

March 24, 1942.

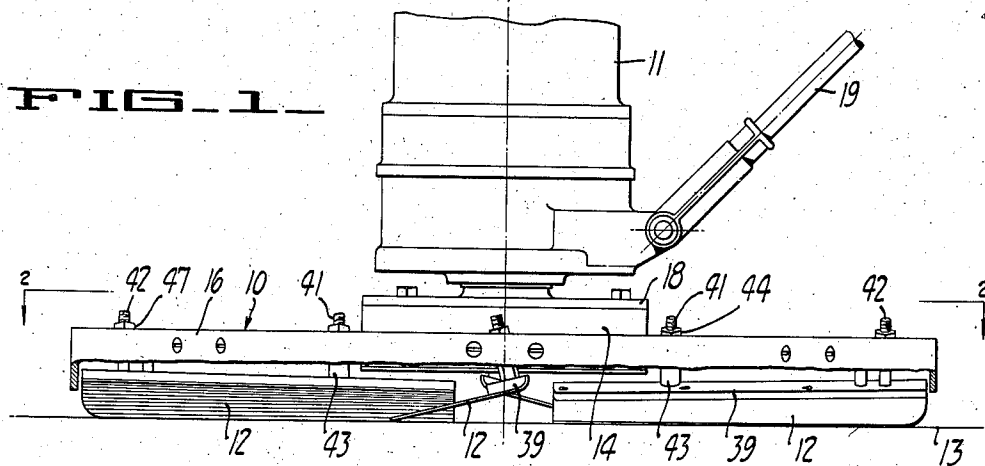
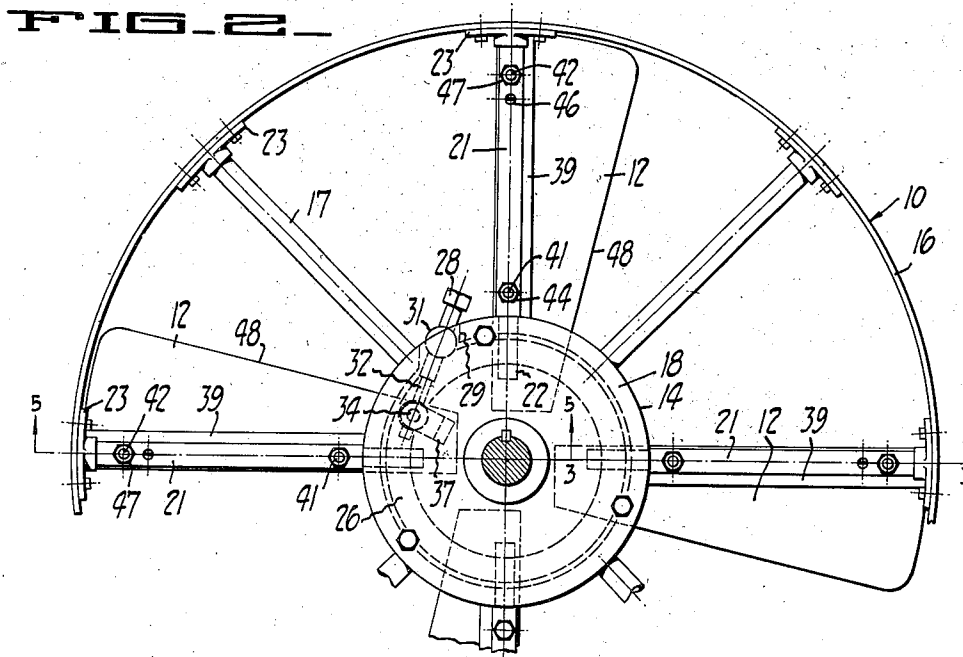
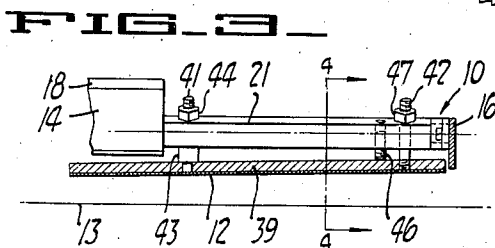
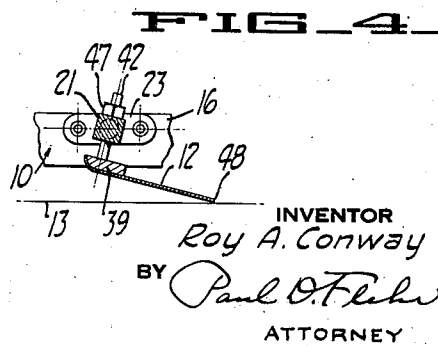
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2,277,389

CEMENT TROWELING APPARATUS

Filed Aug. 30, 1940

2 Sheets-Sheet 1



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FIG. 5-

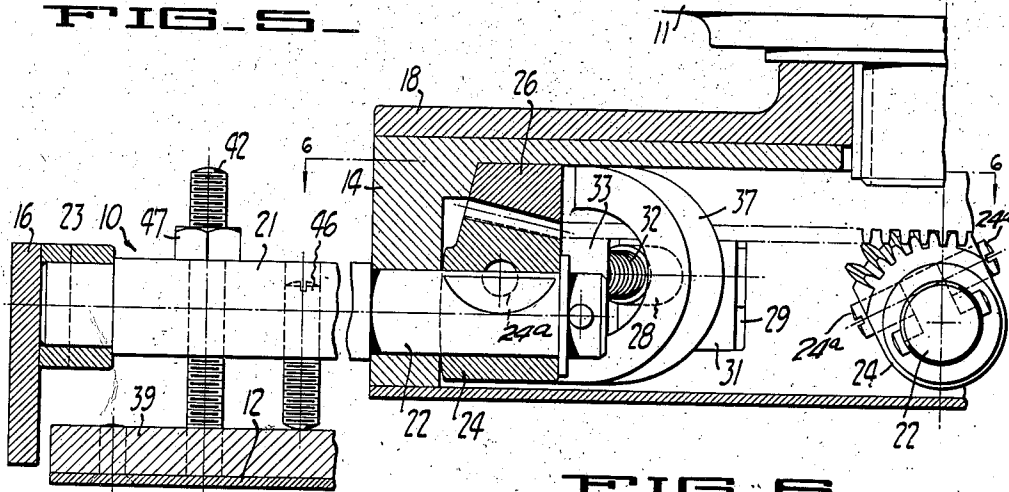


FIG. 6-

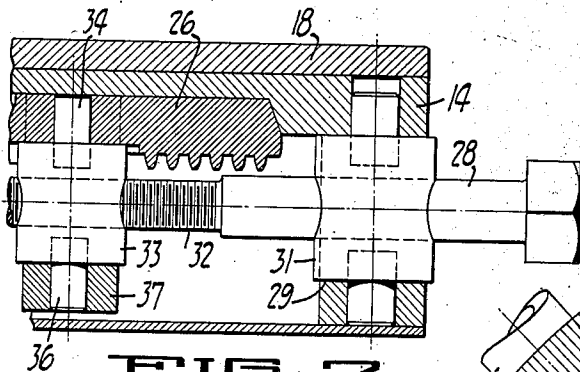
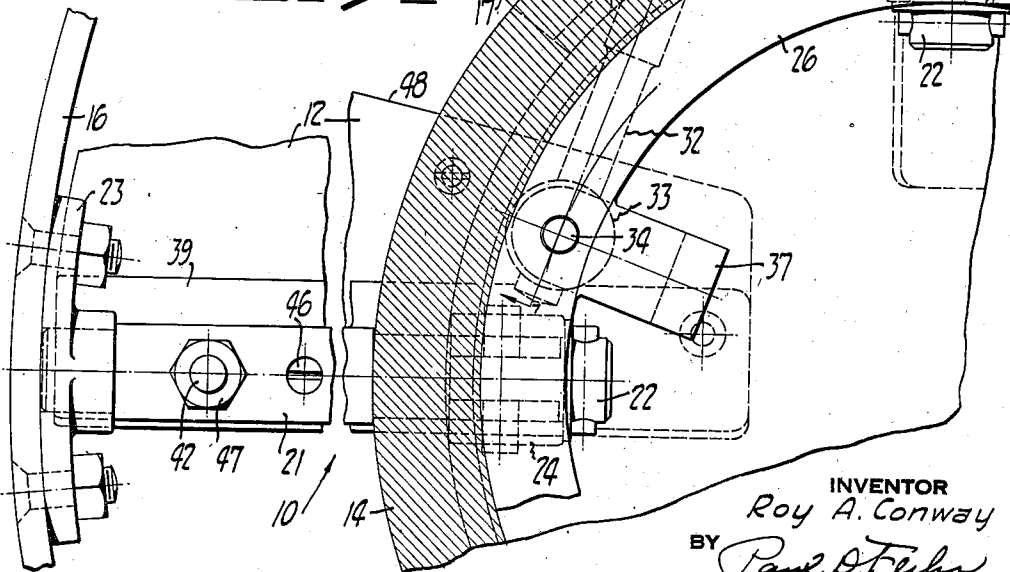


FIG. 7-



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CEMENT TROWELING APPARATUS

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Application August 30, 1940, Serial No. 354,790

5 Claims. (Cl. 94—45)

This invention relates generally to apparatus for performing troweling or floating operations on cementitious mixtures, such as wet mixtures of Portland cement.

An object of the invention is to provide troweling apparatus which can be quickly and readily adaptable by simple adjustments to suit varying conditions. In this connection, the invention is characterized by the use of troweling blades carried by a rotatable structure and normally disposed at an inclination to the plane of operation, together with adjusting means whereby an operator can simultaneously change the angle of inclination of each of the blades.

Another object of the invention is to provide a troweling device of relatively simple construction which can be readily manufactured, and which will be capable of relatively severe usage without necessitating frequent repairs or replacements.

Additional objects will appear from the following description in which the preferred embodiment of the invention has been set forth in detail in conjunction with the accompanying drawings.

Referring to the drawings:

Figure 1 is a side elevational view illustrating a machine incorporating the present invention;

Figure 2 is a plan view of the machine shown in Figure 1, but with the troweling blades turned to a horizontal position to facilitate illustration;

Figure 3 is a cross sectional detail taken along the line 3—3 of Figure 2;

Figure 4 is a detail taken along the line 4—4 of Figure 3, and showing the manner in which each blade normally engages the surface being troweled;

Figure 5 is a cross sectional detail on an enlarged scale taken along the line 5—5 of Figure 2;

Figure 6 is a cross sectional detail taken along the line 6—6 of Figure 5; and

Figure 7 is a cross sectional detail taken along the line 7—7 of Figure 6.

The machine illustrated in the drawings consists of a rotatable structure 10, adapted to be driven by a motor 11. The rotatable structure carries a plurality of troweling elements or blades 12 which are adapted to operate upon a flat or horizontal surface, such as the surface 13 in Figure 1.

The rotatable structure 10 preferably includes an inner hub 14 in the form of a hollow annular casing, together with an outer circular rim 16, which is secured to the hub by means of radial struts 17. A plate 18 is attached to the upper side of the hub 14, and is coupled to the drive shaft of the electric motor 11. Thus the structure 10 serves to support the motor, and the motor in turn rotates the structure over the surface to be troweled or floated. A suitable handle 19 is attached to the housing of the motor, so

that an operator may progress the machine over a floor surfacing.

The blades 12 are formed of spring metal, comparable to the material used in making hand floating trowels. The mounting means for the blades 12 includes the square shafts 21, which are radially disposed, and which have their inner end portions 22 extending through the side wall of the hub 14, and journaled thereto. The outer ends of the shafts are journaled in suitable castings or bearings 23, which are mounted upon the rim 16.

As a means for simultaneously adjusting the angular positioning of all of the shafts 21, the inner end portion of each shaft is secured to a segmental gear 24, located within the hub 14. Set screws 24a serve to retain each gear 24 at a desired angle with respect to its associated shaft. The segmental gears all mesh with a ring gear 26, which is seated within the hub, and which can be turned relative to the hub. As representative of suitable adjusting means which can be manipulated by the operator, I have shown an adjusting screw 28 extending through an opening 29 in one side of the hub. Mounted within the opening 29, there is a pintle 31 through which the screw 28 extends and to which it is journaled. The inner threaded end portion 32 of screw 28 engages a nut 33, and this nut has one end directly connected to the ring 26 by a pivot pin 34, and its other end connected by pivot pin 36 to a yoke 37, which in turn is rigidly attached to the ring 26. Turning of screw 28 changes the angular setting of ring 26 with respect to the hub, and this in turn causes simultaneous rocking movement of each of the shafts 21.

Suitable means, enabling individual adjustments of each blade, is employed for attaching the blades to the shafts 21. Thus the advancing edge of each blade is attached to a rigid reinforcing bar 39, and this bar is secured to the lower ends of the studs 41 and 42. Both of these studs extend through openings provided in the associated shaft 21. Stud 41 carries a spacing collar 43 interposed between shaft 21 and the adjacent part of bar 39, whereby upon turning down nut 44, bar 39 can be clamped against collar 43 and held rigidly with respect to the shaft. Near the stud 42, shaft 21 is threaded to receive an adjusting screw 46, the lower end of which engages the upper face of bar 39. By adjusting screw 46, the height of the outer end of bar 39 with respect to shaft 21 can be adjusted, and any given adjustment can be retained by tightening nut 47 on stud 42.

It will be noted from Figure 2 that the trailing edge 48 of each trowel blade 12 is at an angle to the axis of its corresponding shaft 21, and also inclined slightly with respect to radii taken from the center of rotation of the structure. There-

fore, in order to have the trailing edges 48 bear evenly upon a flat surface 13 to be troweled, when the blades are tilted as shown in Figure 1, the outer portion of each mounting bar 39 may be raised somewhat with respect to its inner end, as shown in Figure 3.

Operation of the machine described above can be briefly outlined as follows: The machine is placed upon a surface to be troweled, which is usually a floor surfacing. Where the floor consists of a customary hydraulic Portland cement mixture, the surface may have been previously treated to prepare it for the troweling operation. For example, after the concrete has been poured and permitted to set for a given length of time, it may be roughly surfaced as by means of a motor driven disc, and a fine clean sand applied over the surface prior to being troweled with the present machine. The operator holds the handle 19 while the motor is in operation, and the motor rotates the entire structure 10 at a suitable rate, as for example 50 to 150 revolutions per minute. The trailing edges 48 of the trowel blades act upon the cementitious surface to produce a smooth and compact finish. The operator gradually progresses the machine over the entire flooring being surfaced, taking care to produce substantially a uniform degree of troweling over all areas.

The angle of the blades 12 with respect to the plane of operation of the trailing edges 48 depends upon the degree of hardness of the surface being troweled. In general the harder the surface, the steeper will be the angle of the blades. Such adjustments can be readily made by the operator simply by turning the screw 28. Occasionally the blades may be adjusted individually to compensate for uneven wear, or in case a worn blade is replaced. Such individual adjustments can be made by changing the setting of set screw 46 in conjunction with a change in the setting of nut 47, in which case the corresponding bar 39 is in effect rocked about the spacing collar 43. If more substantial adjustments are necessary, collar 43 can be replaced with other collars of varying size, or washers can be applied to change the spacing of bar 39 with respect to the shaft.

My machine is capable of efficient troweling or floating action, particularly since it is a simple matter to have the trowels bear equally upon the surface being finished. It has been found that where the trowel blades do not bear equally, as for example when one trowel bears harder than the others, or when a trowel wears unevenly along its length to bear improperly, the machine does not operate smoothly but tends to chatter, with the result that the desired smooth hard surface cannot be obtained.

I claim:

1. In cement troweling apparatus, a rotatable structure including a central hub, a plurality of shafts journaled by the structure and extending outwardly from the hub, blades mounted upon said shafts and arranged so that corresponding edges of the blades may operate upon a common horizontal surface to be troweled, gears secured to the inner ends of said shafts, a ring gear within the hub and engaging said first named gears, and means for rotating said ring gear to adjust the angular setting of said ring gear with respect to the hub, whereby the inclination of each of said blades is varied.

2. In cement troweling apparatus, a rotatable structure, radially disposed members journaled to said structure for rotation about their individual axes, a plurality of radially disposed troweling blades arranged so that their corresponding lower edges are in a common plane corresponding to the surface to be troweled, means for attaching each of said blades to a corresponding member, said attaching means comprising means for individually adjusting each of the blades with respect to said plane, and means having an operating connection with each of said members for simultaneously rotating said members to vary the angle of inclination of all of the blades with respect to said plane.

3. In cement troweling apparatus, a rotatable structure, a motor carried by the structure and adapted to drive the same, a plurality of troweling blades associated with said structure, said blades extending in directions generally radial with respect to the axis of rotation of the structure and being so disposed that their corresponding lower trailing edges are in a common plane corresponding to the surface to be troweled, radially disposed shafts rotatably secured to the structure, means serving to mount each of said blades on an associated shaft, said mounting means including elements adjustable whereby the position of each blade may be adjusted with respect to its corresponding shaft, and means for simultaneously turning all of said shafts to vary the inclination of the blades, said means including an adjustable connection whereby the angular setting of any one shaft can be adjusted independently of the others.

4. In cement troweling apparatus, a structure rotatable about a vertical axis, a plurality of radially disposed troweling blades, the blades being so disposed that their corresponding lower edges are in a common plane corresponding to the surface to be troweled, radially disposed members rotatably journaled to said structure, means connecting each of said blades to an associated member, said means including elements adjustable for moving each of said blades about an axis at an angle to the radial axis of its associated member, thereby effecting an individual adjustment of the blade with respect to said plane, and means for simultaneously rotating all of said members about their respective radial axes to vary the angle of inclination of all said blades with respect to said plane.

5. In cement troweling apparatus, a structure rotatable about a vertical axis and including a central hub, a plurality of shafts journaled on the structure and extending outwardly from the hub, blades mounted upon said shafts and arranged so that corresponding edges of the blades may operate upon a common horizontal surface to be troweled, and means for simultaneously adjusting the angular setting of all of said shafts whereby the inclination of the blades can be simultaneously varied, said means comprising a member mounted on the structure to rotate about the vertical axis of the same, and a plurality of motion-transmitting elements secured to the inner ends of said shafts and having drive connections with said member.

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