

Filed July 8, 1938 3 Sheets-Sheet 3

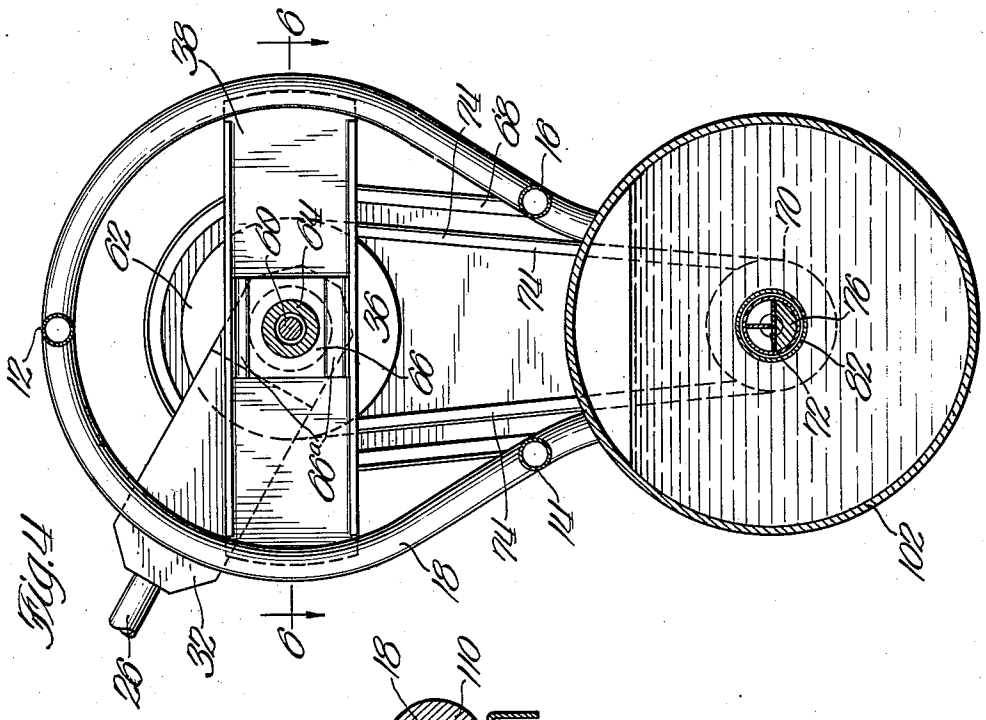

Fig. 4

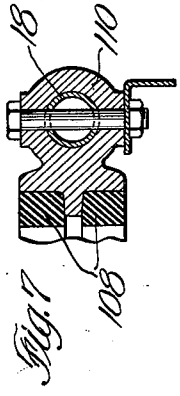

Fig. 7

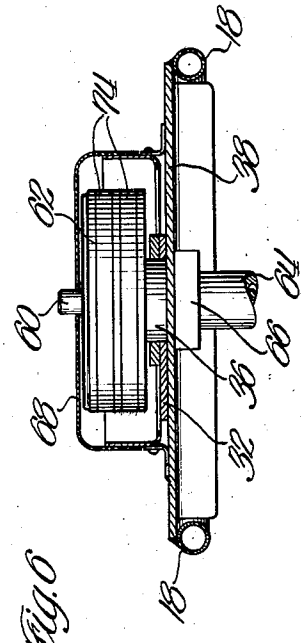

Fig. 6

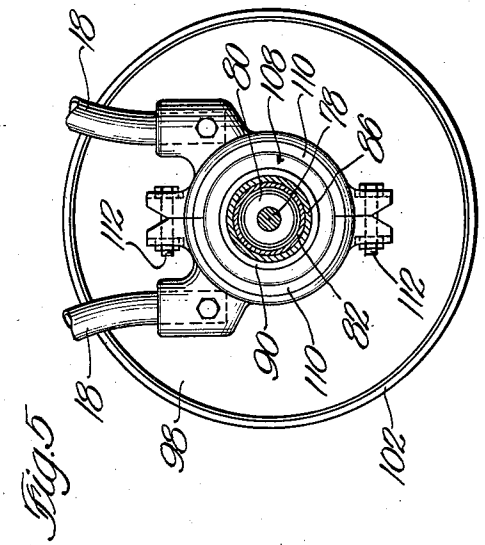

Fig. 5

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Patented July 8, 1941

2,248,478

UNITED STATES PATENT OFFICE

2,248,478

ROLLER VIBRATOR

Arthur William Mall, Chicago, Ill.

Application July 8, 1938, Serial No. 218,241

7 Claims. (Cl. 94—48)

My invention relates to vibrating mechanisms and similar devices.

My invention relates more particularly to surface vibrating devices of the type usually employed on the surface of floors, roads and similar places that are constructed of a semi-plastic or plastic such as unset cement or similar matter.

The principal object of the present invention is to provide a vibrating mechanism of the class described capable of being moved about over the surface of unset concrete or like plastic material on a floor or road that is being built.

A further object of the invention is to provide an improved device of the class described which may be manually operated by a single operator.

A further object of the invention is to provide an improved device of the class described with a cylindrical roller capable of having its weight varied in accordance with the amount of pressure desired to be applied in the vibrating operation.

A further object of the present invention is to provide a device of the class described capable of having a cylindrical roller that is utilized as a vibrating element, which roller may be of any desired cylindrical diameter or of any desired length.

A further object of the invention is to provide an improved motor mounted above the roller so that the motor may be utilized as a weight for the vibrating means and at the same time be supported thereon in a manner to prevent to a great degree the transmission of vibrations from the vibrator to the motor.

A further object of the invention is to provide an improved construction of frame mounting of the swivel handle with the roller so that the handle and motor may be tilted as desired without affecting the efficiency of its operation.

A further object of the invention is to provide a horizontally disposed standard vibrator means axially of an enlarged roller which may be capable of construction to a desired weight.

Other objects and advantages will be more apparent from the following description wherein reference is had to the accompanying three sheets of drawings upon which

Fig. 1 is a side elevational view of my improved roller vibrator;

Fig. 2 is a plan elevational view of the same mechanism shown in Fig. 1;

Fig. 3 is a front elevational view of the same with parts broken away in section to more clearly show other parts;

Fig. 4 is a vertical sectional view of the vibrator roller and other mechanism taken generally on the lines 4—4 of Fig. 3;

Fig. 5 is a similar sectional view showing the manner in which the swivel handles are connected to the vibrator roller, taken generally on the line 5—5 of Fig. 3;

Fig. 6 is a horizontal sectional view taken generally on the line 6—6 of Fig. 3; and

Fig. 7 is a fragmentary sectional view taken generally on the line 7—7 of Fig. 1.

In the embodiment of the invention which I have chosen to illustrate, in Figs. 1 and 2 I have shown a driving motor 10 adapted to be supported upon the three parallel rods 12, 14 and 16 which are connected between the side frame members 18 and 20. The motor 10 may be of the usual type of electric motor suitable for the purpose provided and be connected by a suitable cable 22 with a switch box 24 supported upon one extension 26 of the operating handle 28.

The operating handle 28 has the two extensions 26 and 30 connected by a spot-welding or other suitable fastening means to a pair of plate members 32 and 34 that are journalled upon the hub portions 36 of the cross-brace channel members 38 disposed between the opposite sides of the side frame members 18 and 20. The channel members are spot-welded or otherwise rigidly secured to the side frame members. The handle 28 may be angularly adjusted about the hub 36 and fastened in a desired angular position by means of a pin 40 adapted to pass through an opening 42 in the side frame member 20 and one of the several openings 44 in the plate 34.

The handle 28 may also be swung around to the right (Fig. 1), and by means of the pin 40 which extends through the opening 42a, the unit can be moved around from the opposite side of the roller, the plate 34 being shown in dotted lines in this position in Fig. 1. This is for the purpose of using the roller vibrator in a room where it is desired to vibrate concrete right up into the corner, and it will be apparent that by shifting it around to either side as desired this action is expedited.

The motor 10, as previously mentioned, is supported upon the parallel cross-frame members 12, 14 and 16. A bracket 46, secured to the upper end of the motor, may be connected by suitable bolt members 48 to rubber or other flexible strap members 50 so that the motor is suspended with some flexibility. In a similar manner the bracket 52, fixedly connected to the lower side of the motor, may be connected by bolt members 54 to a pair of rubber strap members 56 fastened about

the cross-frame members 14 and 16. With this construction the motor is suspended from three separated points so that it is more or less removed from any vibration which may be transmitted from the vibrator proper upwardly through the frame member and to the motor.

The motor may be provided with the usual driving shaft 58 which is screw-threadedly connected to a stub shaft 60 that has a V-belt pulley 62 keyed or otherwise secured to its outer end. The construction which I provide may include a shaft housing 64 which extends through the hub 36 in the channel-shaped frame members. A rubber or other resilient collar 66, secured about the housing 64, is provided for the purpose of stabilizing the action of the shaft and preventing vibrations from being transmitted to the motor. The collar 66 may be held in position against the vertical wall of the channels 36 by a pair of anchor clip members 66a. The pulley 62 may be enclosed with a suitable housing 68 which may extend downwardly and enclose a driving pulley 70 secured to one end of a stub shaft 72. A plurality of V-belts 74 form a driving connection between the motor and the stub shaft 72. The stub shaft 72 may be in driving connection with an elongated offset weight 76 which is provided at its opposite end with a stub shaft 78 journalled in a suitable bearing 80 in the end of axle 82. A similar bearing 84 is provided at the pulley end of the offset weight.

The axle 82, which is hollow as shown, may be formed with a pair of bronze bearing collars 86 and 88 which are mounted in the bushing retainers 90 and 92. Felt washer seals 94 and 96 are provided adjacent the vertical walls 98 and 100 of the cylindrical roller 102. A hub cap 104 may be provided at the end of the bushing retainer to enclose the end of the axle 82. A suitable oil receptacle 106 may be secured to the hub cap.

Both of the bushing retainers are adapted to be mounted in rubber cushion rings 108 that are carried by a pair of split clamp members 110 secured to the lower end of the frame members 18 and 20. The clamp members may be secured together by suitable bolts 112 and thus provide a bearing for the roller 102 and axle 82.

With the construction as thus provided it can be seen that when the motor 10 is started by means of shaft 60 and the driving connection through the pulleys to the stub shaft 72, the offset weight 76 will be revolved at a high rate of speed within the hollow axle 82 of the roller 102. This will obviously produce a vibration or a vibratory effect upon the comparatively large roller 102 so that as the same is being manually moved about over unset concrete it will have a tendency to compact and set the concrete with a vibratory action.

It will be observed that the construction provides that the pulley 70 drives only the vibrator member 76 within the hollow axle 82, the axle itself being mounted in suitable journals to permit rolling the entire unit about over the concrete on the roller 102.

The cushion rings 108 which are provided in the insulator clamps 110 effectively absorb any vibrations which may otherwise be transmitted from the roller to the frame of the machine. It will be noted that the roller 102 is hollow and is provided with an inlet 116 and a plug member 118 so that liquid such as water may be placed in the same to provide the desired amount of weight in the roller. Other material may also be placed in the roller, such as sand or any desirable material which is of sufficient weight to produce the desired result.

While I have illustrated and described a specific embodiment of the invention, it will be apparent to those skilled in the art that changes and modifications may be made in the actual details shown, and I do not desire to limit myself in any particular. Rather what I desire to secure and protect by Letters Patent of the United States is:

1. A vibrating apparatus comprising a roller adapted to ride upon a body of material to be vibrated, a frame, a hollow axle extending longitudinally through the roller connecting the same to the frame for rotation relative thereto, a weight journalled eccentrically within said axle, and a motor carried by the frame exteriorly of the roller and operatively connected to said weight at one end of the axle for revolving the same within the axle, whereby to develop vibrations which said roller is adapted to transmit to said body of material.

2. A roller vibrator comprising a frame, power means associated with said frame, a roller adapted to be moved about over the material to be vibrated, a hollow axle extending longitudinally through said roller and rotatably connecting the same to the frame, a tube coaxially disposed within said hollow axle and driven by said power means at one end of the axle, and a weight secured eccentrically within said tube, said tube and said weight being adapted for high speed rotation within said hollow axle, whereby intense vibrations are imparted through the roller to the material being vibrated.

3. A vibrating apparatus comprising a roller adapted to ride upon a body of material to be vibrated, a frame, a hollow axle extending longitudinally through the roller connecting the same to the frame for rotation relative thereto, a weight journalled eccentrically within said axle, a motor carried by the frame exteriorly of the roller, an operative connection between the motor and weight including a drive shaft extending into one end of said hollow axle and adapted to revolve the weight within the axle whereby to develop vibrations which said roller is adapted to transmit to said body of material.

4. A vibrating apparatus for compacting plastic materials comprising a roller adapted to ride upon the body of material to be vibrated, a frame, a hollow axle extending longitudinally through the roller connecting the same to the frame for rotation relative thereto, vibration producing means located within the axle, a motor carried by the frame, and motion transmitting means extending between the motor and one end of the axle and operatively connected with the vibration producing means for actuating the vibration producing means.

5. A vibration producing apparatus comprising a roller adapted to ride upon a body of material to be vibrated, a frame, a hollow axle extending longitudinally through the roller connecting the same to the frame for rotation relative thereto, rotative vibration producing means located within the axle, and a motor carried by the frame exteriorly of the roller and operatively connected to the said vibration producing means at one end of the axle for revolving the same within the axle, whereby to develop vibrations which said roller is adapted to transmit to the said body of material.

6. A vibrating apparatus comprising a roller adapted to ride upon a body of material to be

vibrated, a frame, a hollow axle extending longitudinally through the roller connecting the same to the frame for rotation relative thereto, a weight journalled eccentrically within the axle and extending substantially the entire length thereof, and a motor carried by the frame exteriorly of the roller and operatively connected to said weight at one end of the axle for revolving the same within the axle, whereby to develop vibrations which said roller is adapted to transmit to said body of material.

7. A vibrating apparatus comprising a roller adapted to ride upon a body of material to be vibrated, a frame, power means carried by the frame, a hollow axle extending longitudinally through the roller and rotatably connecting the same to the frame, a tube coaxially disposed within said hollow axle, and driven by said power means at one end of the axle, and a weight secured eccentrically within said tube and extending substantially the entire length thereof, said tube and weight being adapted for high speed rotation within said hollow axle, whereby vibrations are transmitted through the roller to the material being vibrated.

ARTHUR WILLIAM MALL.