Oct. 19, 1926. 1,603,821

D. M. WATTERS

BODY LEVELING DEVICE

Filed Feb. 16, 1922 2 Sheets-Sheet 1

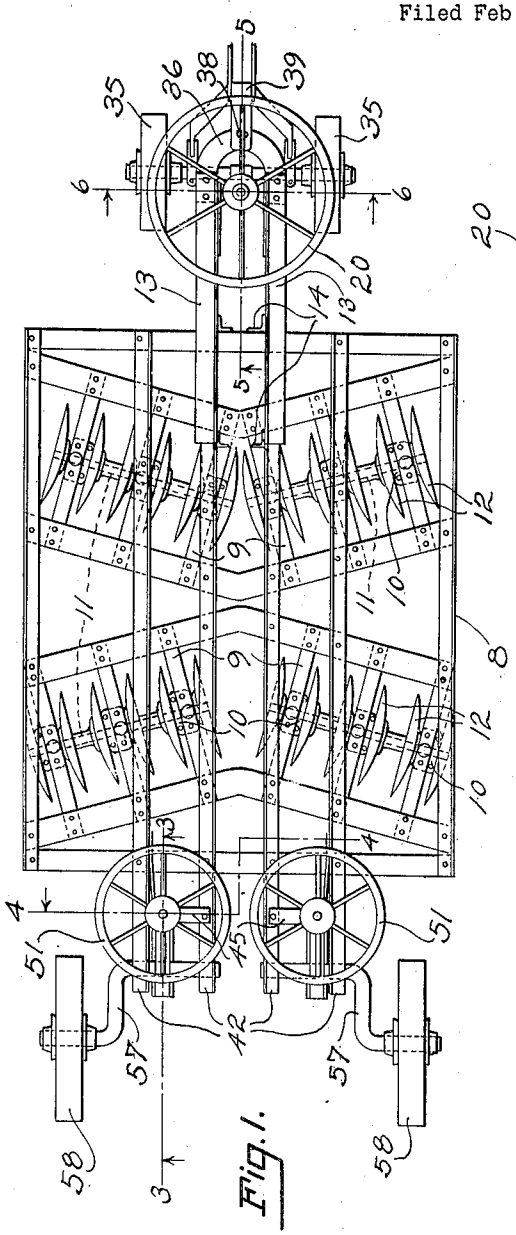


Fig. 1.

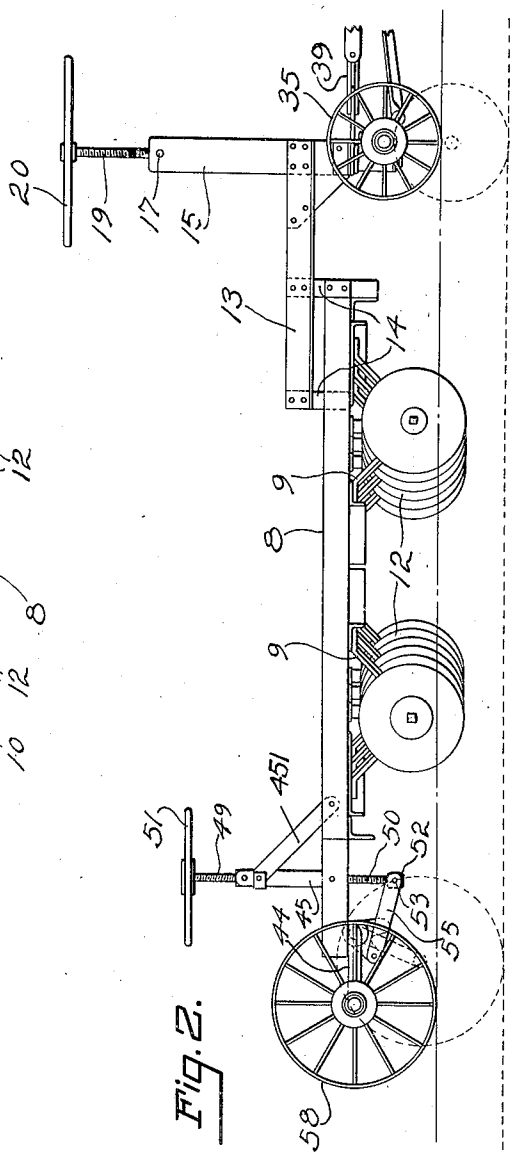


Fig. 2.

Inventor
DANIEL M. WATTERS
Lyon & Lyon
Attorneys

Oct. 19, 1926. 1,603,821

D. M. WATTERS

BODY LEVELING DEVICE

Filed Feb. 16, 1922 2 Sheets-Sheet 2

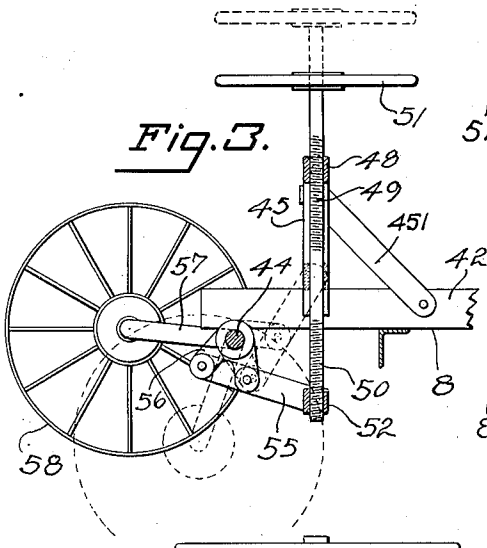


Fig. 3.

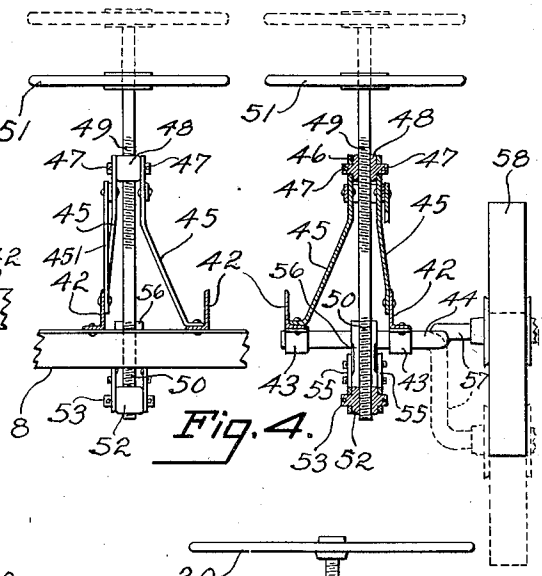


Fig. 4.

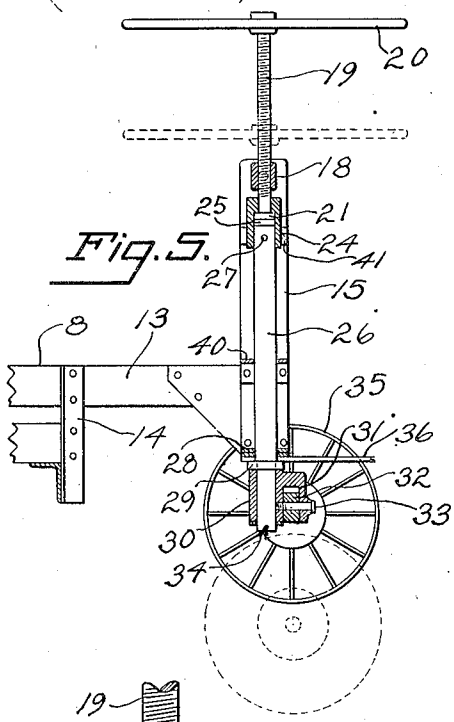


Fig. 5.

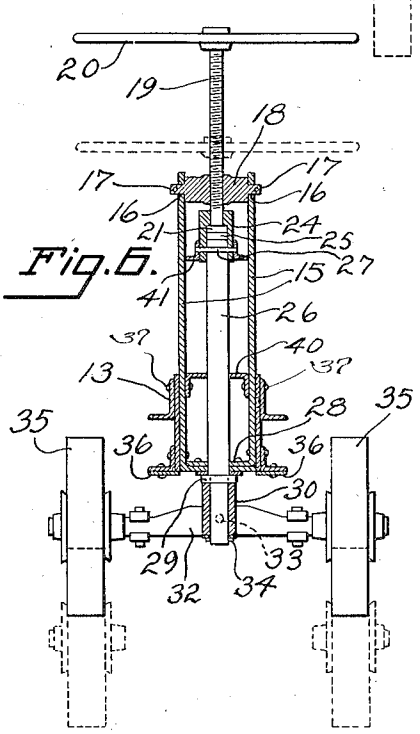


Fig. 6.

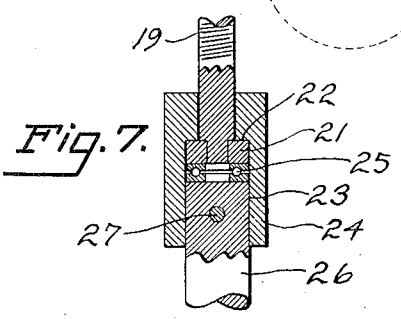


Fig. 7.

Inventor
DANIEL M. WATTERS
Lyon & Lyon
Attorneys

Patented Oct. 19, 1926. 1,603,821

UNITED STATES PATENT OFFICE.

DANIEL M. WATTERS, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THE KILLEFER MANUFACTURING COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

BODY-LEVELING DEVICE.

Application filed February 16, 1922. Serial No. 537,111.

This invention relates to a road tool of the character employed in the so called scarifying of roads provided with surfaces treated with oil, asphaltum or other substance that can be cut.

An object of the invention is to provide a tool of this description in which the cutting discs can be manually raised and lowered very quickly so as to avoid manholes, rails and other obstacles encountered in road building and repairing.

In order to properly scarify a road surface, that is to cut off the ridges of the surface so as to make said surface more nearly smooth, it is necessary to make frequent small adjustments of the discs relative to the road surface so as to more or less follow the surface contour, as the road may be crowned or there may be comparatively large uneven surfaces which it is not the function of the scarifier to remove. It is also essential, for the reasons stated above, that it be possible to adjust the discs relative to the road surface by relatively great movements quickly executed.

A further object of this invention is to meet the conditions noted above.

The accompanying drawings illustrate the invention:

Fig. 1 is a plan view of a road tool constructed in accordance with the provisions of this invention.

Fig. 2 is a side elevation of Figure 1. The parts are shown in solid lines in the positions they occupy when the frame is lowered relative to the wheels, and broken lines indicate the positions of the parts when the frame and its suspended discs are in raised position relative to the wheels.

Fig. 3 is an enlarged fragmental elevation mainly in section on line indicated by 3—3, Fig. 1.

Fig. 4 is an enlarged broken elevation, mainly in section on the irregular line indicated by 4—4, Fig. 1.

Figs. 5 and 6 are enlarged elevations, mainly in section on lines indicated by 5—5, and 6—6, respectively, Fig. 1.

In Figs. 3 to 6, the parts are shown in the frame lowered position in solid lines and broken lines indicate the parts in the frame raised position.

Fig. 7 is a sectional detail of the adjusting screw coupling in Fig. 5.

The frame of the implement is indicated at 8 and said frame carries hangers 9 provided with bearings 10 for the shafts 11, on which discs 12 are mounted. The discs 12 are shown in four series, in this instance, there being one series on each shaft. The discs of the series on opposite sides of the frame are arranged at an angle to one another as is customary in this type of road tool. At its forward end the frame 8 is provided with forwardly projecting arms 13 positioned above the level of the frame 8 and connected therewith by standards 14. The arms are mounted cantileverwise on the standards. To the forward ends of the members 13 is secured a post comprising a pair of spaced plates 15. Near their upper ends the plates 15 provide bearings 16 for the trunnions 17 of a trunnion nut 18 which engages a screw 19 provided with a hand wheel 20 for operating the screw.

The screw 19 is provided at its lower end with a head 21 which seats against a shoulder 22 Fig. 7 within a recess 23 of a coupling 24. The head 21 seats upon an antifriction bearing 25 which is supported by the upper end of a spindle 26 secured in the recess 23 of the coupling by a transverse pin 27. The spindle 26 passes through a bearing 28 in the lower end of the post 15, and is provided with a collar 29 below the bearing 28.

Below the collar 29 the spindle 26 is journaled in a block 30 which is provided with a transverse slot 31 to receive an axle 32. A bolt 33 in the block 30 passes horizontally through the axle 32 to prevent relative endwise movement between the axle and block. The bolt 33 thus pivotally connects the axle 32 to the block so that said axle can swing in a vertical path, and the block 30 is adapted to turn in a horizontal path about the spindle 26. Thus the spindle and the axle are universally connected. A pin 34 extends transversely through the lower end of the spindle 26 and prevents separation of the spindle and block 30. The end portions of the axle 32 are provided with wheels 35. A yoke 36 is riveted at 37 to the members 13 and pivoted to the yoke at 38 is a draft tongue 39 whereby the road tool is drawn over the surface which is being operated upon.

Secured to the inner faces of the plates 15

is a member 40 which engages the opposite sides of the spindle 26 to prevent lateral movement of said spindle, and secured to the coupling 24 are guides 41 adapted to engage the inner faces of the plates 15 which function the same as the members 40.

If the screw and spindle should become slightly bent in use, the screw would still be operative to produce raising and lowering of the front end of the frame 10 relative to the wheels 35, because of the provision of the trunnion nut.

The frame 8 comprises longitudinally extending members 42 of which, in this instance, there are six, and the standards 14 are mounted on the two intermediate ones. Four of the frame members 42 are extended rearwardly and are provided with bearings 43 for crank axles 44, there being two bearings for each axle and two axles, one for each side of the machine. Mounted on each pair of the members 42 somewhat forwardly of the bearings 43 is a post comprising plates 45, 451. The upper ends of the plates 45 constitute bearings 46 for the trunnions 47 of a trunnion nut 48. The trunnion nut 48 is engaged by a screw provided with two sets of screw-threads 49, 50 respectively. The screw threads 49 are the reverse of the screw threads 50. The upper end of the screw is provided with a hand wheel 51 whereby the screw is turned.

The screw-threads 50 engage a second trunnion nut 52 having its trunnions 53 pivotally supporting one end of a pair of arms 55 which are secured by a V-shaped bracket 56 to the crank 57 of one of the crank axles. Each of the crank axles is provided with a ground wheel 58, and the rear end of the frame 10 is thus independently and adjustably suspended at opposite sides of the longitudinal center line of the machine. This together with the mechanism described above for adjustably supporting the forward end of the frame constitutes a three point suspension for the frame. The mechanism described for operating the crank 57 is provided for each of the cranks, that for operating one being a duplicate of the other and, therefore, but one has been described. The arms 55 and crank arm 57 together constitute a lever of which the fulcrum is the hub of the wheel 58.

The operation of the tool described above is as follows:

Assuming that power is applied to the tongue 39 to draw the tool over the surface of a road that is to be repaired, the hand wheels 20, 51, will be operated to lower the frame relative to the ground wheels 34, 58 so that the discs 12 will cut into the surface of the ridges in the road and thus level off said ridges. In the drawings the screw threads of the screw 19 are right hand and therefore to raise the discs the hand wheel 20 will be turned to the right. While it is necessary to adjust the elevation of both ends of the frame 10 at intervals to produce the desired cutting of the road surface, shifting of the front end need not be so speedily effected as the rear end. By raising and lowering the rear end of the frame, not only will the rearmost discs be raised and lowered, but the foremost discs will likewise be raised and lowered, though by a lesser distance than the rear end. Assuming that the hand wheels 20, 51, have been adjusted to make the desired cut into the ridges or uneven places of the road, and that because of the approach of the machine toward a man hole it is necessary to raise the discs above the surface of the road, the operator will turn both hand wheels 51 to the right. The screw threads 49 being left hand, the screws will rise relative to the frame so as to swing the arms 55 and cranks 57 upwardly to raise the frame. Turning of the hand wheels 51 also causes the trunnion nuts 52 to travel upwardly on the screws, because the screw-threads 50 engaged by them are right hand. This of course produces more rapid swinging upwardly of the arms 55 and cranks 57 to effect the raising of the frame. As soon as the man hole has been passed, the hand wheels 51 will be turned to the left to effect lowering of the frame so as to again swing the discs 12 into cutting relation with the surface of the road.

The operator, by carefully observing the depth of cut made by the forward series of discs, can accurately operate either or both of the hand wheels 51 to make a deeper cut with the rear series of discs in that portion of the ridge which has just passed the forward series of discs, so as to reduce the elevation of the ridges by a still greater amount.

These tools are of necessity relatively massive in construction and it is clear, therefore, that the frame elevating mechanisms should operate easily and quickly to avoid the imposing of excessive strain upon the operators, since frequent raising of the discs is necessary to clear road obstructions such as man holes and because of working on comparatively short stretches of road and also in cross leveling for adjusting to road inequalities.

Because of the provision of the members 13 and standards 14, the front axle can be turned to position at a right angle to the longitudinal axis of the machine, thus permitting the machine to be turned in a short radius and consequently not requiring that the discs be raised ten or twelve inches as would be necessary if a short turn could not be made. This is important since the machines operate about three-quarters of the time on runs of but one or two blocks before turning.

It will be understood that a machine of this description is subjected to considerable vibration when in service. By provision of the raising and lowering mechanism described, the vibrations do not destroy the adjustment as has been experienced with the use of prior constructed lifting jacks designed for speedy raising and lowering of the discs.

Ease of operation of the front screw 19 is insured by reason of applying the pressure of said screw vertically through the point of support and receiving the thrust of the screw upon an anti-friction thrust bearing.

I claim:

1. An implement of the class described, comprising a frame, a post connected with the frame, a nut supported by the post, a coupling in the post, a screw engaging the nut and rotatively engaging the coupling, a spindle positioned partly in the post, a pin pivotally connecting the spindle and coupling, an axle, a block connected with the spindle and having a transverse slot receiving the axle, and a horizontal pivot extending through the block and axle.

2. An implement of the class described, comprising a frame, a post connected with the frame, a nut supported by the post, a coupling in the post, guides secured to the coupling and engaging the post, a screw engaging the nut and rotatably engaging the coupling, a spindle positioned partly in the post, a pin pivotally connecting the spindle and coupling, an axle, and a universal connection between the spindle and axle.

3. In an implement of the character described, the combination of a frame, a post connected with the frame and provided with a trunnion nut, a screw engaging the trunnion nut, a spindle, a coupling connecting the spindle and screw and having a thrust bearing for the screw, the coupling being pivoted to the spindle, an axle universally connected with the spindle, wheels for the axle, and means to turn the screw.

4. An implement of the class described, comprising a frame, a post connected with the frame, a nut supported by the post, a screw engaging the nut, a spindle, means connecting the screw and spindle and permitting relative rocking and rotation between the screw and the spindle, guides for said means engaging the post, a block rotatably mounted on the spindle, and an axle pivotally connected with the block.

Signed at Los Angeles, California this 3d day of February 1922.

DANIEL M. WATTERS.