Dec. 16, 1952 H. G. FLETCHER 2,621,568

CONCRETE TROWELING MACHINE AND ATTACHMENT THEREFOR

Filed Sept. 23, 1946 2 SHEETS—SHEET 1

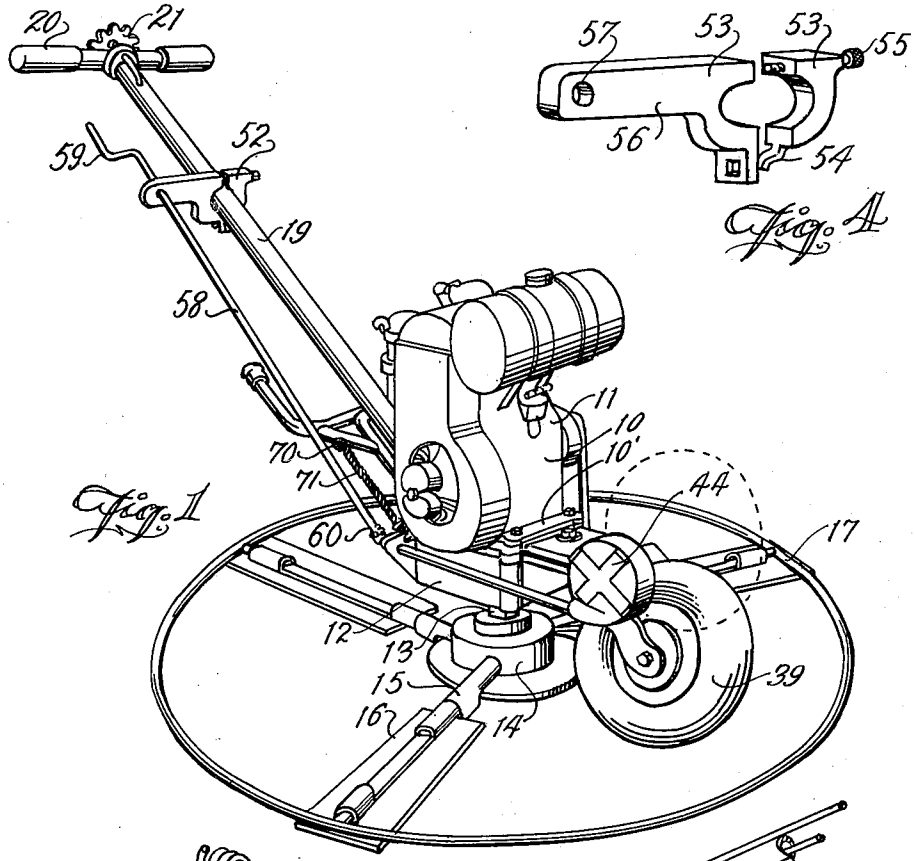


Fig. 1

Fig. 4

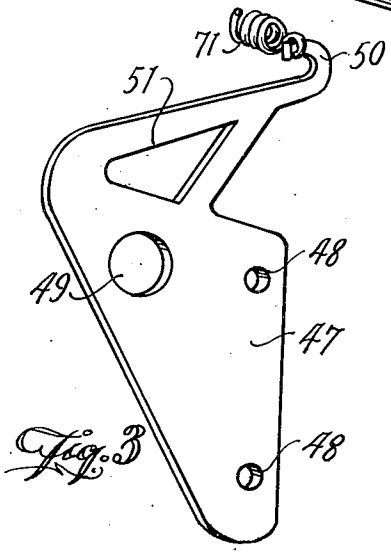


Fig. 3

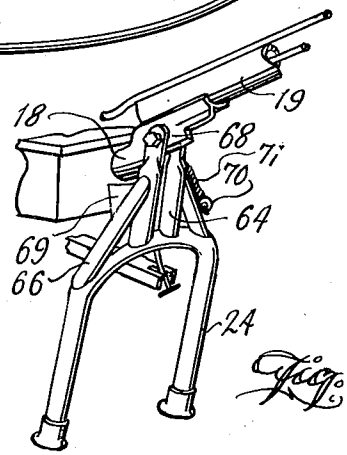


Fig. 2

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CONCRETE TROWELING MACHINE AND ATTACHMENT THEREFOR

Filed Sept. 23, 1946 2 SHEETS—SHEET 2

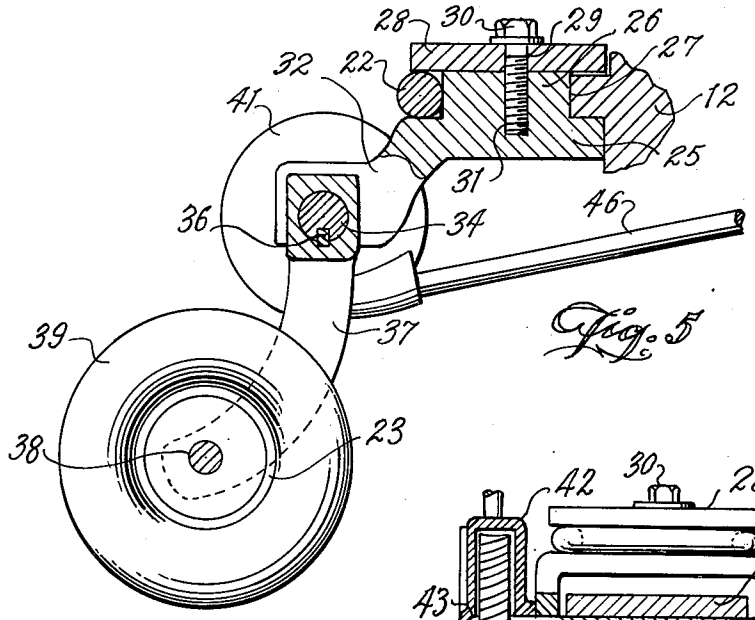


Fig. 5

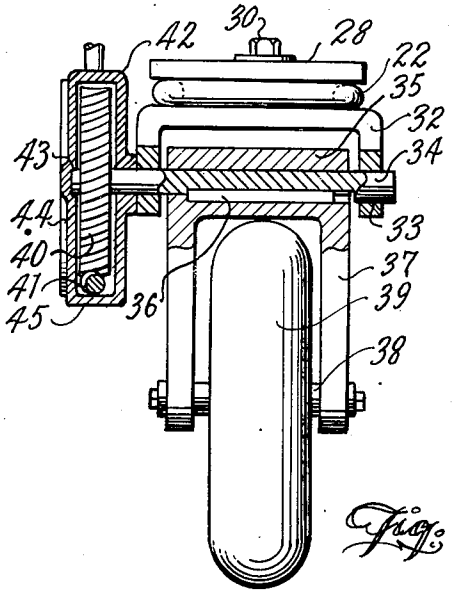


Fig. 6

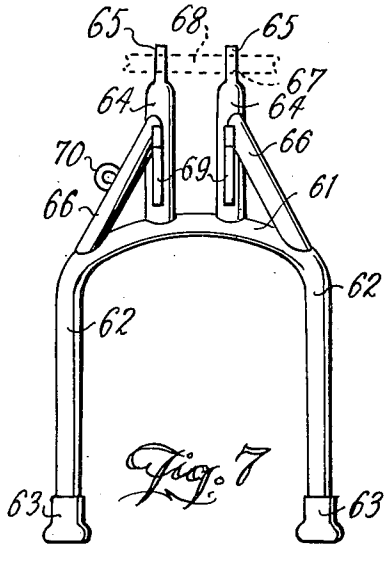


Fig. 7

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Patented Dec. 16, 1952

2,621,568

UNITED STATES PATENT OFFICE

2,621,568

CONCRETE TROWELING MACHINE AND ATTACHMENT THEREFOR

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Application September 23, 1946, Serial No. 698,760

4 Claims. (Cl. 94—45)

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This invention relates to new and useful improvements in concrete troweling machines and attachments therefor.

Concrete troweling or finishing machines have come into widespread use. These machines comprise a plurality of horizontally directed arms carrying relatively thin metallic troweling or floating blades, which are adapted to be driven by a small gasoline engine or an electric motor, and are designed to be moved about by a handle bar connected to the frame of the engine or the gear housing usually disposed therebelow. A relatively light-weight ring encompasses the outer extremities of the floater or troweling blades, this ring acting as a guard ring to prevent obstructions from being struck by the blades as they rotate, and partially to aid in supporting and holding the blades in proper alinement.

Various means have been devised for moving these machines from point to point such as on or off of a fresh concrete slab, or into and out of vehicles such as trucks in which the machines are transported from place to place. Being formed of relatively thin metal, the troweling blades are easily damaged in the course of such handling and must often be replaced due to such damage before they have been worn out in the course of normal use. It is also often necessary to remove the blades in the course of storing or of moving the machine from one place to another so as to prevent damage to the former, and no adequate provision has been made to allow the ready removal and replacement of the blades and the guard ring.

It is, therefore, one object of this invention to provide an improved concrete troweling machine wherein means are provided to allow the quick and ready movement of the machine onto and off of a concrete slab, or into and out of vehicles such as trucks.

Another object of this invention is to provide an improved troweling machine having supporting means for holding the machine in an upright position while supporting the troweling blades clear of the supporting surface.

Yet another object of the invention is to provide an improved troweling machine having a ground wheel mounted thereon in such a fashion as to permit the wheel to be swung into an operative or inoperative position; and wherein means are provided, cooperating with the wheel, for supporting the machine in an upright position, said wheel and cooperating means supporting the machine so that the weight thereof is not carried

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by the troweling blades, the latter being held clear of the ground or other supporting surface.

Yet another object of the invention is to provide an improved attachment for troweling machines which may be readily and quickly connected to the machine so as to form a permanent part thereof, said attachment permitting one man to move the machine about at will when troweling work is not being done.

A still further object of the invention is to provide an improved attachment for concrete troweling machines of the type having a handle bar and adapted to be operated by one person, wherein a ground wheel is provided for supporting the machine so that it may be moved about when not in operation, said wheel being adapted to be moved into an operative or an inoperative position by controls carried upon the handle bar, so that the operator, without other aid, can easily and quickly actuate the attachment so as to place it in an operative position to permit the ready moving about of the machine without undue loss of time or physical exertion.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing, wherein an example of the invention is shown, and wherein:

Fig. 1 is an isometric view of a cement troweling machine constructed in accordance with this invention and showing the ground wheel in an operative position,

Fig. 2 is a fragmentary, isometric view, taken from the rear of the machine, and showing the bipod rest in an operative position,

Fig. 3 is an enlarged isometric view of the lower operating rod supporting bracket,

Fig. 4 is an enlarged isometric view of the upper operating rod supporting bracket adapted to be clamped on the handle bars,

Fig. 5 is an enlarged vertical sectional view of the ground wheel mounting,

Fig. 6 is an enlarged transverse, vertical, sectional view of the ground wheel mounting, and

Fig. 7 is an enlarged elevation of the supporting bipod.

In the drawings, the numeral 10 designates a concrete troweling machine having the usual frame 10' carrying a gasoline engine 11 mounted upon a suitable gear box or housing 12 which has a depending drive shaft 13. A hub 14 is carried by the drive shaft, and is provided with radially

extending, horizontal arms 15 upon which troweling blades 16 are secured. A guard ring 17 is secured to the extreme outer ends of the arms 15.

The gear housing 12 is provided at one side with a suitable bracket 18, usually in the form of a casting, to which a tubular handle bar 19 is secured. The handle bar 19 is provided with the customary handles 20 at its upper end, and control knobs 21 for controlling the speed of the engine 11 and the angle of incidence of the blades 16 with respect to the concrete surface being troweled.

It is customary to use at least two types of blades, one for troweling the concrete surface and one for floating the concrete surface. It is often necesary to change these blades, although in some types of these machines, reversible blades are provided.

In moving these machines from place to place, or on to or off of a concrete slab being finished, the handle bar 19 is utilized as a handle to pick up and support one side of the machine. A suitable carrying fitting, such as a socket and detachable handle on the opposite side of gear housing casting 12 (not shown) or a laterally projecting U-shaped yoke 22, as shown in Fig. 5, is provided. Obviously, such an arrangement requires the utilization of two workers in order to move the machine, and it is very difficult for as few as two men, with such a supporting arrangement, to load the machine into or out of a truck or other vehicle. In addition, a relatively unstable purchase for supporting the machine is provided, so that at best only a clumsy arrangement is obtained.

This invention contemplates a ground wheel 23 which may be connected with the yoke 22, and a suitable bipod support 24 which may be secured to the opposite side of the machine, so that a supporting and transporting arrangement very similar to that of a wheel barrow, is provided. The U-shaped yoke 22 has its ends secured to the housing and is provided with a rectangular opening 27.

For mounting the wheel 23, a substantially rectangular casting or block 25 is employed. The block 25 is relatively flat and of approximately the same shape as the horizontal cross section of the yoke 22. The block is provided with an upstanding boss or lug 26 in its central portion, the lug 26 substantially conforming to the opening 27 of the yoke 22, so that the block 25 may be placed beneath the yoke with the lug 26 engaging therein. A retaining plate 28, similar in shape to the block 25, is disposed on top of the yoke 22 so as to engage the upper surface of the lug 26, and is provided with a central opening 29. A suitable bolt 30 extends through the opening 29 and engages within a screw-threaded bore 31 provided in the lug 26 and block 25. The bolt 30 may thus be tightened to clamp the yoke 22 between the plate 28 and the block 25 so as to rigidly secure the block with respect to the yoke and the gear housing 12.

The block 25 is provided with a pair of forwardly extending, offset ears 32, one of said ears being disposed at each side of the block. The ears are offset downwardly and carry transverse openings 33 through which a shaft 34 extends. A sleeve 35 is disposed on the shaft 34 between the ears 32, and suitably splined to the shaft with a key 36, whereby the sleeve is incapable of rotation with respect to the shaft. A pair of spaced arms 37 extend laterally of the sleeve 35, and are formed integrally therewith. The arms 37 are curved forwardly, as shown in Fig. 5, and depend vertically from the sleeve when the wheel is in an operative position as shown in Figs. 5 and 6. The ground wheel 23 is rotatably mounted between the lower ends of the arms 37 upon a suitable shaft 38. If desired, the wheel may be provided with the usual rubber tire 39.

For rotating the sleeve 35 so as to swing the arms 37 upwardly and move the wheel into an inoperative position, a suitable worm gear actuating means is provided. The worm wheel 40 is secured on the laterally projecting, left hand end of the shaft 34, being connected thereto so as to be incapable of rotation with respect to said shaft. A suitable sheet metal housing 41 encloses the worm wheel 40, the housing being provided with a flanged opening 42 in its inner wall to receive the shaft 34. The housing may be secured to the left hand ear 32 by welding or any other suitable means. The outer end of the shaft 34 is journaled in an opening 43 formed in the outer wall of the housing, and suitable reinforcing straps 44 extend transversely of said outer wall, being welded or otherwise secured thereto. Obviously, the housing may be cast or otherwise suitably fabricated.

A worm 45 is disposed in the lower portion of the housing so as to engage the worm wheel 40, the worm being positioned so as to have its longitudinal axis slightly inclined with respect to the horizontal. The worm is carried by and secured to a suitable actuating shaft or rod 46 which enters the housing 41 from the rearward side and extends rearwardly thereof to a point a short distance beyond the opposite side of the gear housing 12.

Obviously, rotation of the shaft 46 will cause rotation of the worm 45 and thereby the worm wheel 40. Rotation of the worm wheel 40 causes rotation of the shaft 34, and the sleeve 35, whereby the arms 37 are swung in a vertical arc to raise the wheel 23 into an inoperative position, or to lower the wheel into an operative position in contact with the ground surface. Due to the mechanical advantage provided by the worm gear drive, relatively little torque need be exerted on the actuating rod 46 to swing the ground wheel downwardly and raise the machine 10 from the ground surface. Similarly, in lowering the machine for troweling work, relatively little force is required to raise the ground wheel into an inoperative position.

The rearward end of the actuating rod 46 is supported in a suitable bracket 47, as shown in Fig. 1 of the drawings. The bracket 47 is shown in detail in Fig. 3 and formed of a substantially triangular shaped sheet disposed with its acute angle directed downwardly. Bolt holes 48 are provided along the inner edge of the bracket, while a larger opening 49 is formed near the upper and outer corner of the bracket for receiving the actuating rod 46. An upwardly directed hook 50 is provided at the upper end of the bracket 47, and lightening holes 51 may be utilized if desired.

The bracket is secured to the rearward side of the gear housing 12 by suitable bolts (not shown), which may be already present in the gear housing, or may be tapped thereinto. The rod 46 is thus rotatably supported between the bracket 49 and the housing 41.

A second bracket 52 is disposed upon the upper portion of the handle bar 19, as shown in Fig. 1, the details of the bracket 52 being shown in Fig. 4. The bracket 52 is in the form of split clamp

having two halves 53 pivoted at 54 at their lower ends and adapted to be clamped together around the handle bar 19 by a suitable bolt 55. An arm 56 projects laterally of one of the halves 53 and carries a transverse opening 57 in its outer end. An elongate crank rod 58 extends through the opening 57 and is provided with an offset crank handle 59 at its upper end, said crank handle being disposed a short distance below the handles 20 of the handle bar. The lower end of the crank rod 58 is connected to the rearward end of the actuating rod 46 by a suitable universal joint 60. The crank 59 may thus be rotated to revolve the actuating rod 46 and raise and lower the ground wheel 23.

For supporting the rearward side of the machine, the bipod support 24 is provided. As shown in Fig. 7, the support 24 is in the form of an inverted U-shaped element 61 having vertically depending legs 62. If desired, suitable rubber tips 63 may be provided on the lower ends of the legs. A pair of spaced upstanding arms 64 are secured to the upper end of the element 61 and carry ears 65 on their extreme upper end, the lateral spacing of the ears 65 providing the equivalent of a clevis. The arms 64 are suitably reinforced by lateral braces 66 extending from the arms to the upper ends of the legs 62. Suitable transverse openings 67 are provided in the ears 65, so that the support may be pivoted upon a bolt 68 extending transversely of the casting or bracket 18 upon which the handle bar 19 is supported. The support 24 is thus pivotally mounted upon the casting 18 so as to swing in a vertical arc in vertical alinement with the handle bar 19.

Triangular ears 69 are provided on the arms 64 and extend forwardly of the arms. When the support 24 is swung into its lower position, as shown in Fig. 2, the ears 69 engage the casting 18 and the gear housing 12 to prevent further forward swinging of the support. As shown in Fig. 2, when in an operative or supporting position, the support 24 has swung past its bottom dead center position so that the weight of the machine will tend to swing the support forwardly against the ears 69. The ears thus act as a stop to limit the forward swinging of the support.

An eye 70 extends laterally of one of the braces 66, and a coiled spring 71 is connected between the eye 70 and the upstanding hook 50 provided on the bracket 47. Since the hook 50 is disposed above and forward of the pivot point of the support 24, the spring 71 has a toggle action and holds the support in a raised or in a lowered position. Thus, as shown in Fig. 1, when the support is swung upwardly into an inoperative position, the spring tends to force the support further upwardly, thereby preventing the support from swinging downwardly due to the force of gravity. With the support in an operative position, as shown in Fig. 2, the spring tends to pull the support forwardly against the ears 69, so that the support is held against rearward movement into an inoperative position.

The operation of the device is very simple. When it is desired to move the troweling machine from one place to another, the crank 59 may be rotated to rotate the rod 58, the bar 46, and the worm 45, thereby rotating the worm wheel 40 and swinging the arms 37 downwardly, as described hereinbefore. When the ground wheel 23 has been moved to its lowermost position, the machine may be raised by the handle bar 19 around the ground wheel as a fulcrum and the support 24 swung downwardly into an operative position.

This swinging action may be accomplished by hand, or by pressing downwardly on one of the legs 62 with the foot. The machine may now be moved about at will, the operator raising the rearward portion of the machine by means of the handle bar and guiding it about on the wheel 23. The machine may be left at rest at any point upon the wheel and the upport 24. It has been found relatively simple for one man to trundle the machine into and out of a truck or other vehicle when utilizing this structure.

From the foregoing, it is clear that the structure includes the support or bipod prop 24 and the ground wheel support formed by the arms 37, the supporting ears 32, the shaft 34, and the associated elements.

Due to the positioning of the ground wheel with respect to the frame and the engine, the machine is well balanced when supported on said wheel, so that one person has no difficulty in handling the machine or moving it about.

When it is desired to resume troweling operations with the machine, the support 24 may be swung upwardly and the wheel 23 moved into its inoperative position, shown in dotted lines of Fig. 1, by reverse rotation of the crank 59. In this position, all of the elements are clear of the blades 16 and the engine 11 and do not interfere in any manner with the operation of the troweling machine.

As pointed out hereinbefore, in the course of troweling operations alone the blades 16 wear out quite rapidly. These blades are expensive, and their cost is a sizeable item in the expense of operation of one of these machines. It is quite advantageous therefore, to protect the blades against damage due to handling of the machine in moving it from one place to another. The present invention accomplishes this desirable result and at the same time requires the attention of only one person. A considerable saving in overhead expense for labor may thus be effected.

Obviously, the mounting for the support 24 and for the block 25 may be adapted to machines of different characteristics. For instance, a machine which did not utilize the handle 22 could be equipped with this device by mere modification in the shape and size of the mounting for the block 25.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. In combination with a troweling machine having rotating radiating blades thereunder with a handle projecting from one side of the machine and means for driving the blades in a horizontal circular path beneath the machine, a supporting and transporting structure for the troweling machine including, a ground wheel support movably mounted upon the machine for movement in a vertical plane, a ground wheel carried by the support, means for moving the support and ground wheel in a vertical plane with respect to the machine, and a rigid bipod prop movably connected to the machine on the opposite side of the center of the machine from the ground wheel, the bipod prop being constructed to be lowered within the circular path of revolution of the blades to coact with the

ground wheel in supporting the blades out of contact with the ground and to straddle one of the rotating blades in its lowered position so as to prevent rotation of the troweling blades when the prop is lowered.

2. The combination as set forth in claim 1 wherein the blades carry a guard ring upon their outer extremities, and both the prop and the ground wheel are constructed to be lowered within said ring.

3. The combination as set forth in claim 1 wherein the ground wheel support is carried by a supporting member attached to the troweling machine, said moving means comprising a horizontal rotatable shaft carried by the supporting member, means for rotating said shaft, said wheel support comprising a yoke carried by the shaft and extending therefrom so as to be swung in a vertical arc thereby, the ground wheel being rotatable in the yoke and being swung in a vertical arc thereby.

4. The combination as set forth in claim 1 wherein the prop is pivotally mounted upon the machine and constructed to swing in a vertical arc thereon.

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