Dec. 31, 1929. J. W. HELTZEL 1,741,459

ROAD SCREED

Filed Sept. 17, 1927 2 Sheets-Sheet 1

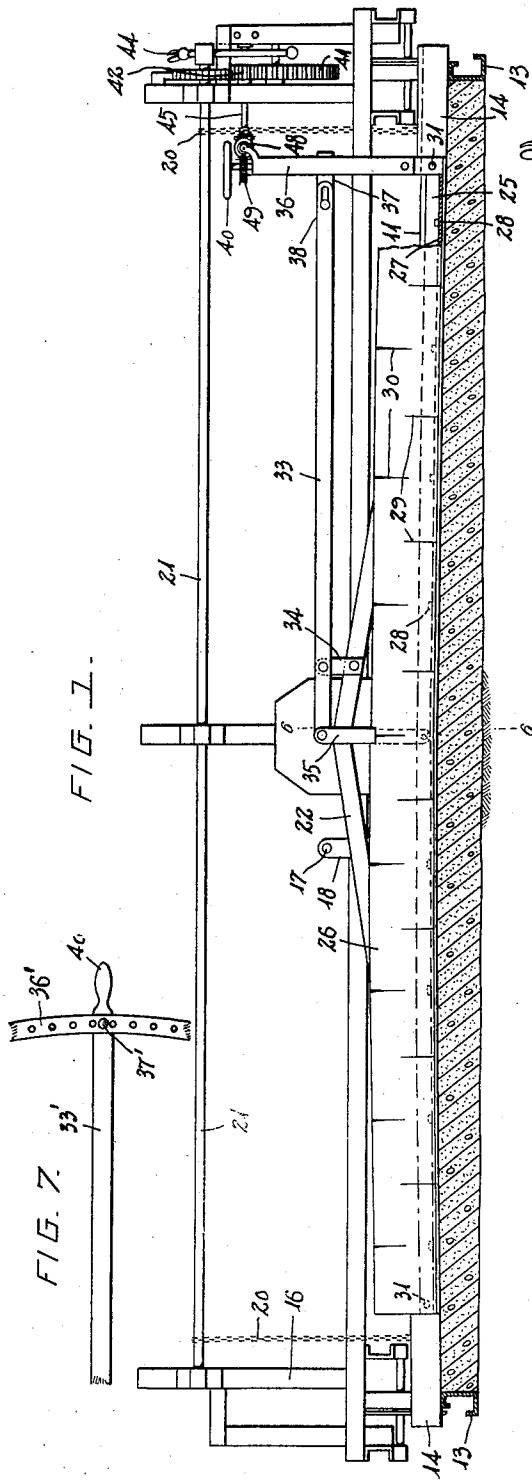


FIG. 1.

FIG. 7.

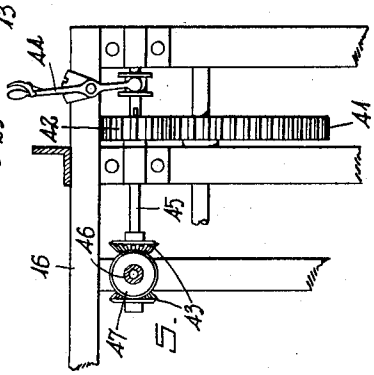


FIG. 5.

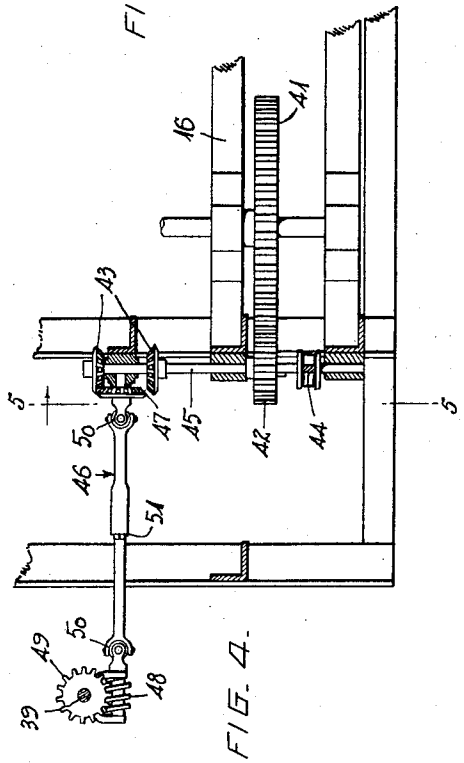


FIG. 4.

Inventor:

J. W. Heltzel

By Monroe E. Miller

Attorney.

Dec. 31, 1929. J. W. HELTZEL 1,741,459

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Filed Sept. 17, 1927 2 Sheets-Sheet 2

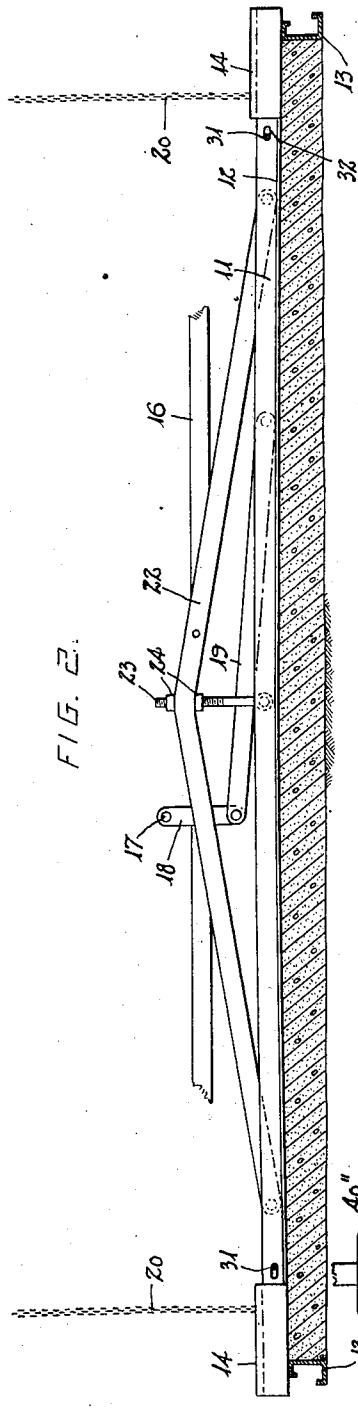


FIG. 2.

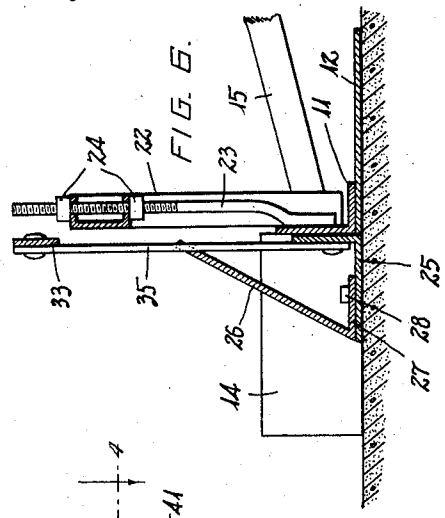


FIG. 6.

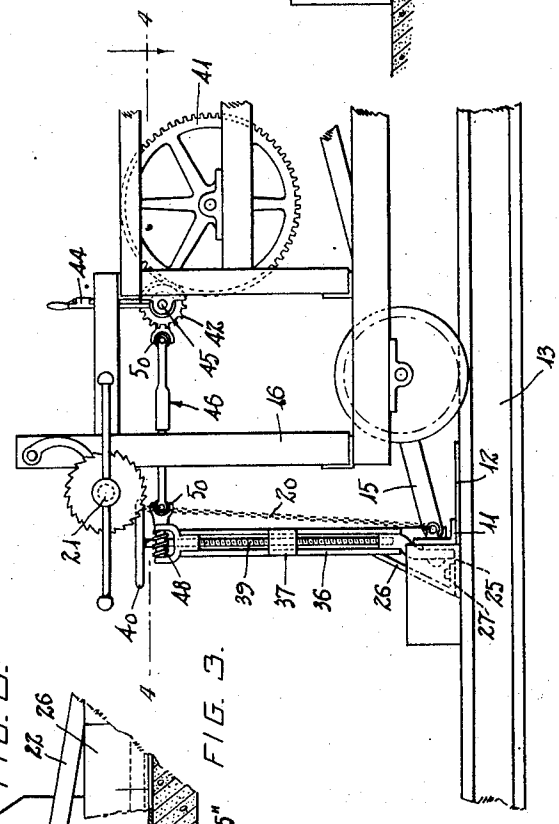


FIG. 3.

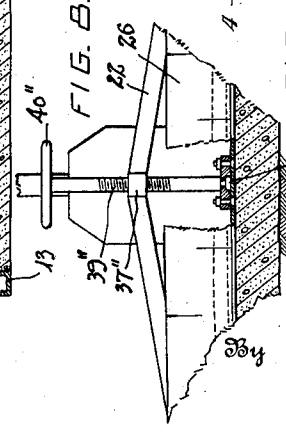


FIG. 8.

Inventor:

J. W. Heltzel

By Monroe E. Miller

Attorney.

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UNITED STATES PATENT OFFICE

JOSEPH WILLIAM HELTZEL, OF WARREN, OHIO

ROAD SCREED

Application filed September 17, 1927. Serial No. 220,264.

The present invention relates to concrete road finishers or machines which are employed for finishing off the surface of a concrete road under construction, and the invention has for an object the provision of a novel and improved screeding or strike off device by means of which the surface of the road may be formed with a crown of desired magnitude or may be made flat such as at turns or bends in the road.

Another object of the invention is the provision in a finishing machine of a main screed or strikeoff which is adapted to give the surface of the road the desired crown, in combination with a secondary screed or strikeoff that is adjustable for gradually decreasing the crown until the surface of the road is flat and then gradually restoring the crown, as the machine approaches and moves away from a bend or turn in the road. It is the practice to crown the road or to have the surface thereof convexed transversely when the road is straight or substantially straight and to have the surface flat at curves or turns in the road, with the road inclined transversely and higher at the outer edge of the curve than at the inner edge, so that the utility of the present invention will be apparent.

Another object is the provision of a secondary screed of novel construction to be assembled with a main screed for adjustment to decrease the crown of the road until the surface of the road is flat, and vice versa, and another object is the provision of novel means for conveniently adjusting the secondary screed.

With the foregoing and other objects in view, which will be apparent as the description proceeds, the invention resides in the construction and arrangement of parts, as hereinafter described and claimed, it being understood that changes can be made within the scope of what is claimed, without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a front view of a concrete road finisher having the improvements incorporated therein, a portion of the secondary screed being broken away, and parts in rear being omitted for sake of clearness.

Fig. 2 is a front view of the main screed, with the secondary screed removed.

Fig. 3 is a fragmentary side elevation of the finishing machine on an enlarged scale.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 3 on an enlarged scale.

Fig. 5 is a section on the line 5—5 of Fig. 4.

Fig. 6 is an enlarged section on the line 6—6 of Fig. 1 through the main and secondary screeds.

Fig. 7 is a fragmentary elevation of the lever for flexing the secondary screed, showing modifications.

Fig. 8 is a fragmentary view illustrating another modification in the control of the secondary screed.

The main screed or strikeoff comprises an angle iron 11 with a forward upstanding flange and a lower rearwardly extending flange, and a plate 12 of suitable width on which the lower flange of the angle iron is riveted, welded, or otherwise secured adjacent to the forward edge of said plate. The angle iron and plate are of a length greater than the width of the road, so that the plate 12 of the screed is slidable on the side rails or forms 13 which define the sides or edges of the road under construction. Deflectors 14 are secured to the end portions of the angle iron 11 above the rails 13 for deflecting the material inwardly.

Links 15 loosely connected with the frame or carriage 16 of the machine, are connected loosely at their forward ends with the angle iron 11, so as to push the screed forwardly, and also permit said screed to be reciprocated longitudinally of itself transversely of the road. The screed is reciprocated by means of a rock shaft 17 having an arm 18 connected by a link 19 with the screed, and the screed may be lifted off the road by means of chains or flexible elements 20 connected to the screed and to a transverse shaft 21 mounted on the carriage or frame 16 for winding the chains thereon.

The main screed above described is adjustable, being resilient so that it may be bowed or sprung upwardly intermediate its ends.

In order to adjust the screed to the desired crown of the road, a truss 22 is secured at its ends to the angle iron 11 near opposite ends thereof, and an adjusting bolt or stay 23 is connected to the central portion of the screed and passes upwardly slidably through the central portion of the truss 22, and nuts 24 are threaded on said bolt above and below the truss. By adjusting the nuts 24 the central portion of the screed may be raised and lowered to bend or bow the screed to the desired crown or curvature.

The secondary screed or strikeoff is adapted for attachment to and removal from the main screed, being a separate and distinct unit although when assembled with the main screed the two screeds cooperate one with the other. The secondary screed comprises an angle iron 25 having a rear upstanding flange and a lower forwardly extending flange. The rear flange bears rearwardly against the upstanding flange of the angle iron 11, as seen in Fig. 6. The secondary screed also includes a rearwardly inclined upwardly extending plate 26 having a rearwardly extending flange 27 at its lower edge secured on the lower flange of the angle iron 25 by means of bolts 28, rivets or other securing elements. The angle iron 25 and plate 26 are resilient so as to be capable of being sprung or bowed. The plate 26 being inclined rearwardly will facilitate the springing of said plate, and to further facilitate springing of said plate it may be formed with slits 29 and 30, as seen in Fig. 1. The slits 29 extend upwardly from the lower edge of the plate 26 and through the flange 27, while the slits 30 extend downwardly from the upper edge of the plate, said slits being in staggered arrangement. When the plate 26 is sprung upwardly between its ends the upper slits 30 open slightly and the lower slits 29 close, while the lower slits 29 open slightly and the upper slits 30 close when the secondary screed is straightened out.

The secondary screed is disposed in front of the main screed between the deflectors 14, and the plate 26 will serve as a baffle to prevent the aggregate in front of the screeds from passing over the screeds.

In order to attach the secondary screed to the main screed, bolts 31 or other securing elements are carried by the angle iron 25 near the ends thereof and pass through horizontal slots 32 in the angle iron 11 of the main screed, thereby permitting the secondary screed to be sprung without interference.

The means for adjusting the secondary screed includes a lever 33 extending from the fender of the machine to one side thereof and fulcrumed on a bracket 34 bolted or otherwise secured to the truss 22 of the main screed. Said lever has a short inner arm connected by a link 35 with the angle iron 25, whereby the long arm of the lever may be adjusted upwardly and downwardly for bowing or straightening out the secondary screed with considerable leverage.

In order to conveniently adjust the lever 33, a slotted post 36 is secured to the angle iron 25 at one end thereof, and a nut 37 is slidable vertically in said post and has a pin and slot connection 38 or other suitable connection with the lever 33. The nut 37 engages a vertical screw 39 mounted in the post 36, and said screw has a hand wheel 40 at its upper end whereby the screw may be conveniently rotated to raise and lower the nut 27 and long arm of the lever 33.

When the machine is operating along a straight or substantially straight stretch of road, the secondary screed may be bowed or sprung upwardly so that its lower surface (lower surface of the bottom flange of the angle iron 25) is flush with the lower surface of the plate 12, in order that the secondary screed will cooperate with the main screed for crowning the surface of the road, although if desired the secondary screed may be sprung higher than the plate 12. When the machine is approaching a curve or bend in the road, the hand wheel 40 may be turned slowly or at intervals so as to gradually raise the long arm of the lever 33 and depress the link 35 and intermediate portion of the secondary screed, in order that the crown of the road will be gradually reduced and eliminated until the secondary screed is straight to produce a flat surface in the road at the bend or turn, and as the machine moves away from the bend or turn the hand wheel 40 may be rotated in the opposite direction to gradually spring the secondary screed upwardly and thereby restore the crown. It is thus possible to manually adjust or set the secondary screed to reduce and eliminate the crown and then gradually restore the same, for predetermined distances.

The adjustment of the secondary screen may also be accomplished automatically from a gear wheel 41 or other wheel or member which is rotatable with the propelling mechanism of the machine. The gear wheel 41 may be a part of the gearing which propels the machine, so that the wheel 41 rotates in accordance with the movement of the machine on the side rails. Therefore, by operably connecting the wheel 41 and screw 39, the secondary screed may be adjusted in ratio to the distance of movement of the screed. As shown, a pinion 42 meshes with the gear wheel 41, and a shaft 45 is slidable through said pinion and is rotated therewith. A hand lever 44 is provided for sliding the shaft, and a pair of bevel gears 43 are secured on said shaft 45 to mesh alternately with a bevel gear 47 secured on a flexible shaft 46 which has a worm 48 carried by the post 36 and meshing with a worm wheel 49 secured on the screw 39 below the hand

wheel 40. The shaft 46 has universal joints 50 and a telescopic joint 51 to permit of flexibility, so that the screw 39 may reciprocate with the screeds without disturbing the operative connection. By moving the hand lever 44 either bevel gear 43 may be brought into mesh with the bevel gear 47, so that the screw 39 may be rotated in either direction for raising or lowering the long arm of the lever 33. It is thus possible to gradually straighten out and then bow the secondary screed through predetermined distances of movement of the machine when approaching and leaving a bend or turn in the road without requiring manual adjustment, other than the making and breaking of the connections between the driving member of the machine and the screw 39. If manual adjustment is desired the worm 48 or worm wheel 49 may be loosened so as not to interfere with the rotation of the screw 39 by the hand wheel 40.

The screeds are made of metal, and the main screed is fairly rigid, so as to be substantial when sprung to different curvatures, while the secondary screed is more freely bendable to be quickly bent from full-crown to straight position and vice versa.

In some cases the secondary or front screed may be bowed slightly higher than the rear or main screed, so that the intermediate portion thereof is one-eighth of an inch (more or less) higher than the intermediate portion of the main screed. The front or secondary screed will then finish the surface slightly higher than intended, and the main screed following will finish off the surface to the desired crown, and the material or aggregate will be smoothed out so as to eliminate all voids and thus produce a smoother surface or finish.

Fig. 7 shows the lever 33′ corresponding with the lever 33 above described, projecting through the post 36′ and provided with a handle 40′ for swinging said lever, and the lever may be held in various positions by means of a pin 37′ inserted through apertures in the lever and post, whereby the secondary screed may be maintained in different flexed positions. By swinging the lever the secondary screed may be bent upwardly and downwardly, and the lever may be changed by removing and inserting the pin 37′ as the machine moves predetermined distances.

Fig. 8 illustrates another modification in the means for controlling the secondary screed. Thus, a nut 37″ is carried by the truss 22 of the main screed, and a vertical screw 39″ is threaded through said nut and has a hand wheel 40″ at its upper end for conveniently rotating said screw. The lower end of the screw has a swivel connection 35″ with the secondary screed, in order that the secondary screed may be conveniently bent upwardly and downwardly, said screw being located at the center of the machine.

Having thus described the invention, what is claimed as new is:—

1. A secondary screed comprising an angle iron having a rear upstanding flange for attachment to the main screed of a concrete road finishing machine and having a lower forwardly extending flange, and an upwardly extending plate secured on said lower flange.

2. A concrete road finishing machine including a member operable in the propelling of the machine, an adjustable screed, and an operative connection between said screed and member for adjusting the screed as the machine is moved.

3. A concrete road finishing machine having a member movable as the machine is propelled, a main screed, a secondary adjustable screed movable from crown to straight position and vice versa, and an operative connection between the secondary screed and said member for adjusting the secondary screed in either direction in the movement of the machine.

4. A concrete road finishing machine having a member operable by the propelling of the machine, a main screed, a secondary screed having its end portions connected with the main screed, and an operative connection between the intermediate portion of the secondary screed and said member for springing the secondary screed either upwardly or downwardly by the movement of the machine.

5. A screed including an upwardly extending sheet metal plate having slits extending from its upper and lower edges and in staggered arrangement.

In testimony whereof I hereunto affix my signature.

JOSEPH WILLIAM HELTZEL.