

July 30, 1940.

A. W. MALL

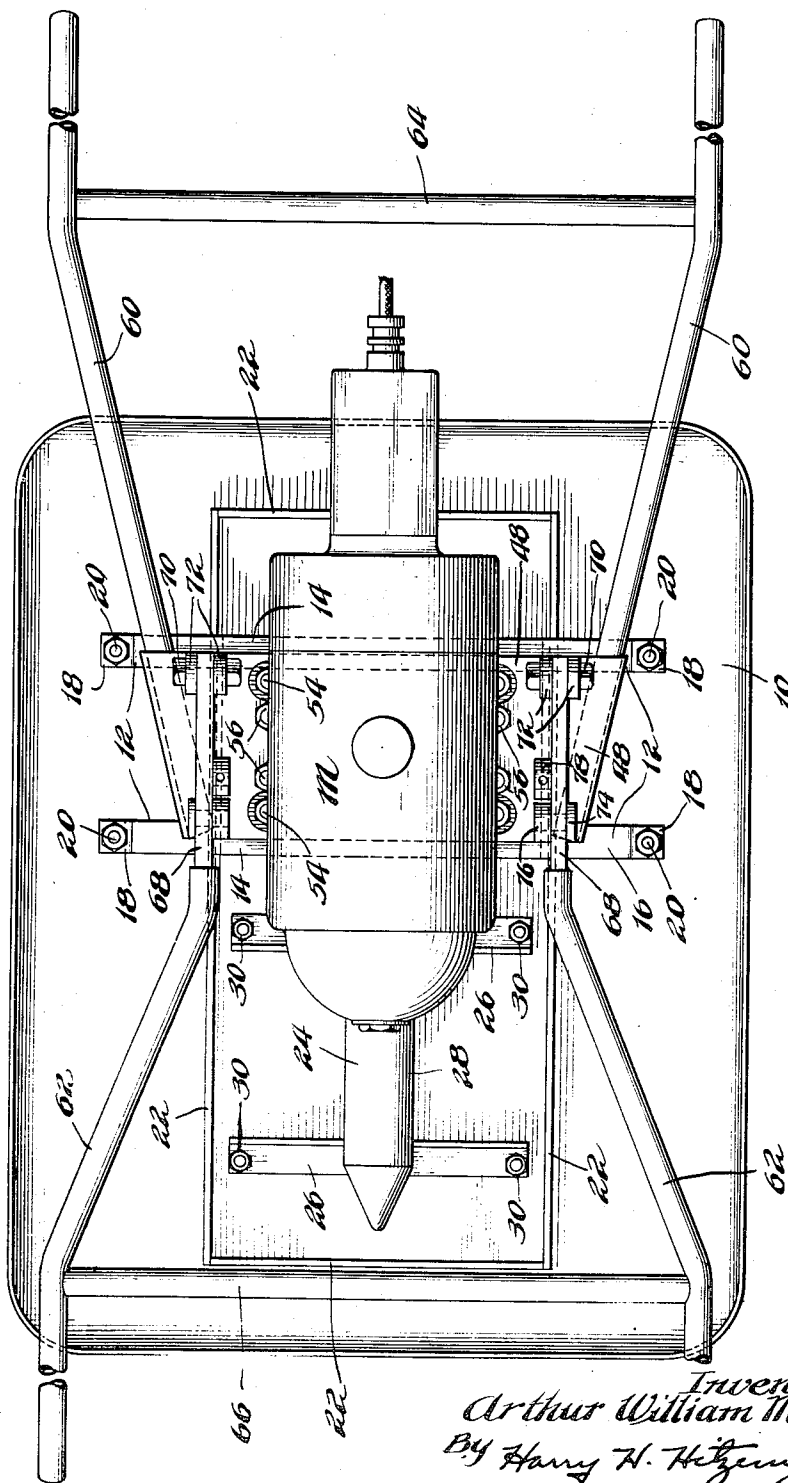
2,209,656

VIBRATOR

Filed May 19, 1937

7 Sheets-Sheet 1

Fig. 1.



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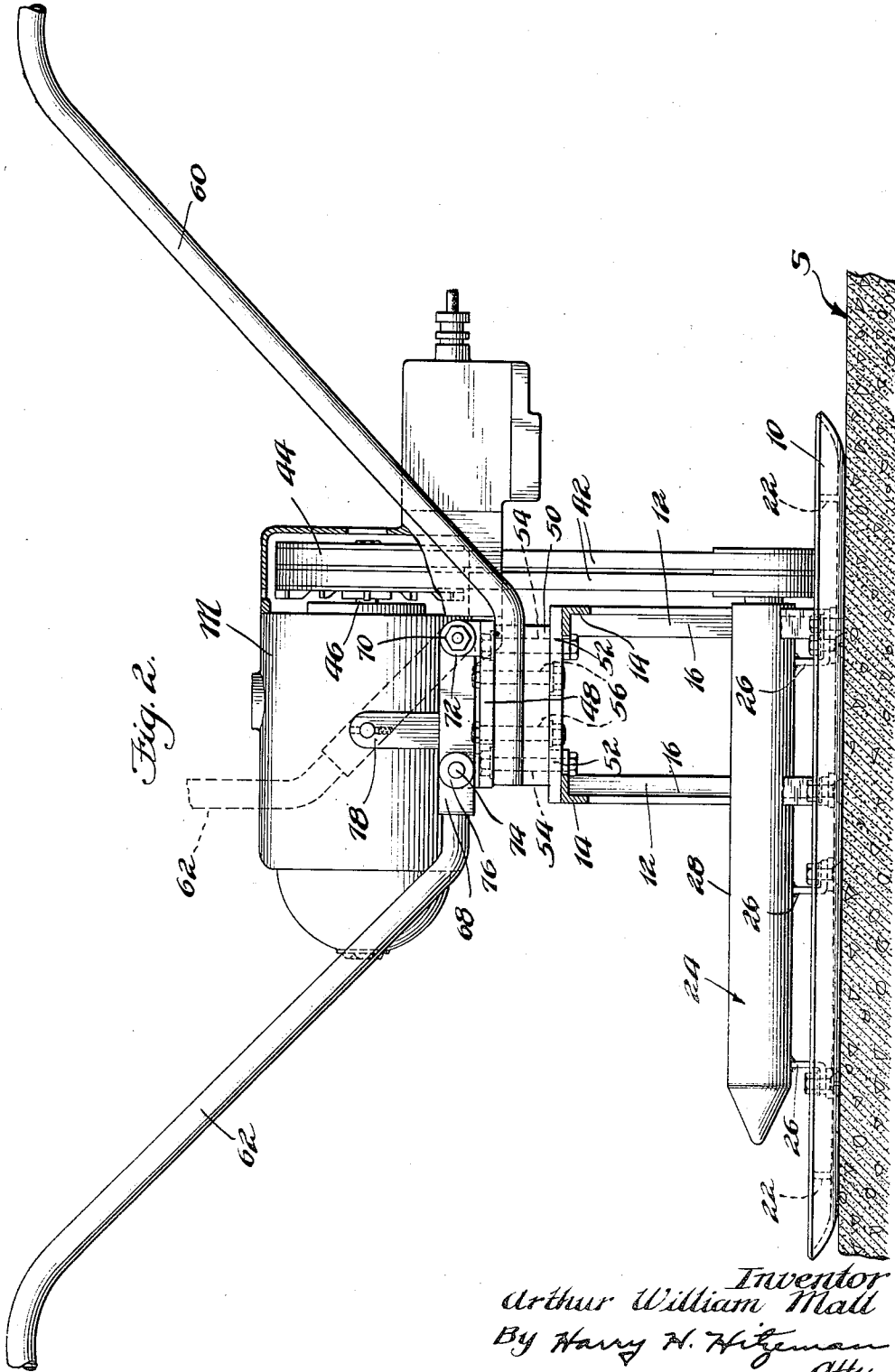
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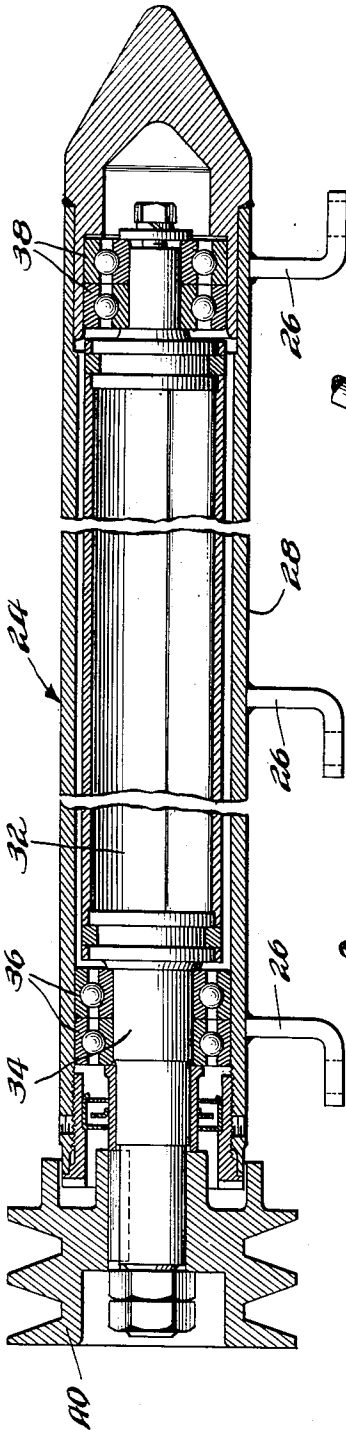


Fig. 4.

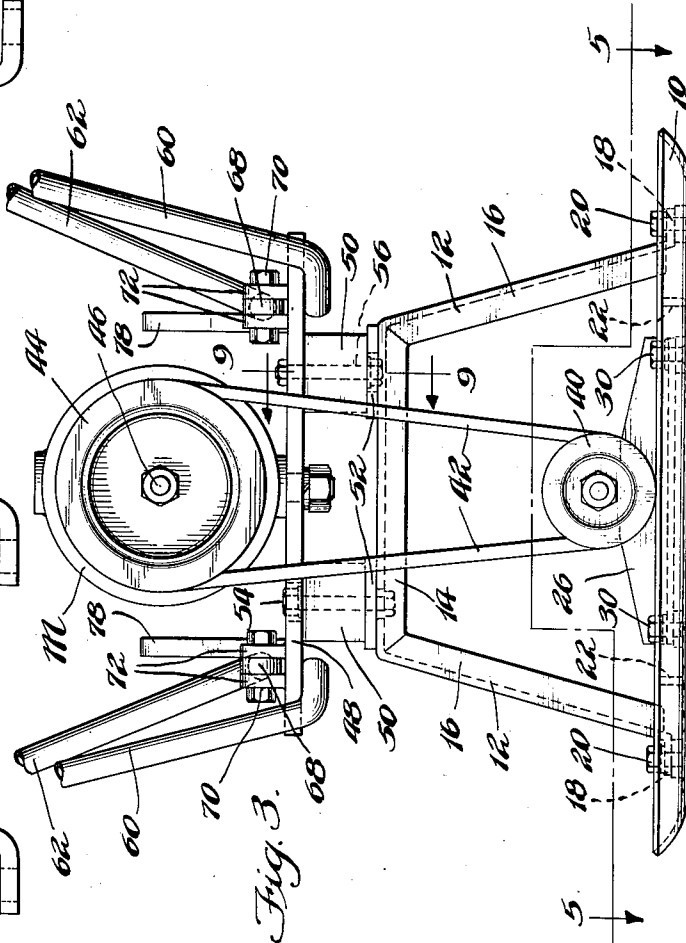


Fig. 3.

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Fig. 5.

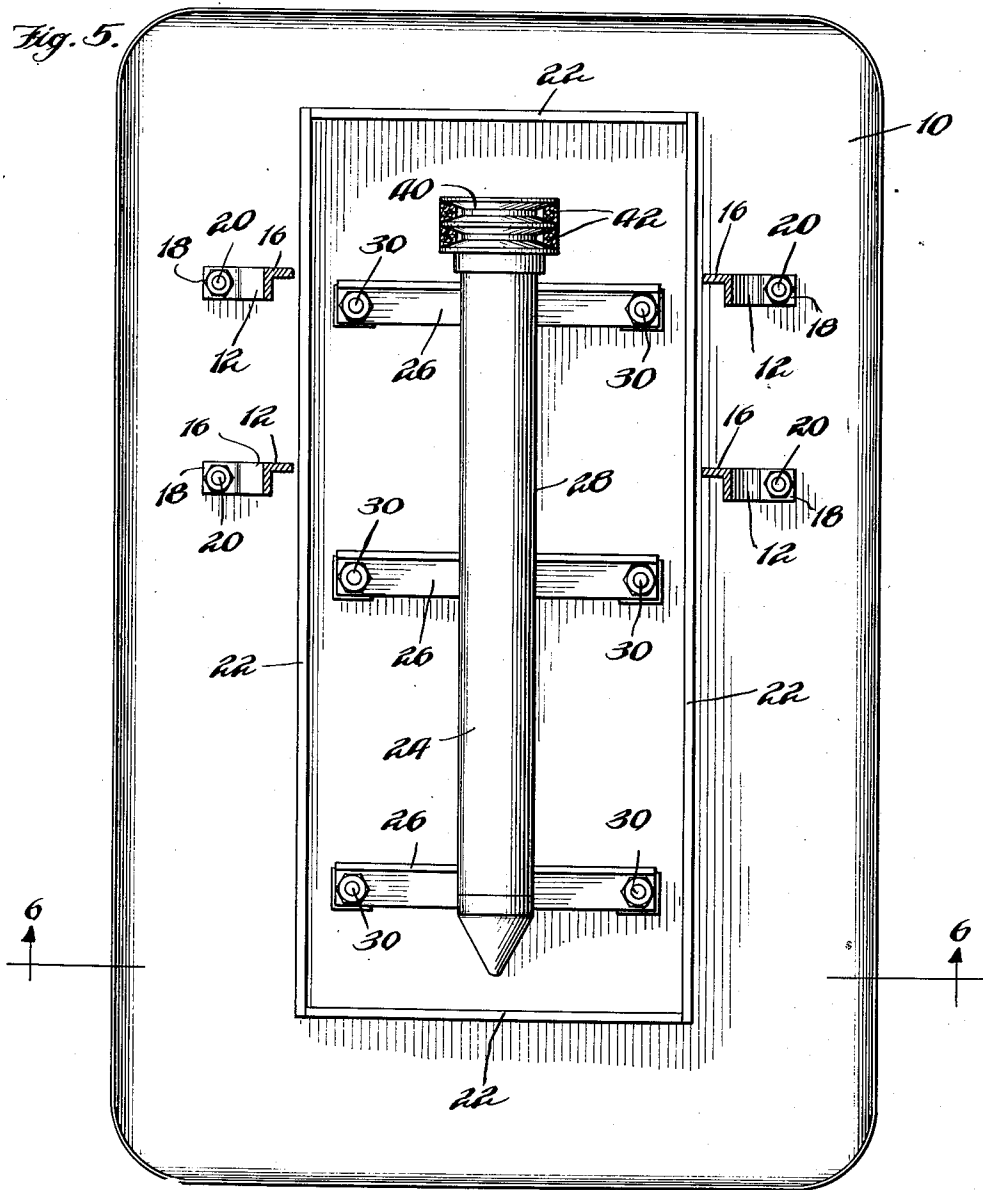
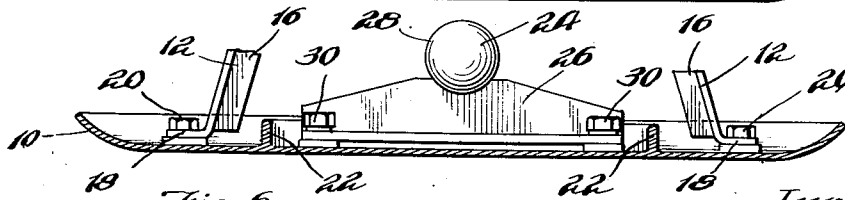


Fig. 6.

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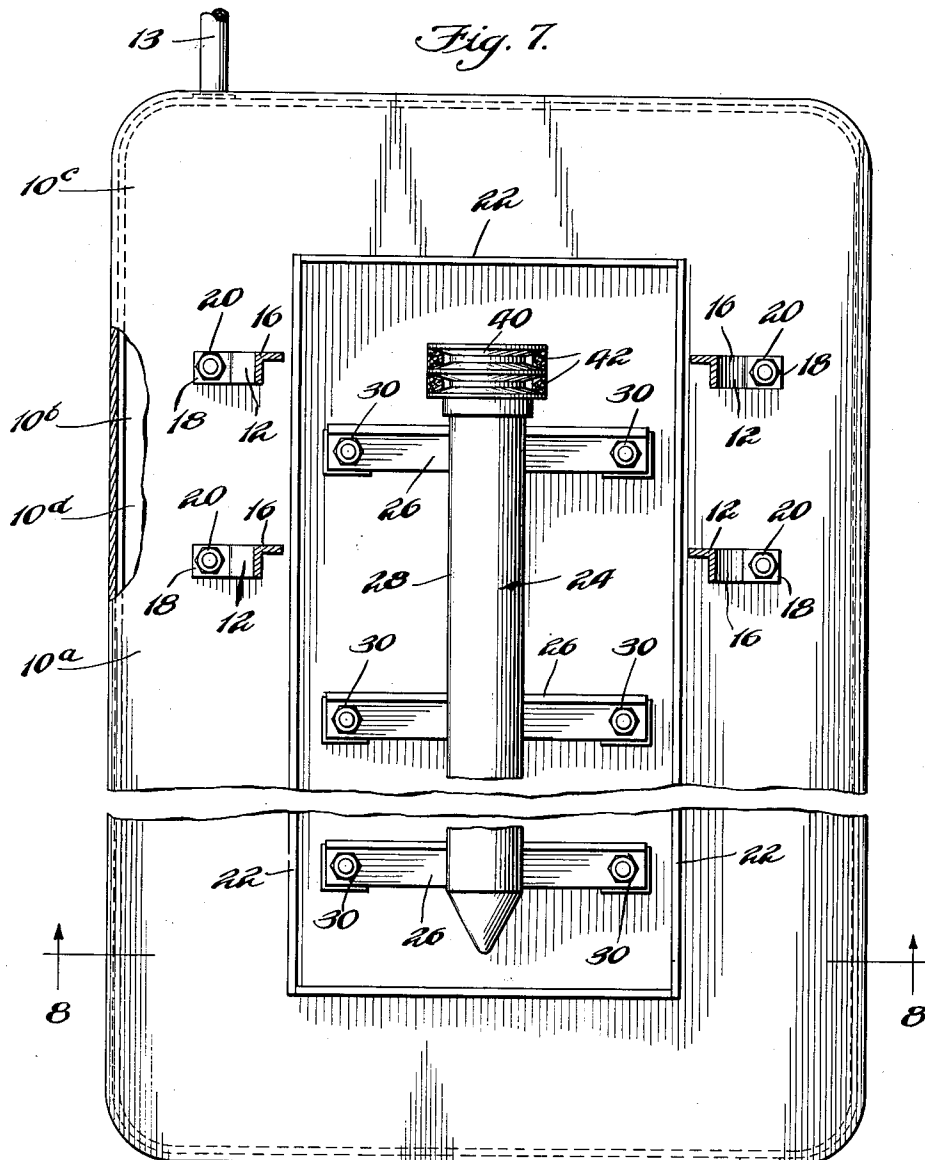
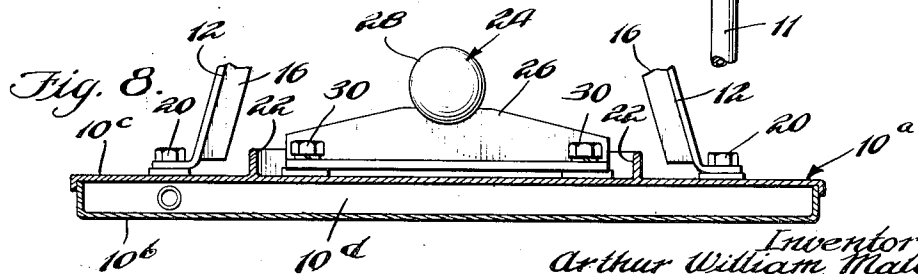
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Fig. 9.

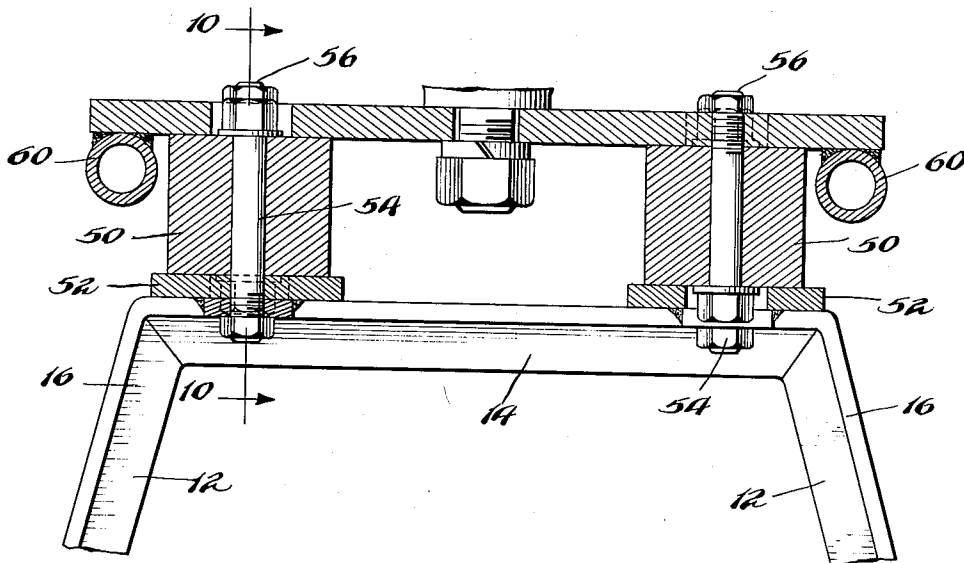
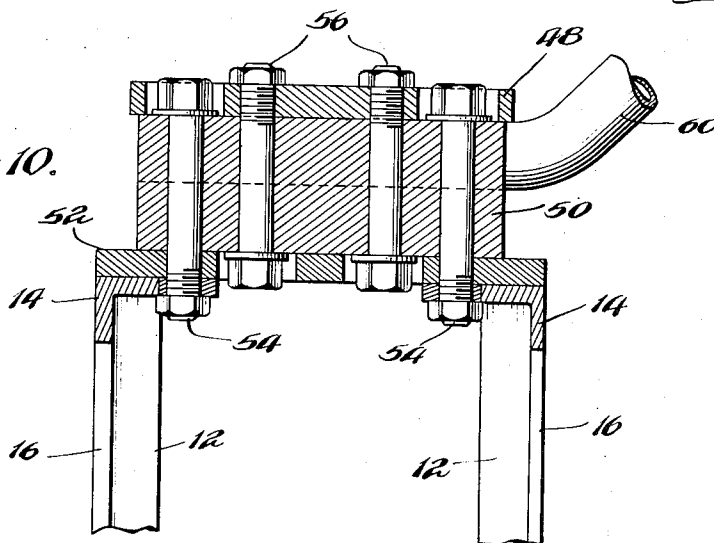


Fig. 10.



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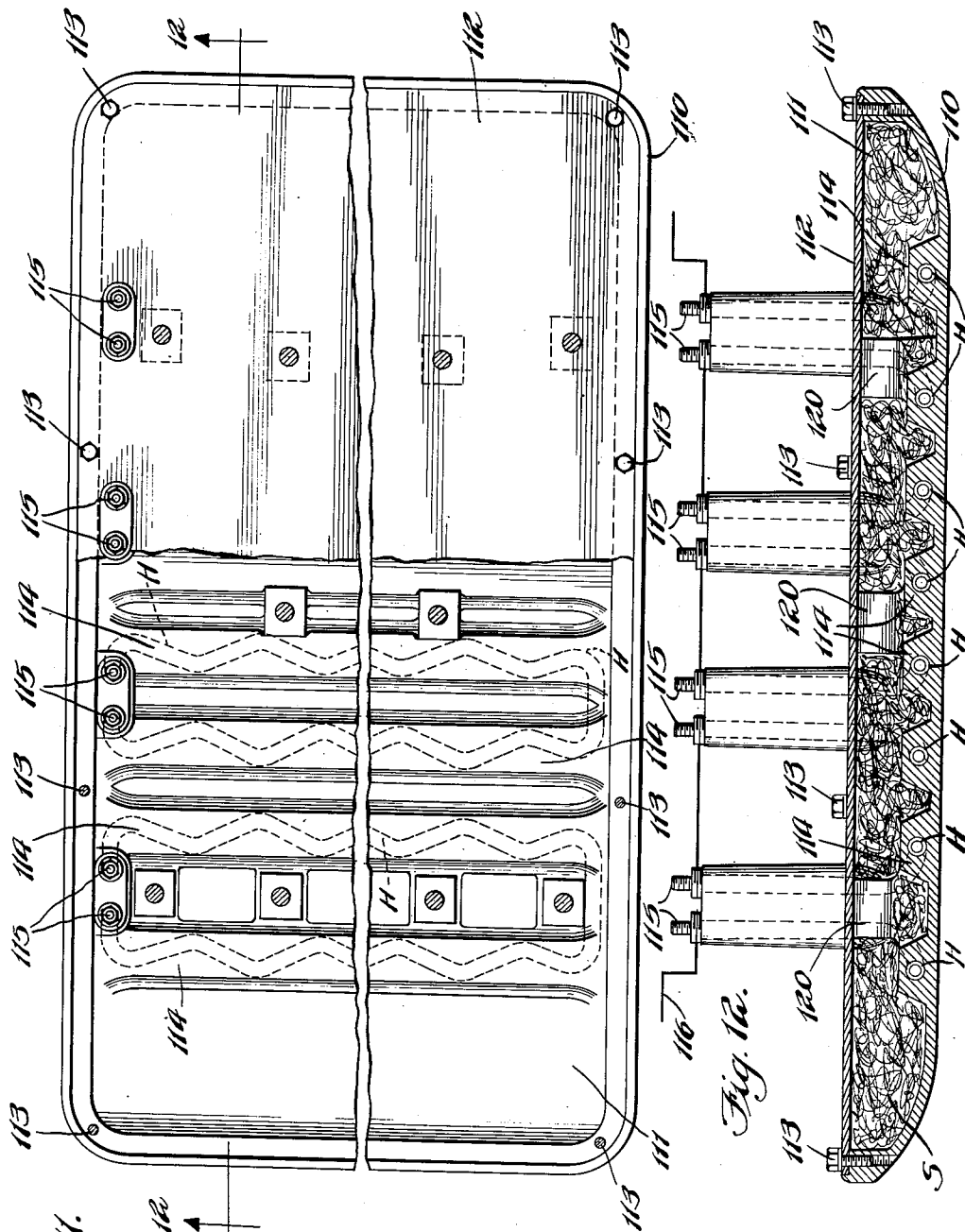


Fig. 11.

Fig. 12.

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UNITED STATES PATENT OFFICE

2,209,656

VIBRATOR

Arthur William Mall, Chicago, Ill.

Application May 19, 1937, Serial No. 143,494

4 Claims. (Cl. 94—48)

My invention relates to apparatus for treating concrete and like plastic materials.

My invention relates more particularly to apparatus for treating concrete and like materials in walls, dams, and various other structures which are usually of comparatively large size and wherein it is desired to compact the surface or bed of the same.

The principal object of my invention is to provide improved apparatus for tamping concrete in walls, dams, and other structures, and especially where tamping on the top surface of the same is highly desirable.

A further object of my invention is to provide improved mechanism of the type described capable of easily and quickly tamping or compacting concrete and like materials poured into forms such as walls, dams and similar structures, where it is desirable to have a perfectly compacted mass and one which has an even upper surface.

A further object of the present invention is to provide an improved apparatus for surface tamping of the type described.

A further object of the present invention is to provide an improved apparatus of the type described that is easily and simply handled by one or more operators, one that is capable of being moved about with ease, and very effective in operation.

A further object of my invention is to provide a tamping or vibrating apparatus of the class described wherein the motor is mounted integral with the tamping or vibrating device, yet so positioned that the vibrations will not be transmitted to the motor.

A further object of the present invention is to provide a device of this type that is rigid in construction, effective in operation, yet not easily capable of becoming out of order.

A further object of the present invention is to provide a modified form of the device wherein the base member adapted to rest upon the surface of the material to be tamped is capable of being heated to operate to melt the material being tamped.

A further object of the invention is to provide an improved tamping or vibrating apparatus of the class described having a heated base member adapted to be placed upon the surface of the material to be tamped and capable of being heated by a connection with a heating means remotely positioned.

Other objects and advantages will be more apparent from the following description wherein

reference is had to the accompanying seven sheets of drawings upon which

Fig. 1 is a plan view of my improved device;

Fig. 2 is a side elevation with one set of handles shown in dotted lines in a changed position;

Fig. 3 is a front elevational view illustrating the manner in which the motor is mounted upon the tamping or vibrating device;

Fig. 4 is a longitudinal cross-sectional view through the vibrator or tamping element;

Fig. 5 is a plan sectional view taken generally on the lines 5—5 of Fig. 3 illustrating the tamping device and the base member;

Fig. 6 is a cross-sectional view of the base member and associated parts and is taken generally on the lines 6—6 of Fig. 5;

Fig. 7 is a plan view of a modified form of base capable of being heated by a liquid connected to a remote heating means;

Fig. 8 is a cross-sectional view through the same taken generally on the lines 8—8 of Fig. 7;

Fig. 9 is a fragmentary sectional view taken generally on the lines 9—9 of Fig. 3, illustrating the resilient motor mounting;

Fig. 10 is a longitudinal sectional view of the same parts taken generally on the line 10—10 of Fig. 9;

Fig. 11 is a plan view of a further modified form of base capable of being heated by electrical units; and

Fig. 12 is a cross-sectional view through the same taken generally on the lines 12—12 of Fig. 11.

The invention may be generally described as a compacting or tamping apparatus comprising a base with its underside of substantial area adapted to rest upon the surface to be treated; and an inertia weight of substantial mass movably mounted upon said base capable of being thrust or vibrated relatively toward and from the base as with an up and down component, thereby causing compacting vibrations or impulses to the base. A load or mass of substantial weight is arranged in a non-rigid relation to the base, preferably above the vibrator proper, whereby its weight is used as a supplemental gravity load or pressure upon the base, yet without adding or imposing substantial resistance to the vibration of the base. The resilient or non-rigid connection of the free or floating load to the base gives the effect that the total depression weight of the apparatus is effectively far greater than the portion thereof required to be vibrated by the motor to produce the compacting action, so that both of these advantageous actions, depression and vi-

bration, are afforded to the utmost efficiency without any mutual conflict.

Referring to the illustrated embodiment of my invention, I have shown a base 10 of generally rectangular shape, adapted to rest upon the surface S of a mass of concrete which it is desired to compact and form with a smooth, even, upper surface. I provide upon the base a motor stand 12 formed with the upper cross bar 14 and the diverging leg portions 16. The lower ends of the leg portions are formed with outwardly turned bosses 18 resting upon suitable pads upon the base 10 and rigidly secured thereto by the bolt members 20. The base 10 is further provided with the strengthening ribs 22 forming a rectangular area bounded thereby. These ribs are adapted to be rigidly secured to the base by spot welding or other suitable means.

The vibrator element 24 is adapted to be rigidly secured upon the upper surface of the base by a plurality of bracket members 26 secured to the outer casing 28 of the vibrator by welding or otherwise, and fastened to the upper surface of the base 10 by a plurality of bolt members 30. The vibrator, which is generally similar to that shown and described in my co-pending application, Serial Number 18,269, filed April 25, 1935, will not be described in detail. Generally it consists of an offset weight member 32 connected to a shaft member 34 that is mounted in a pair of suitable ball bearing members 36 and 38 in the opposite ends of the vibrator housing 28. The shaft 34 may extend beyond one end of the housing 28 and have a pulley 40 for a pair of V-belts 42 secured thereto.

The V-belts 42 may extend upwardly and be in driving engagement with a pulley 44 secured on the end of a shaft 46 extending from the motor M. The motor M may be of any suitable or desirable type capable of driving the vibrator 24 at a desired speed. The motor is preferably secured to a mounting plate 48 positioned upon a pair of resilient block members 50. The block members 50 are mounted upon a pair of plates 52, spot welded or otherwise secured upon the top cross member 14 of the motor stands 12. In order to obtain a resilient mounting between the motor stand and the motor, I provide the pairs of bolt members 54 and 56, the bolt members 54 rigidly connecting the plates 52 and the supports 50, and the bolt members 56 rigidly connecting the support members 50 and the mounting plate 48. In this manner it can be seen that any vibration caused by the action of the vibrator 24 will not be transmitted to the motor, thus saving wear and tear on the same and providing the comparatively steady depressing weight desired to effect efficient tamping.

In order to move the vibrator about over the surface of the mass to be compacted, I provide the pairs of handles 60 and 62. The handles 60 may be connected adjacent their outer end by a cross bar 64 and be secured by spot welding or otherwise at their lower end below the mounting plate 48. The handles 62 may be connected adjacent their outer end by a cross bar 66 and be formed with flat extensions 68 at their inner ends. The ends of the extension 68 are adapted to be pivotally mounted on cross bolts 70 and positioned between ear members 72 mounted upon the plate 48. When it is desired to have the handle member 62 in the position shown in Fig. 1 of the drawings, a pin member 74 may be extended through an ear portion 76 upon the mounting plate 48 and the handle 62 are thus

rigidly held in position. When, however, it is desired to move the compacting base member 60 adjacent a vertical wall, the pins 74 may be withdrawn and extended through a suitable opening in the upright ears 78, thus holding the handle members 62 in the dotted line position shown in Fig. 2.

It is sometimes desirable to use my improved vibrator and compactor upon material such as asphalt or other bituminous products wherein it is desired to heat the surface at the same time it is being compacted in order to secure a more level and uniform surface. Accordingly, in Figs. 7 and 8 I have illustrated a modified form of my invention wherein I provide a base 10a of generally rectangular shape. This base member may be formed with a pan 10b and an upper or cover portion 10c forming in substance a hollow base member. I provide a remotely positioned source of heated fluid, such as hot oil for example, and conduct the same through a flexible conduit to an inlet pipe 11 extending into the chamber 10d at the open end thereof, and a discharge pipe 13 extending back to the source of hot oil supply. The pipe 13 may be connected to the chamber 10d through an opposite wall of the base member 10a so that there will be a circulation of oil over the entire bottom surface of the base before it is returned to the source of supply. With this construction it will be evident that the base member may be effectively heated to assist materially in ironing out rough surfaces upon bituminous or other asphalt or similar products. This construction is especially adaptable for use upon pavements, wharves and other places where asphalt and similar products are used for wearing surface.

While I have described a method whereby hot oil or similar fluid is used for heating purposes in the chamber 10d, it will be obvious that other means may be employed. For example, electric heaters may be located within the chamber 10d or other units capable of producing heat of a desired temperature.

Another modified form of my invention is illustrated in Figs. 11 and 12. In this embodiment I have provided a base 110 of generally rectangular shape. This base member may be provided with a pan 111 forming in substance a hollow base member. A flat, generally rectangular cover plate 112 is provided for the same, secured in position by a plurality of bolt members 113. In the base member above mentioned, I provide a plurality of heating units H, adapted to be cast integral with the base in suitable bosses 114. The heating units may be connected at their ends to suitable terminal members 115 which are positioned adjacent one edge of the base member. A source of current may be provided for the heating units through the electrical conduit 116 which may connect all of the terminals of the electrodes in parallel, or they may be connected together in any desired arrangement to utilize one or more of the electrodes.

I have provided suitable heat insulator spacers 120 positioned at various locations between the cover 112 and the base 110 to generally insulate the cover 112 and its associated parts from the heat. I also provide a filler of steel wool S for the interior of the base below the plate 112 both as a heat reservoir and to provide space for the dissemination of the heat from the electrodes.

From the above description it will be apparent that a highly advantageous construction has been

provided whereby it is not necessary to secure heat from a remote position such as, for example, by means of the construction shown in Figs. 7 and 8. It will further be apparent that other arrangements can be made for heating the base member and I contemplate that the same will be amply protected by the present application.

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

I claim:

1. A vibratory member comprising a flat hollow rectangularly-shaped base member, means for conducting heated fluid to and circulating it through said hollow base member, a vibrator member mounted upon the top wall of said base member, said vibrator member including a cylindrical shell, a rotatable member therein having an offset weight thereon, said rotatable member having a pulley secured to one end thereof, means for driving said member comprising a motor horizontally mounted upon said base above said vibrator member, a shaft in said motor, a pulley secured to one end thereof directly above said vibrator member pulley, a V-belt connecting said pulleys and oppositely extending handle members secured to the sides of said motor, said motor adapted to be resiliently mounted upon said base member thereby providing a depressing weight and non-interference with the vibratory movement of said base member.

2. A vibratory member comprising a flat, rec-

tangularly-shaped hollow base member, a source of heated liquid connected to said base member, a vibrator member mounted thereon, said vibrator member including a cylindrical shell, a rotatable member therein having an offset weight thereon, and means for driving said rotatable member comprising a motor horizontally mounted upon said base and resiliently connected thereto whereby said motor acts as a depressing member, and heating means associated with said base.

3. A vibratory member comprising a flat, rectangularly-shaped hollow base member, a source of heated liquid connected to said base member, a vibrator member mounted thereon, said vibrator member including a cylindrical shell, a rotatable member therein having an offset weight thereon, means for driving said rotatable member comprising a motor horizontally mounted upon said base and resiliently connected thereto whereby said motor acts as a depressing member, and heating means associated with said base, said heating means including electrical heating units cast integral with said base.

4. A vibratory member comprising a flat, rectangularly-shaped hollow base member, a source of heated liquid connected to said base member, a vibrator member mounted thereon, said vibrator member including a cylindrical shell, a rotatable member therein having an offset weight thereon, means for driving said rotatable member comprising a motor horizontally mounted upon said base and resiliently connected thereto whereby said motor acts as a depressing member, and heating means associated with said base, said heating means inclosed in a chamber in said base.

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