

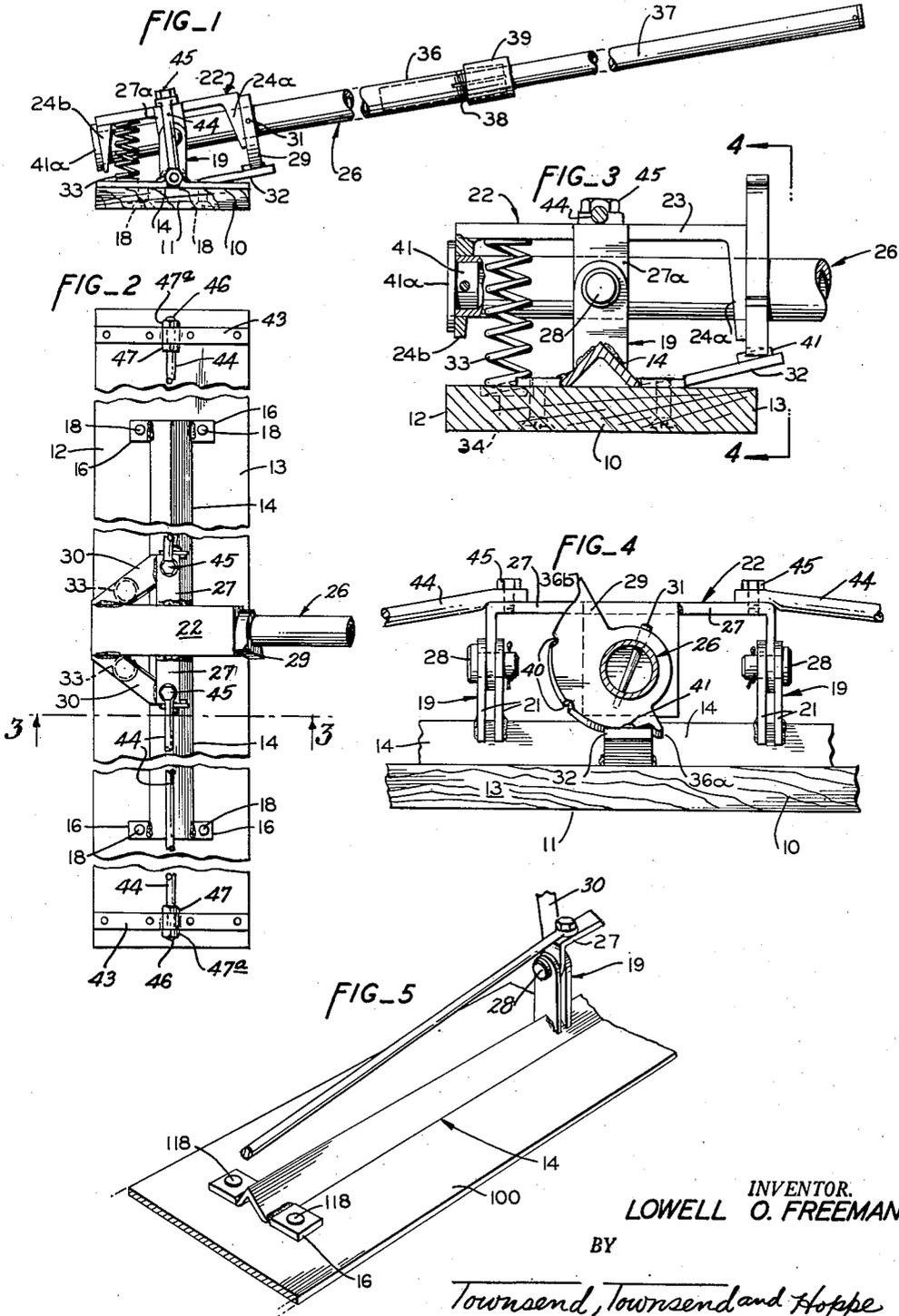
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L. O. FREEMAN

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ADJUSTABLE CONCRETE TROWELING TOOL

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INVENTOR.  
LOWELL O. FREEMAN

BY

Townsend, Townsend and Hoppe  
ATTORNEYS

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## ADJUSTABLE CONCRETE TROWELING TOOL

Lowell O. Freeman, Concord, Calif.

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This invention relates to a new and improved tool for working concrete, and more particularly, relates to a troweling instrument for leveling or smoothing wet concrete slab structures, such as concrete floors, walkways and the like.

In pour concrete floors, walkways and other relatively large, flat areas of concrete, it is customary for the workmen to employ relatively long handled troweling instruments for leveling, floating, and smoothing the wet concrete after it is poured. Not infrequently workmen are required to utilize floats or trowels provided with handles ranging in length from 12 to 18 ft. Generally speaking, the longer the handle length and the further away that a workman must stand from the working area, the more difficult it is to obtain a proper troweling action. More specifically, in working a troweling tool back and forth over the cement relatively toward and away from the workman, no particular difficulty is encountered to skilled artisans during times that the working handle length of the troweling tool is maintained within the limits of 12 to 14 ft. or less. However, when it becomes necessary for workmen to utilize longer handle lengths approaching 16 to 18 ft. or more it becomes very difficult and sometimes virtually impossible to back-trowel the tool in toward the workman without having the rear edge of the trowel or float dig or plough into the wet concrete and thereby render the concrete surface uneven or marred. In such instances it is a practical essential that a workman manipulate the handle as high above his head as he can reach in order to maintain the axis of the handle at a proper angle relative to the ground surface.

In this regard, as the angle between the handle and the ground surface of a conventional troweling tool decreases, the rearward or trailing edge of the flat troweling workpiece will tip or tilt below the leading edge. As a consequence, when the trowel is withdrawn or pulled rearwardly, the rear edge will, as above as above mentioned, tend to imbed itself and plow through the wet concrete rather than glide smoothly over the surface thereof.

The particular embodiment of the present invention, which is illustrated in the drawings, and which will be described hereinafter in greater detail, comprises generally a substantially flat, trowel type workpiece, such as a rectangular wood float or metal trowel piece, pivotally mounted to a workpiece frame and to which, in turn, is rotatably journaled an elongate handle having a maximum extended length of 24 ft. or so. Actuating means including cam means mutually associated with the handle and the troweling workpiece is operable upon axial rotation of the handle to tilt the rear edge of the workpiece upwardly relative to the axis of the handle and relative to the leading or forward edge of the workpiece, to permit convenient back movement of the workpiece when the tool is being worked utilizing relatively extended handle lengths of from perhaps 14 to 24 ft.

A principal object of the present invention, therefore, is to provide a concrete troweling instrument of the character briefly mentioned above and which is uniquely

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constructed to permit axial rotation of the handle to the trowel workpiece relative to the handle axis and to the workpiece to be conveniently maintained in flat co-planar contact with the surface of the wet concrete during troweling movements. The ability of a workman to tilt the trowel head from a remote point provides an important advantage over more conventional instruments within the same general class in which the angle of the troweling workpiece and the axis of the handle remains relatively fixed during any given troweling operation. Unlike such conventional tools, where it is necessary for workmen to work with a handle held above his head to maintain the troweling surface of the workpiece in co-planar contact with the surface of the concrete, the present device permits selective angular adjustment between the trowel piece and handle during working operations.

Other numerous objects and advantages of the invention will become apparent upon reading the following specification and referring to the accompanying drawings in which similar characters of reference represent corresponding parts in each of the several views.

In the drawings:

Fig. 1 is a side elevational view of a tool embodying the invention and showing portions of the handle broken away;

Fig. 2 is a fragmentary top plan view of the working head portion of the tool;

Fig. 3 is an enlarged side elevational view of the working head of the unit showing portions thereof broken away in section;

Fig. 4 is a transverse sectional view taken substantially on line 4-4 of Fig. 3 and showing the working head of the unit substantially in rear end elevation;

Fig. 5 is a fragmentary perspective view of a metal trowel workpiece incorporated as a component of the invention.

Referring now more specifically to Figs. 1-4 of the drawings, the embodiment of the invention is shown with particular reference to, and as incorporating, a trowel type workpiece in the form of a conventional rectangular wood float 10 defining a flat troweling undersurface 11 and parallel front and rear leading and trailing edges 12 and 13, respectively. Workpiece 10 is secured to a frame comprising, more specifically, an angle bar 14 extending along the major portion of the length of the float 10 and provided at its opposite ends with outwardly projecting welded lugs or ears 16. The lugs 16 are formed with threaded apertures for receiving countersunk machine screws 18 projected through the wood float 10.

A pair of stanchions, indicated generally at 19, spaced to either side of the center point of angle bar 14 and each comprising a pair of closely spaced vertical frame plates 21 welded to the angle bar 14, function pivotally to support a handle receiver component, indicated generally at 22.

More specifically, handle receiver 22 comprises a U-shaped member defining a web portion 23 having its lengthwise axis extending transversely to the axis of angle bar 14. Receiver 22 further comprises oppositely disposed parallel depending flanges 24a and 24b formed with registering apertures proportioned to rotatably receive and support the lower end of a telescopic handle, indicated generally at 26. The bearings formed by the apertured end flanges 24a and 24b of receiver 22 permit the handle 26 to be rotated about its own axis independently of movement imparted to the workpiece 10 or its supporting frame assembly 14.

The handle receiver 22 further incorporates a pair of oppositely disposed laterally projecting L-shaped arms 27 having depending legs 27a adapted to fit between plates 21 of the stanchion members 19. The legs 27a

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and plates 21 are formed with registering pin receiving apertures proportioned to accommodate pivot pins 28. It is observed that the pivotal axis defined by pins 28 is disposed horizontal and parallel to the leading and trailing edges 12 and 13 of the workpiece. As will more fully hereinafter appear, axis 28 permits the workpiece 10 to be tilted in selective angular adjustment relative to the lengthwise axis of handle 26.

A cam or eccentric 29 formed with a handle receiving bore is mounted on handle 26 and is pinned as at 31 or otherwise rigidly secured to said handle adjacent to the inner depending flange 24a of handle receiver 22. The cam is disposed vertically above the trailing edge 13 of the workpiece 10. A cam follower, comprising an inclined lever arm 32 rigidly secured as by welding to angle bar 14 and projecting angularly upwardly and rearwardly therefrom is adapted to be engaged by the cam surface of the eccentric 29.

Cam follower 32 is normally maintained in spring biased engagement against the cam 29 by a pair of expansion springs 33 engaged between the leading-edge side of the workpiece 10 and the handle receive unit 22. More specifically, the bottom end of each spring 33 is shown as being disposed within a shallow well 34 formed in the workpiece 10 and the upper end of each spring is shown in spring biased engagement against the underside of a respectively associated diagonal piece 30 of handle receiver 22.

Opposite terminals of arcuate cam 29 are defined by stop-lugs 36a and 36b to limit the extent of rotary cam movement relative to the cam follower in either direction. Additionally, arcuate cam 29 is formed with a plurality of intermediate spaced notches 40 frictionally engageable with a lug or detent 41 mounted on cam follower 32. The purpose of the interlocking notch and detent arrangement 40-41 is to provide a number of preselected positions or points of adjustment between the cam and cam follower which function to maintain the parts against relative displacement during normal use or troweling movements of the tool.

The handle unit heretofore indicated generally at 26 preferably comprises telescopic sections of lightweight metal tubing indicated at 36 and 37, for example. The upper end of the larger tubular section 36 may be formed with a conventional split tapered thread 38, which can be alternately clamped and unclamped against the telescoping smaller diameter tubular section 37 through appropriate tightening and untightening of sleeve nut 39 formed with an internal tapered thread complementary to tapered threads 38. Each of the tubular sections 36 and 37 may be made approximately 12 feet in length to permit the telescoping handle sections to be extended from a minimum telescoped length of a little over 12 feet to a maximum extended length of a little under 24 feet.

Axial movement of the handle within handle receiver 22 is limited by a plug 41 having an enlarged head 41a inserted in the lower end of handle section 36. The head portion of the plug bears against outer apertured flange 24b and prevents axial movement of the handle rearwardly relative to the receiver unit 22. The cam 29 is pinned to the handle in bearing engagement against end flange 24a and consequently prevents forward axial movement of the handle relative to the receiver unit 22.

In order to prevent warpage or bowing of the wood float 13 either transversely or longitudinally, I provide transverse stiffening bars 43 screwed directly into the float adjacent its opposite ends, in conjunction with longitudinally extending brace rods 44. The brace rods are secured at their inner ends 45 to L-shaped members 27 of the handle receiver 22 and at their outer ends 46 to stiffening bars 43. More specifically, the stiffening bars 43 are provided with through-going sockets or apertures to accommodate the outer threaded ends of associated rods 44. The outer threaded ends of each rod may be securely adjustably secured to its associated apertured stiffening bar 43 by a pair of adjusting nuts 47 and 47a.

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Through adjustment of the nuts 47-47a, tension on the longitudinal braces can be selectively regulated to prevent the wood float from bowing or warping along one major axis of the float, and, as above indicated, the transverse stiffening bars 43 prevent the wood float from warping along its second major axis.

In operation, the telescopic handle 26 may be adjusted to desired length according to the distance away from the work from which a workman must operate. Generally speaking, when the workman is able to work using an effective handle length not exceeding 12 to 14 feet, the tool may be operated in conventional fashion without having to vary the angular tilt of the workpiece 10 through operation of the cam 29. Where, however, it is necessary to utilize longer effective handle lengths approaching 14 to 24 feet, it is generally easier and desirable for the workman to vary the relative tilt of the workpiece to facilitate troweling without having to operate the device with his arms over his head, and in such manner as to reduce or eliminate the possibility of the trailing edge of the workpiece from embedding or plowing into the wet concrete during a back-stroke. More specifically, and as above indicated, the relative angle of tilt between the troweling undersurface 11 of the workpiece and the longitudinal axis of the handle may be selectively varied by axially rotating the handle clockwise or counterclockwise. As shown particularly in Fig. 4, when the handle is rotated in a clockwise direction (viewed from the rear) where stop lug 33b engages cam follower 32 the rearward or trailing edge 13 of the workpiece will be raised upwardly under influence of expansion springs 33 to a point whereat the flat planing surface of the workpiece and the handle axis are in substantial parallelism. By the same token, when the handle is rotated to its further extent in a counterclockwise direction and to a point whereat stop-lug 36a abuts against the cam follower 32, the angle between the workpiece and handle axis approaches 10° as shown in Fig. 1.

Figs. 1-4 have illustrated the embodiment of the invention with reference to a workpiece 10 in the form of a conventional rectangular wood float. Fig. 5 discloses the use of a conventional flat metal trowel workpiece 100. It is observed that the metal piece 100 can be mounted in substantially identical fashion by countersunk machine screws 118 to the lateral lugs or ears 17 of the workpiece frame 14. It is contemplated that other types of workpieces might be utilized in lieu of either the wood float 10 or metal trowel 100. Accordingly, the term "trowel-type workpiece" as used herein and in the claims is meant to designate and refer to wood floats, metal trowels and other equivalent workpieces used to level, smooth or otherwise work concrete or similar material.

Although the present invention has been described in some detail by way of illustration and example, it is understood that certain changes and modifications may be practiced within the spirit of the invention as limited only by the scope of the claims appended hereto.

I claim:

1. A concrete working tool comprising: a workpiece frame; a substantially flat trowel type workpiece defining substantially parallel leading and trailing edges mounted to the underside of said workpiece frame; a handle receiver pivotally connected to said workpiece frame about a horizontal axis disposed substantially parallel to said leading and trailing edges; an elongate handle having its lower end rotatably mounted in said handle receiver; an arcuate cam rotatable with and mounted on said handle adjacent the lower end thereof; a cam follower disposed in the vertical plane of the axis of said handle and engageable by said cam carried by said workpiece frame to one side of said pivotal axis; spring means normally biasing said cam and cam follower into engagement; said last-named means, said cam, and cam follower cooperable upon rotation of said handle and said cam mounted there-

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on to cause relative tilting between the leading and trailing edges of said workpiece.

2. The combination of claim 1 and wherein opposite end extremities of said cam are defined by stop-lugs engageable with said cam follower to limit the maximum amount of rotation of said cam in either direction; said cam also formed with a plurality of intermediate spaced notches releasably engageable with said cam follower; said intermediate notches and cam follower cooperable to releasably lock said cam and cam follower against relative rotational movement in a plurality of preselected positions.

3. The combination of claim 1 and wherein said cam

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is formed with a series of arcuately spaced notches each engageable with said cam follower to releasably lock said cam and cam follower in a plurality of adjusted positions.

References Cited in the file of this patent

UNITED STATES PATENTS

1,083,099	Howg -----	Dec. 30, 1913
1,590,310	Abram -----	June 29, 1926
1,713,513	Abram -----	May 21, 1929
2,594,331	McCrery -----	Apr. 29, 1952