

April 21, 1936.

D. G. CLIFFORD

2,038,416

MACHINE FOR LEVELING AND COMPACTING FLOOR COVERING

Filed July 30, 1931

3 Sheets-Sheet 1

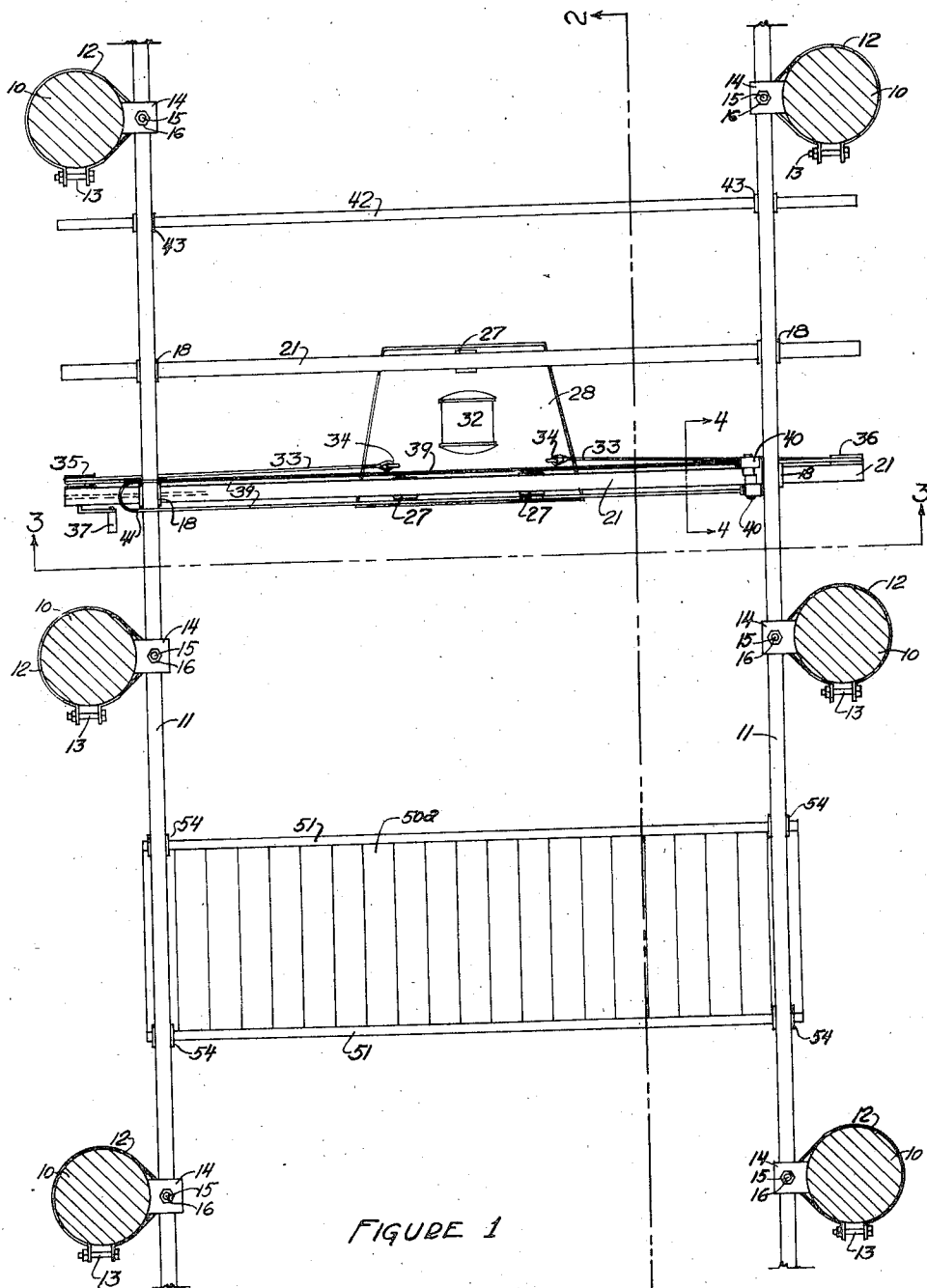


FIGURE 1

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3 Sheets-Sheet 2

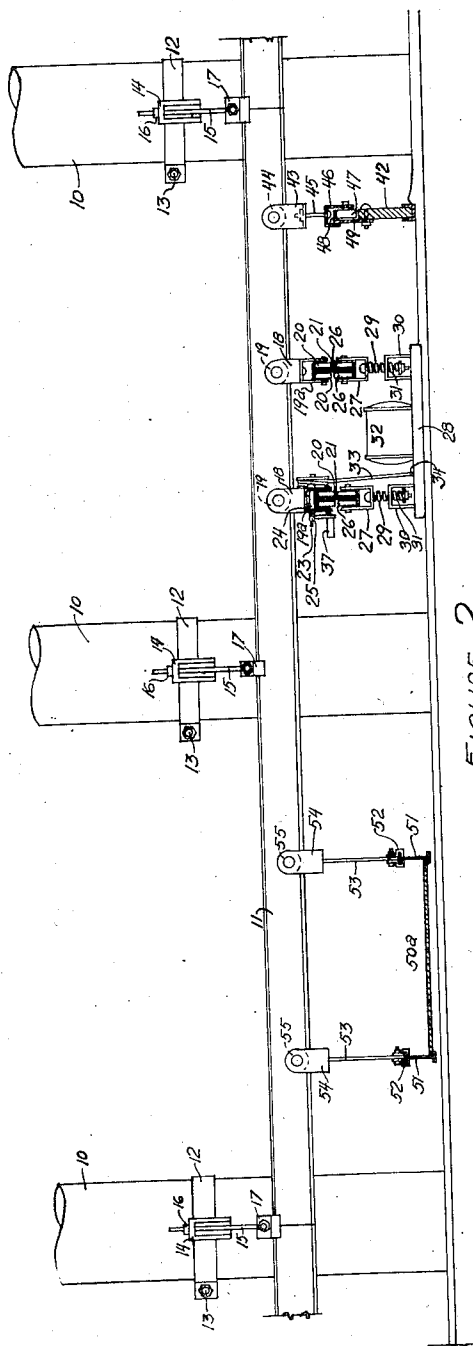


FIGURE 2

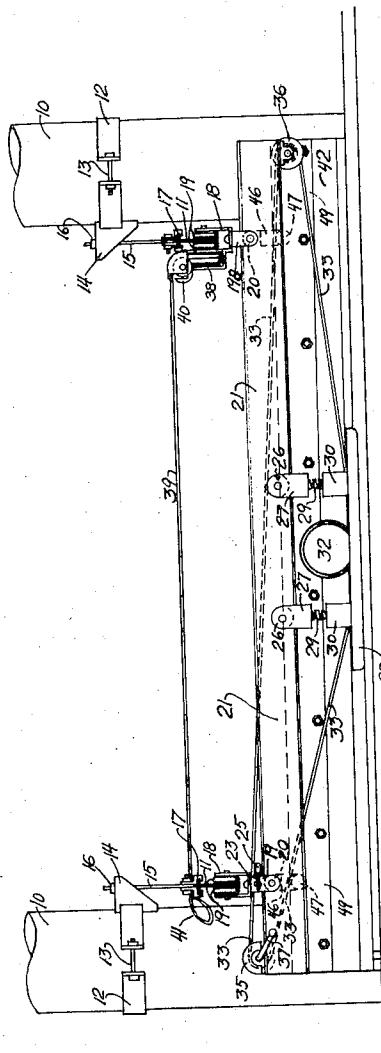


FIGURE 3

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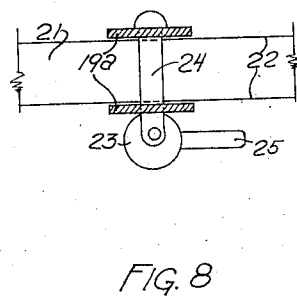
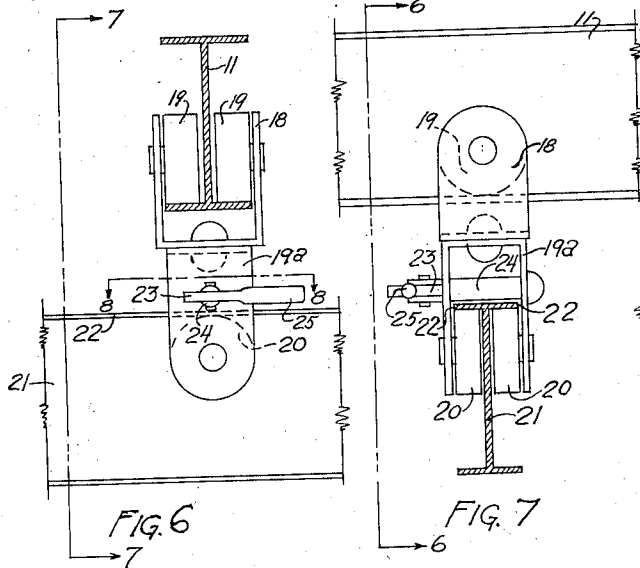
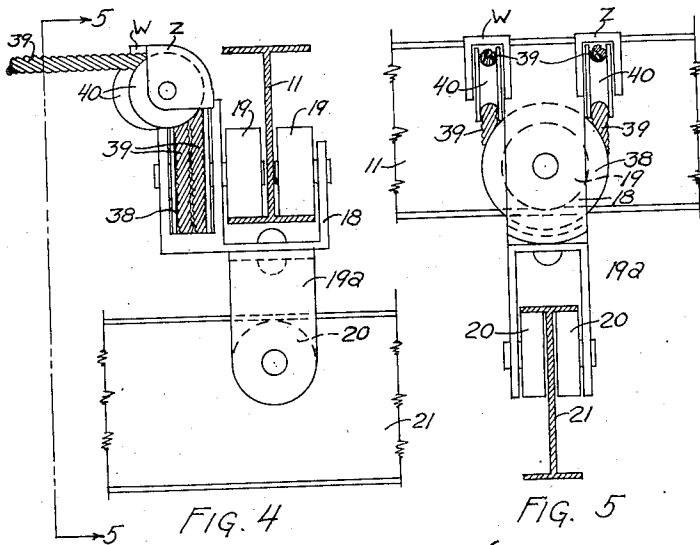
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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,038,416

MACHINE FOR LEVELING AND COMPACTING
FLOOR COVERING

Dell G. Clifford, Chicago, Ill.

Application July 30, 1931, Serial No. 553,989

6 Claims. (Cl. 94—48)

This invention relates in general to concrete working machines, but more specifically to an improved machine for leveling composition floors in a building, room or other area where columns are distributed throughout such room or area.

Heretofore considerable difficulty and inconvenience has been experienced in leveling such floors, owing to the fact that the columns or pillars interfere with the work, and furthermore considerable work has been necessary to produce a level floor.

It is one of the objects of the present invention to overcome all of these difficulties and objections and to provide an improved apparatus for attaining these ends, and which apparatus is adapted to be supported by, and travel upon, rails or the like, which latter are supported by the columns and adapted to be adjusted vertical with respect thereto, and which rails may be secured in position at any desired height above the floor, to compensate any desired thickness of covering, and at the same time the frame or supporting structure will be maintained out of contact with the surface upon which the covering is to be laid.

A further object is to provide an improved apparatus of this character embodying a vibrator plate which is movable in any direction with respect to the work.

A further object is to provide improved means individual to the ends of the apparatus for advancing them upon the supporting track or frame.

To the attainment of these ends, and the accomplishment of other new and useful objects as will appear, the invention consists in the features of novelty, in substantially the construction, combination and arrangement of the several parts hereinafter more fully described and claimed and shown in the accompanying drawings illustrating this invention in which,

Figure 1 is a view partly in elevation and partly in horizontal section, showing the top of an apparatus of this character constructed in accordance with the principles of this invention.

Figure 2 is a vertical sectional view taken on line 2—2 Figure 1.

Figure 3 is a transverse sectional view taken on line 3—3 Figure 1.

Figure 4 is a detailed sectional view, on an enlarged scale, taken on line 4—4 Figure 1.

Figure 5 is a sectional view taken on line 5—5 Figure 4.

Figure 6 is a view taken on line 6—6 Figure 7.

Figure 7 is a view taken on line 7—7 Figure 6.

Figure 8 is a detailed sectional view taken on line 8—8 Figure 6.

The apparatus is adapted to be supported by means of columns 10 which are arranged at spaced intervals throughout the area of the surface upon which the covering such as concrete, plastic material, or other similar material is to be laid, and the entire apparatus is supported by means of the columns 10.

The apparatus in the form of the invention shown, consists preferably of several different parts which are adapted to travel upon tracks or ways 11, which latter may be of any desired construction but are preferably of an I beam configuration. These tracks may be of any desired length, and are adjustably held in position upon the columns 10 by means of suitable clamping devices, preferably in the form of bands which encompass the respective pillars, and the ends of the bands are secured together by suitable fastening bolts 13, so that by adjusting the bolts the bands may be tightened to prevent them from moving lengthwise of the columns, or loosened to permit them to be adjusted vertically of the columns, so as to sustain the tampering plate and other mechanism to be hereinafter described, at any desired or suitable distance above the surface upon which the material is to be laid.

Obviously the inner faces of the bands 12 may be provided with a protecting cover (not shown) if desired, so as not to injure the columns or pillars, and to provide a better grip upon the columns.

The bands 12 are secured in any suitable manner to a bracket 14, and passing through the bracket is a hanger rod or member 15, and to which rod may be adjustably secured a nut or collar 16 which rests upon the top of the bracket. Clamping members 17 are secured to the end of the hanger member 15 and these clamping members 17 are of a configuration to receive the upper flanges of the I beam 11.

Any number of brackets and bands 12 may be employed so as to support the tracks or ways 11 from any desired point throughout its length. In the present form of the invention two of these tracks or ways are shown, which are arranged parallel with each other and constitute the main support for the apparatus.

Carriages designated generally by the reference numeral 18, are provided with rollers 19 adapted to run upon the lower flange of the I beams 11, one of the rollers 19 being disposed on each side of the web of the track, and connected with the carriages 18, to swivel with respect thereto and

to depend therefrom are hangers 19^a provided with rollers 20, which latter are disposed on opposite sides of the web of the I beams 21, and engage and are adapted to roll against the lower surface of the upper flange 22 of the beam 21. Any number of these carriages 18 may be provided and in order to hold the I beams 21 and the carriage against movement one with respect to the other, any suitable fastening means may be provided, such as an eccentric 23, which is connected with the bolt 24 that passes through the walls of the hanger 19^a.

Connected to the eccentric 23 is a handle 25 so that by rotating the eccentric 23 the walls of the carriage 19 may be moved towards or away from each other, and into and out of, clamping relation with respect to the flange 22 on the I beam 21.

The I beams 21 are of any desired length, and run transversally with respect to the tracks or ways 11, and traveling upon the lower flanges of the I beam 21 are rollers 25 arranged on opposite sides of the web of the beam 21, and which rollers are connected to a carriage 27.

A tamper plate 28 which is preferably constructed of thin material and provided with an upstanding flange encompassing its periphery, as clearly shown in Figure 1, is supported from the carriage 27, in any suitable manner, preferably by means of a yielding or spring connection 29 disposed between the carriage 27 and a bracket 30, which is secured to the tamper plate 28. A spring 29 is arranged on one side of the bracket while a spring 31 is arranged on the other side of the bracket, and these springs operate to yieldingly hold the tamper plate 28 against the work, and also permit of a vibratory movement of the tamper plate with respect to the brackets.

The springs are held in position preferably by means of bolts and nuts 29^a by means of which the plate 28 may be adjusted toward and away from the carriage and such connection also forms swivels to compensate the adjustment of the beams 21 with relation to the carriages.

Any number of these supporting brackets may be provided according to the size of the tamper plate, and in any suitable manner, and the tamper plate may also be of any desired configuration. Mounted upon the tamper plate is a motor or vibrator 32 which is operated in any suitable manner, preferably from a source of electric current (not shown), that is to say, that when the vibrator 22 is operated and when the tamper plate 28 moves against the surface of the material, which has been deposited upon the surface to be covered, a vibratory movement will be given to compact the material.

At the same time the vibrator plate may be moved in any desired direction with respect to the work, that is, it may be moved lengthwise of the tracks 11, or it may be moved transversely to the tracks or ways 11, through the medium of the carriage 27 and the rollers 26 which run upon the flange of the I beams 21. Thus it will be seen that the vibrator plate may be adjusted in both directions and as the work progresses.

As a means for moving the vibrator plate 28 transverse to the direction of the tracks or ways 11, there may be provided a cable 33 one end of which is secured to the tamper plate 28 as at 34, and the cable passes over pulleys 35—36 arranged preferably adjacent the ends of the beams 21, and the cable is secured by its other end as at 34 to the tamper plate. Thus it will be seen that by pulling upon the cable 33 the tamper

plate 28 may be moved in one direction or the other, according to the direction of pull upon the cable. Obviously, and if desired, a handle or crank 37 may be connected with one of the pulleys 35—36 for facilitating in the operation of the cable and adjustment of the vibrator plate.

The tracks or ways 11 are spaced laterally from each other for a considerable distance, and being supported by the columns 10, the beams 21 are of a length that they will project between the adjacent columns in the direction transverse to the guides or ways 11 so as to permit the tamper plate 28 to be moved between the adjacent columns.

Means may be provided for advancing the tamper plate by advancing the cross beams 21, in the direction lengthwise of the guides or ways 11 and from one side of the machine. To that end there may be provided a drum 38 (see particularly Figure 4) which is secured to the axis of one of the pulleys 19 (see particularly Figures 4—5). Over this pulley 38 a continuous cable 39 is wrapped, several times, and the runs of the cable adjacent the drum preferably pass over spacing pulleys 40, arranged on axes transverse to the axis of the drum 38.

The cable 39 is preferably formed into a looped end 41, and is placed in any convenient position for the operator. Thus by manipulating the cable 39 from one side of the machine, preferably the side on which the crank is located, it will be manifest that the drum 39 will be rotated and as the drum 39 is rotated the pulleys or rollers 19 will be rotated and this will cause the beams 21, that is the farther end of the beam, to be moved lengthwise of the track or way 11. The end of the beam 21 adjacent the operator may be moved by hand or by any other suitable mechanism which may be provided for that purpose.

It will be manifest that after the beam 21 has been adjusted lengthwise of the guides and tracks 11 the crank may be operated to move the tamper plate 28 backward or forward across the work transverse to the guides or ways 11.

Any suitable means may be provided for smoothing or leveling the material dumped upon the surface to which it is to be applied, such as a striker board or straight edge 42 (see particularly Figure 2). The striker board 42 is mounted for movement lengthwise of the tracks or ways 11, and also for movement in a direction transverse thereto so that a vibratory movement may be imparted to level the work. To that end there may be provided a carriage 43 having rollers 44 which run upon the lower flange of the tracks or ways 11. Depending from the carriage 43 is a hanger 45 carrying a supplemental carriage 46 upon which latter is mounted a roller or wheel 47 which engages under a flange 48 of a member 49 that is secured to the striker board. The rollers 47 serve as a support for the striker board.

Thus it will be seen that the striker board can be moved transverse to the length of the tracks or ways 11 by reason of the flange or member 49 resting upon rollers 47, and the striker board with the associated parts may be also bodily moved lengthwise of the tracks or ways 11 through the medium of the supporting rollers 44.

A platform 50^a may also be provided upon which the workmen may stand or kneel during certain operations, and at the same time the weight of the workmen will be supported above and out of contact with the work. The platform 50^a may be of any desired construction and is preferably secured to supporting members 51, preferably in the

form of I beams, which latter are secured by clamps 52 to hangers 53, the latter being connected to a carriage 54, upon which rollers 55 are mounted, and these rollers run upon the lower flange of the tracks or ways 11.

Thus it will be seen that this supporting structure may be moved lengthwise of the tracks or ways according to the will of the operator, and even at a time when the operators are upon the platform 50^a.

With this improved apparatus it will be manifest that floors of this character may be laid in buildings where there are provided a number of columns throughout the area of the surface to be covered, and that the presence of columns will not interfere with the laying of the floor, as the columns form the main support for the apparatus, and the parts are so constructed that the tampering plate and the striker plate may be moved to positions between adjacent columns, thereby rendering it possible to tamp the material at points in close proximity to the base of the columns.

Furthermore, all of the supporting structure is out of contact with the work, the only parts of the apparatus which are brought into contact with the work are the tamper plate and the striker board or the straight edge. At the same time the apparatus may be so adjusted that the coatings of the desired thickness may be provided on the surface.

By the use of thin material in the formation of the tamper plate 28, the plate will be flexed under the effects of vibration, and this will result in a kneading operation upon the material being laid, while the upstanding flange will not only serve to maintain the peripheral edge of the plate even, but will also serve to prevent the material from flowing or passing over on to the top of the tamper plate, without unduly increasing the weight of the plate.

While in the present form of the invention manual means have been disclosed for various adjustments of the working parts upon the tracks or ways, it is to be understood that, power mechanism (not shown) may be employed for that purpose, and while two main tracks or ways for supporting the structure have been shown, it is also to be understood that the number of supports may vary.

Further, it will be manifest that with this invention a substantially level floor may be produced.

Obviously temporary posts or uprights may be provided for supporting the apparatus.

The term "tamping plate" employed throughout the specification and claims is to be construed

to include a plate for the purpose of compacting and smoothing the material.

While the preferred form of the invention has been herein shown and described, it is to be understood that various changes may be made in the details of construction and in the combination and arrangement of the several parts, within the scope of the claims, without departing from the spirit of this invention.

What is claimed as new is:—

1. In a machine of the character described, a tamper plate, and means for supporting the plate in contact with the material being laid, said plate being movable upon its support across the material, the edges of the plate in the direction of its movement converging from one side of the plate towards the opposite side.

2. In a machine of the character described, a tamper plate, means for supporting the plate in contact with the material being laid, said plate being movable upon its support across the material, the edges of the plate in the direction of its movement converging from one side of the plate towards the opposite side, and an upstanding peripheral flange encompassing the plate.

3. A machine for compacting concrete and other material, which comprises a tamper plate formed of comparatively thin, flexible material applied to the surface of the material being laid, an upstanding flange at the periphery of the plate, and means for imparting a kneading action to the work by the plate, by flexing the body of the plate within the confines of the flange.

4. A machine for compacting concrete and other material, comprising in combination a tamper plate formed of comparatively thin, flexible material applied to the surface of the work, means mounted upon said plate for flexing the plate during its operation upon the material being laid, and means for bodily moving the plate over the material being laid.

5. A machine for compacting concrete and other material which comprises a tamper plate formed of comparatively thin, flexible material applied to the surface of the work, and means for flexing the body of the plate as it operates upon the work, the edges of said plate in the direction of its movement converging from one side of the plate toward the opposite side thereof.

6. A machine for compacting concrete and other material which comprises a tamper plate formed of comparatively thin, flexible material applied to the surface of the work, means for flexing the body of the plate as it operates upon the work, and an upstanding flange at the edge of said plate.

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