April 7, 1925. 1,532,841

R. W. STAYTON ET AL

SUBGRADER

Filed Oct. 23, 1924 2 Sheets-Sheet 1

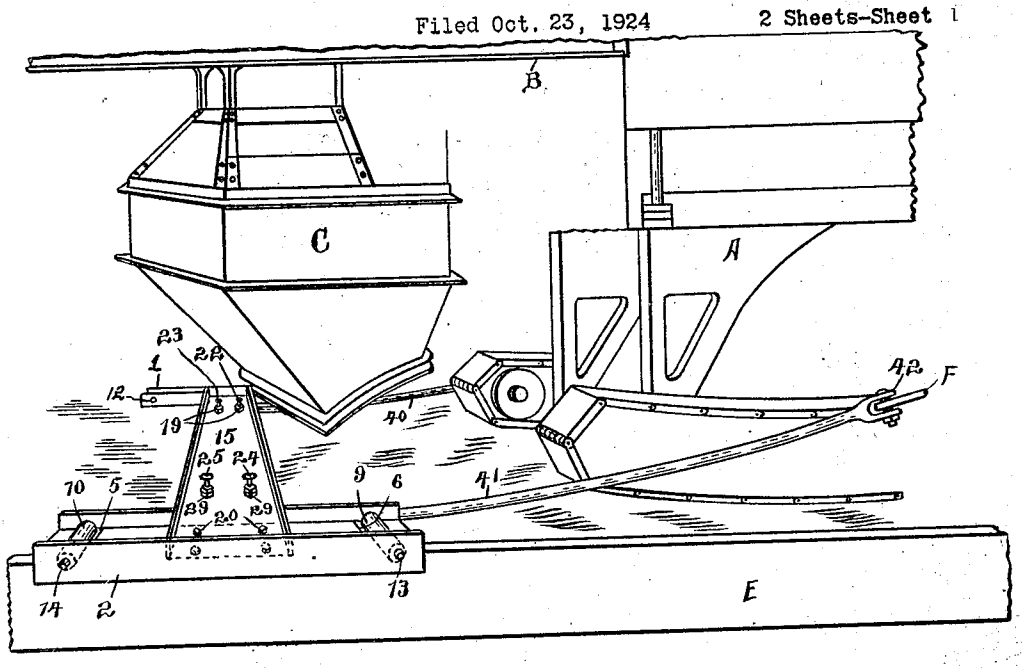


Fig. 1.

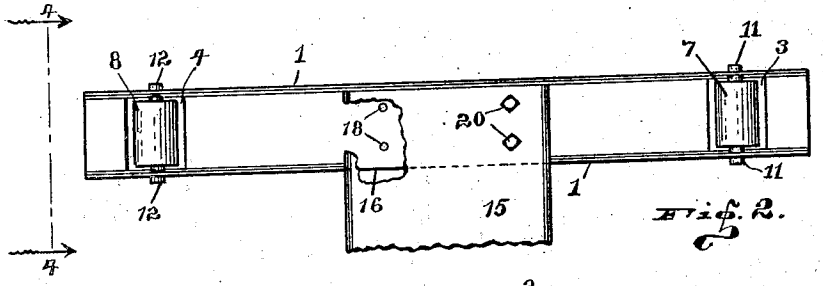


Fig. 2.

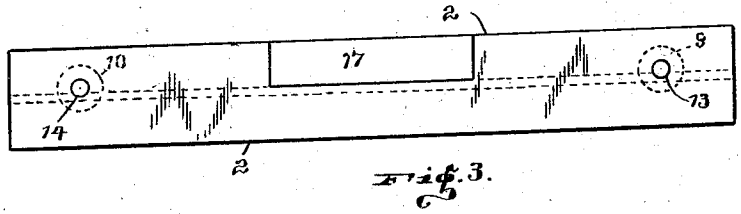


Fig. 3.

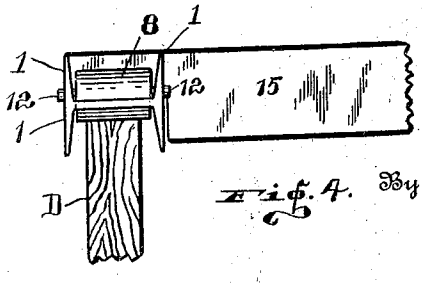


Fig. 4.

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SUBGRADER

Filed Oct. 23, 1924 2 Sheets-Sheet 2

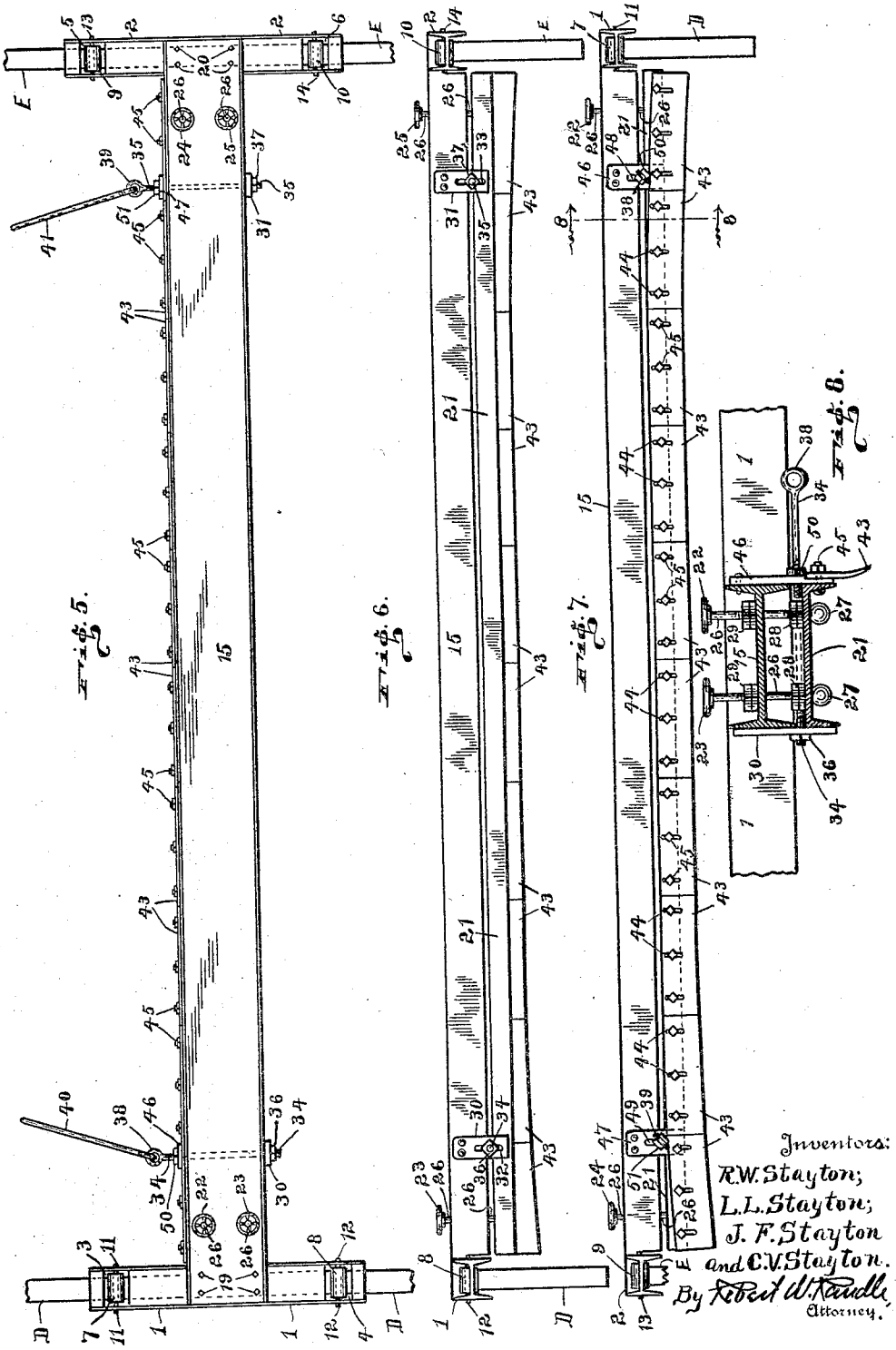


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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UNITED STATES PATENT OFFICE.

ROBERT W. STAYTON, LEONARD L. STAYTON, JAMES F. STAYTON, AND CHARLES V. STAYTON, OF ELDORADO, OHIO.

SUBGRADER.

Application filed October 23, 1924. Serial No. 745,335.

To all whom it may concern:

Be it known that we, ROBERT W. STAYTON, LEONARD L. STAYTON, JAMES F. STAYTON, and CHARLES V. STAYTON, all citizens of the United States, residing in the town of Eldorado, in the county of Preble, State of Ohio, have invented a new and useful Subgrader, of which the following is a full, clear, and comprehensive specification and exposition, the same being such as will enable others to construct and use the same with absolute exactitude.

The object of our present invention, broadly speaking, is to provde a sub-grader, to be used in hard-surfaced road-way construction, and for various purposes to which it is applicable, the same being strong and durable in construction, positive in its actions, easily operated and controlled, practically automatic in its operation, and which can be manufactured, sold, and operated at a comparatively low price.

In the building of concrete roadways it is important that the ground or material forming the base on which the plastic concrete is placed should be very smooth and level in order to attain the best results and that the concrete shall be of a uniform thickness throughout. This is accomplished by what we term "sub-grading," that is grading the base immediately prior to laying the concrete thereon and after the main grading has been done, therefore, to attain these results, and with a minimum of expense, is the primal object of our invention.

Other objects and particular advantages of our invention will suggest themselves in the course of the following description, and that which is new will be correlated in the appended claims.

One manner of carrying out the principles of our invention in a practical and efficient way is shown in the accompanying two-sheets of drawing, in which—Figure 1 is a perspective side view of our device, showing the same in connection with a portion of a concrete mixing machine. Figure 2 is a top plan view of one of the end carriages forming part of our device. Figure 3 is a side elevation of one of the carriages. Figure 4 is an end view of the carriages, as taken for instance from the line 4—4 of Fig. 2. Figure 5 is a top plan view of our entire device, as it would appear mounted on its tracks. Figure 6 is a rear elevation of our entire device. Figure 7 is a front elevation of our entire device. And Figure 8 is a cross section, as taken on the line 8—8 of Fig. 7.

Similar indices denote like parts throughout the several views.

In order that the construction, the operation, and the several advantages of our invention may be more fully understood and appreciated, we will now take up a detailed description thereof, in which we will set forth the same as comprehensively as we may.

It should first be understood that preparatory to building a concrete road the space to be occupied thereby is first graded, in the usual manner, after which the runners or marginal retainers are set up forming two spaced-apart lines which are spaced to the distance equal to the width of the proposed concrete roadway, with their upper edges leveled or conformed to the proper level of the proposed concrete roadway to be made. Of course the primal object of said retainers are for the purpose just stated, but we utilize them for tracks for our grading device, therefore hereinafter we will refer to them simply as "tracks."

In the drawings letter A denotes the rear portion of a concrete mixing machine. Extending back from the center of said machine is a substantially horizontal conveyor-bar B, which forms a track for the dump-bucket or conveyor proper, which is designated by letter C, and it is adapted to carry the mixed concrete in plastic form from the machine back to where it is dumped or deposited.

Letters D and E denote the marginal retainers, or tracks on which our device is adapted to travel, our device being adapted to be hitched to the machine A at any points where it may be drawn forward thereby when the machine is advancing. Our device is detachably connected to some portion of each side of the machine, as for instance to the plate or bar F, or otherwise most convenient.

The invention proper comprises two carriages, left and right, respectively, each consisting of a body member, 1 and 2, respectively. Each of said members 1 and 2 is I-shaped in cross-section, being formed of the usual I-beam construction material, consisting of a stem, with upper and lower

flanges on each side and at right-angles to the stem. Near each end of each of the members 1 and 2 the stem is cut away, forming substantially square or oblong apertures 3 and 4 in the member 1, and 5 and 6 in member 2. Located in said apertures are the respective rollers 7, 8, 9 and 10, each of said rollers being mounted on its respective axle 11, 12, 13 and 14.

The peripheries of said rollers extend below the stems of the members 1 and 2, and they are adapted to roll on the upper edge of the tracks D and E, with axles of said rollers mounted in the upwardly extending flanges of the members 1 and 2, whereby the under sides of the stems of the members 1 and 2 will be close to but not in contact with the surfaces of the tracks D and E.

We will now assume that the carriages are resting on their respective tracks D and E, as in Figs. 1 and 5; then said carriages are connected as follows: Numeral 15 denotes the main beam, which is also of I-beam shape in cross section, it is of the same dimensions as are the members 1 and 2, except that it is of approximately twice the width thereof. The end portions of the lower flanges of the beam 15 are cut away even with the stem thereof, the length of said cut-away portions being equal to the distance from the inner face of the flange of the members 1 and 2 to the outer edge of the opposite side of said members 1 and 2; and the central portions of the upper flanges of the members 1 and 2 are cut away forming notches 16 and 17, shown in Figs. 2 and 3, the length of said notches 16 and 17 being equal to the width of the beam 15. By the above it will be seen that the stem of the end portion of the beam 15 may rest flat on the stems of the members 1 and 2, as shown in Figs. 5, 6 and 7. Bolt apertures, as the apertures 18 shown in Fig. 2, are formed through the end portions of the beam 15 and the central portion of the members 1 and 2, with the apertures in the beam 15 registering with the respective apertures in the members 1 and 2. Each pair of apertures being adapted to receive a bolt therethrough, the bolts on the left being designated by numeral 19, and those on the right by numerals 20, as shown in Figs. 1 and 5, whereby the ends of the beam 15 are rigidly secured to the members 1 and 2, as shown, and said beam is thereby supported and carried therewith.

The scraper comprises the base member or drag 21, which is in the nature of an inverted channel iron in cross section, that is it is in the nature of a channel iron, having a stem with flanges extending downward from each edge thereof, as shown in Fig. 8. The drag member 21 is adjustable, up and down, and is continuously held in suspension as follows: Near each end of the member 21 (and the beam 15) are two adjusting devices, each having a manually operable wheel 22, 23, 24, and 25, and as the four adjusting devices are identical with each other we will simply describe one of them and the corresponding parts of the others will be denoted by like numerals. The wheel 22, for instance, is secured on the upper end of the threaded stem 26. Each of said stems 26 extend freely through corresponding apertures formed through the stem-portion of the beam 15 and the drag member 21, as shown in Fig. 8. Formed rigid with the lower ends of the stems 26 is a ball 27, which contacts with the underside of the stem of the drag 21. Threaded on the stem 26 and contacting with the upper side of the stem of the drag 21 is the double nuts 28. Also threaded on the stems 26 is the double nuts 29, which contact with the upper side of the stem of the beam 15.

From the above it will be apparent that the drag member 21 is retained in suspension below but not in contact with the beam 15, and that it may be adjusted up and down with relation thereto.

Secured at their upper ends to the rear face of the beam 15, and located near the ends thereof are the plates 30 and 31, which extend down over a portion of the rear face of the drag member 21. Vertical slots 32 and 33 are formed through the respective plates, 32 and 33, as shown in Fig. 6.

Numerals 34 and 35 denote draw-bars, which are located near each end of the device, and they extend between the members 15 and 21, with their rear ends extending through the respective slots 32 and 33, and with the respective nuts 36 and 37 on their rear ends to engage with the respective plates 30 and 31.

Secured at their upper ends to the front of the beam 15, and located near the ends thereof, are the plates 46 and 47, which extend down over a portion of the front face of the drag member 21. Vertical slots 48 and 49 are formed through the respective plates 46 and 47, as shown in Fig. 7.

Said draw-bars 34 and 35 also extend through the slots 48 and 49, with nuts 50 and 51, one the respective draw-bars to engage with the respective plates 46 and 47.

Eyes 38 and 39 are formed on the forward ends of the respective draw-bars, in which are hooked the rear ends of the respective pull-rods 40 and 41. The forward ends of said pull-rods are detachably secured to some convenient part of the machine A, as for instance by means of the clevis 42 connected to the plate F of the machine, as shown in Fig. 1.

Numeral 43 denotes blades, which are identical with each other, each of which has a plurality of slots formed in their upper portions and which extend at right-angles to the length of the blades. Each of said

slots is adapted to receive a bolt 54, which bolts also extend through corresponding apertures therefor in the forward flange of the drag member 21.

By reason of the slots 44 we are enabled to set the blades 43 either in a straight line or in a curve, as indicated, in order to correspond with the desired curvature to be given to the roadway.

The operation of our device will, no doubt, have been anticipated from the above description, from which it will be understood that our device is to be connected with and in the rear of the mixing machine A. Then as the machine A travels forward on the ground between the rails D and E our device will follow, traveling on said rails, and with the desired adjustment given to the drag member 21 and to the blades 43 it is evident that the ground or roadbed will be sub-graded immediately prior to depositing the mixed concrete thereon, which of course is always deposited on the roadway in the rear of our device and therefore on that part of the roadway which has just been operated upon by our device.

We desire that it be understood that various changes may be made in the several details herein set forth without departing from the spirit of the invention and without sacrificing any of the advantages thereof which are new and useful.

Having now fully shown and described our invention, what we claim and desire to secure by Letters Patent, is—

1. A sub-grader comprising two carriages spaced apart and having rollers adapted to revolve upon tracks which form the side walls of the proposed roadway, an I-beam with its end rigidly connected to said carriages and spanning the space therebetween, an inverted channel shaped drag member of same width as said beam and located therebelow and spaced therefrom, manually operable screws located near each of the four corners of said beam and extending through said drag member and adapted to hold the drag member in suspension and providing means whereby the drag member may be adjusted with relation to said beam, blades adjustably attached to the forward face of the drag member, and means whereby the device may be drawn forward.

2. In a grading device, the combination with a pair of tracks forming the margins for the roadway and a mixing machine to travel between said rails but without contact therewith; a pair of carriages each comprising a main member which is I-shaped in cross section, a pair of rollers extending across the end portions of each of the main members and adapted to revolve upon said tracks with the downwardly extending flanges of said main members located on each side of and parallel with said tracks; a single I-shaped beam interlocked at its ends and secured to said main members of the carriages, a channel-iron drag member of same width as said beam and located therebelow but without contact with said carriages, means for suspending said drag member from said beam with means whereby the drag member may be adjusted vertically, a draw-bar secured between said beam and the drag member, pull-rods connected to said draw-bars, and means for connecting the forward ends of the pull rods to said mixing machine.

In testimony whereof we have hereunto subscribed our names to this specification.

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JAMES F. STAYTON.
CHARLES V. STAYTON.