Nov. 24, 1931. J. E. WIGHT 1,833,546

SUBGRADE FINISHING MACHINE

Filed May 23, 1929 4 Sheets-Sheet 1

Fig. 1.

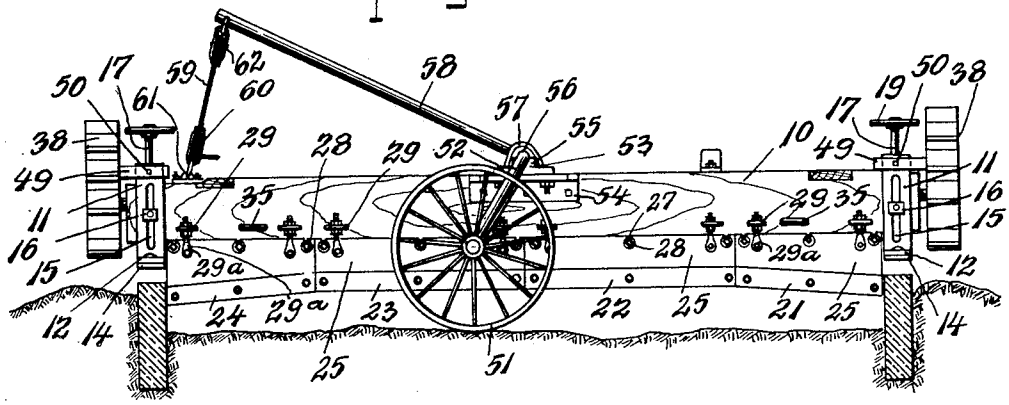


Fig. 2.

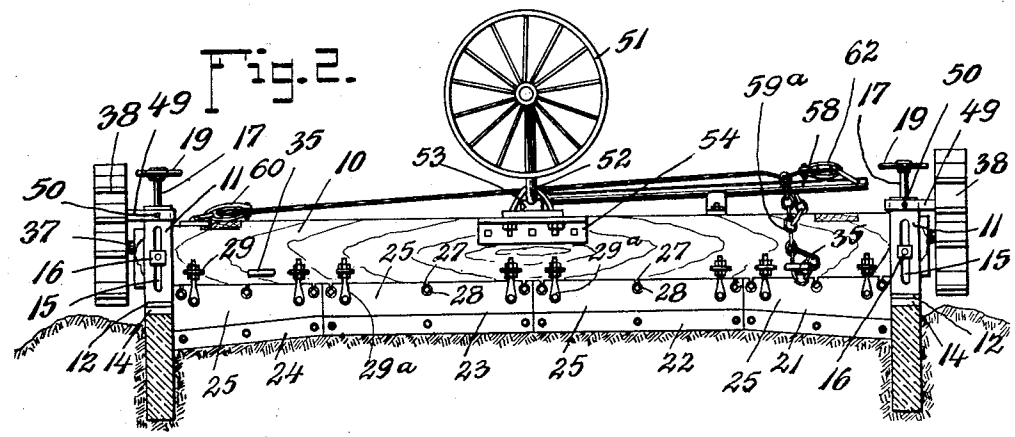
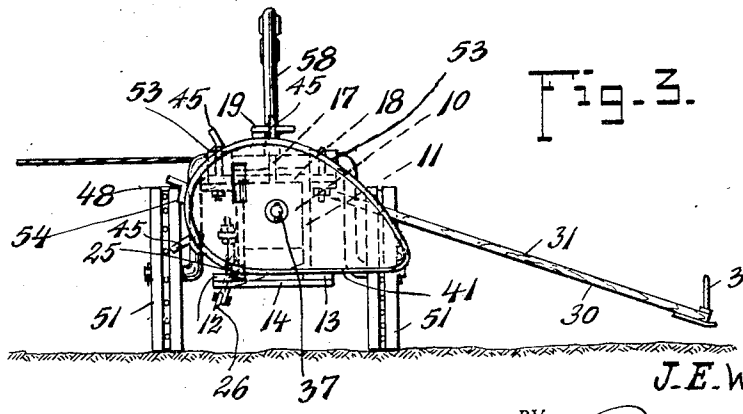


Fig. 3.



INVENTOR.
J. E. Wight.
BY Robbins Cobb
ATTORNEYS

Nov. 24, 1931. J. E. WIGHT 1,833,546

SUBGRADE FINISHING MACHINE

Filed May 23, 1929 4 Sheets-Sheet 2

Fig. 9.

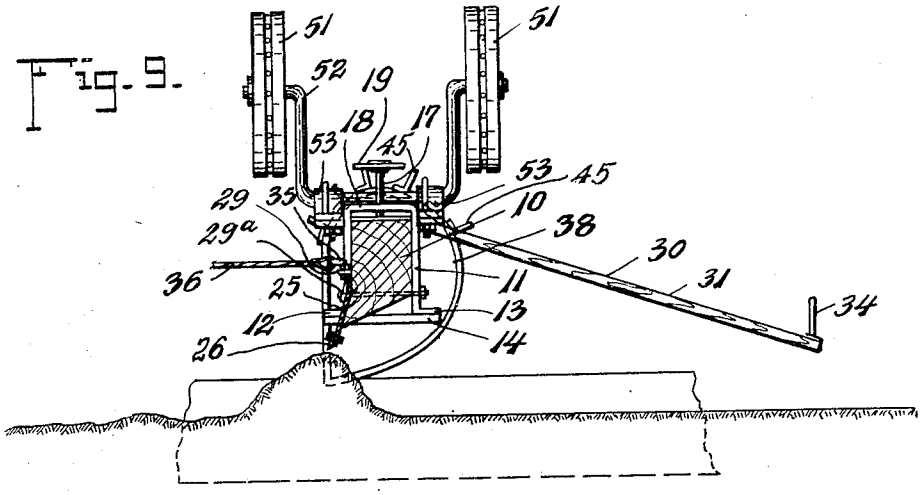


Fig. 10.

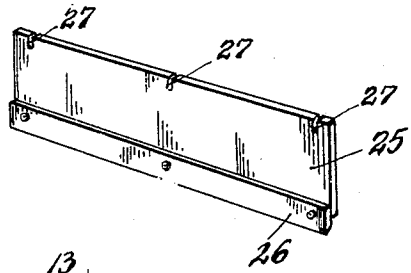


Fig. 11.

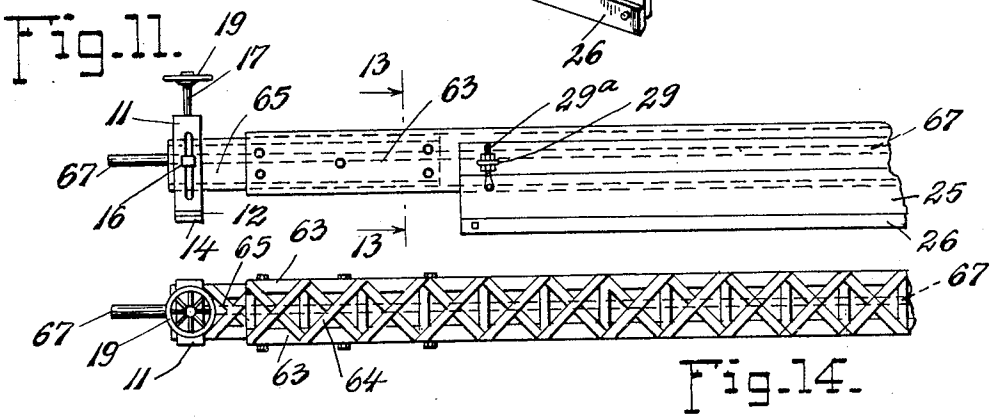
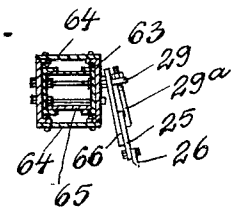


Fig. 14.

Fig. 13.



INVENTOR.
J. E. Wight.
BY Robb & Robb
ATTORNEYS

Nov. 24, 1931. J. E. WIGHT 1,833,546

SUBGRADE FINISHING MACHINE

Filed May 23, 1929 4 Sheets-Sheet 3

Fig. 4.

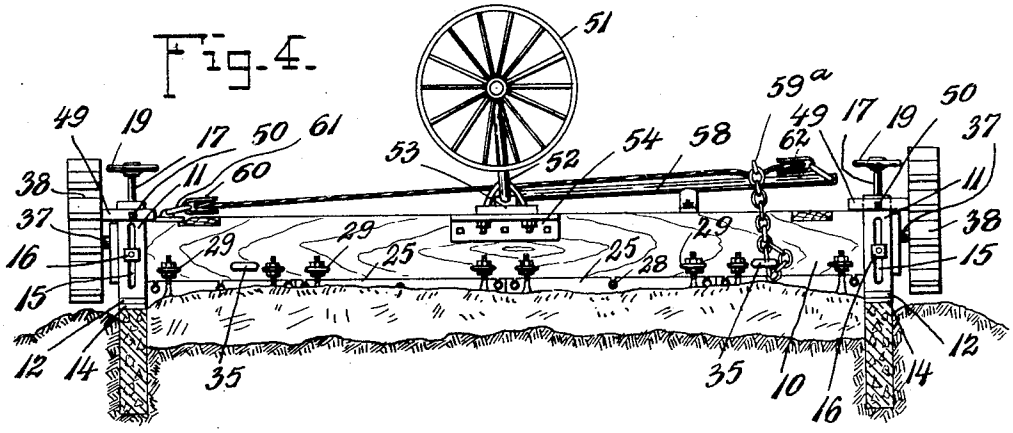


Fig. 6.

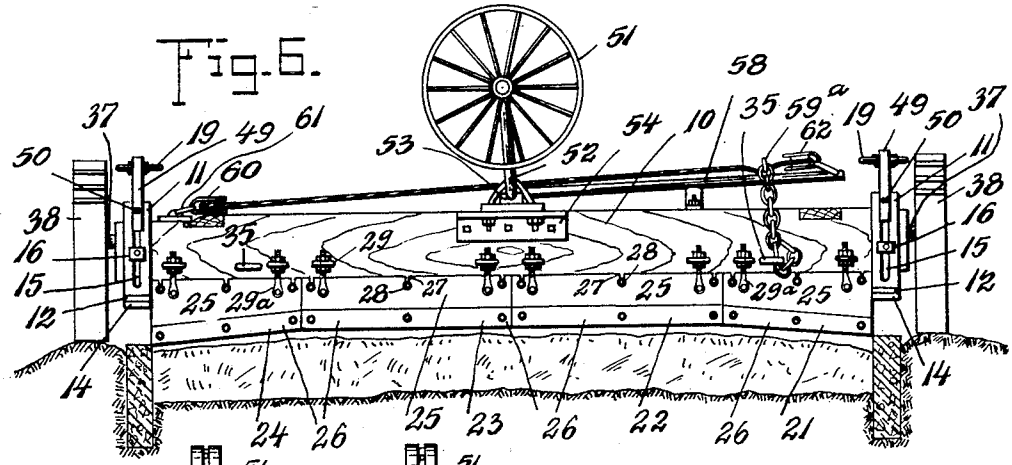
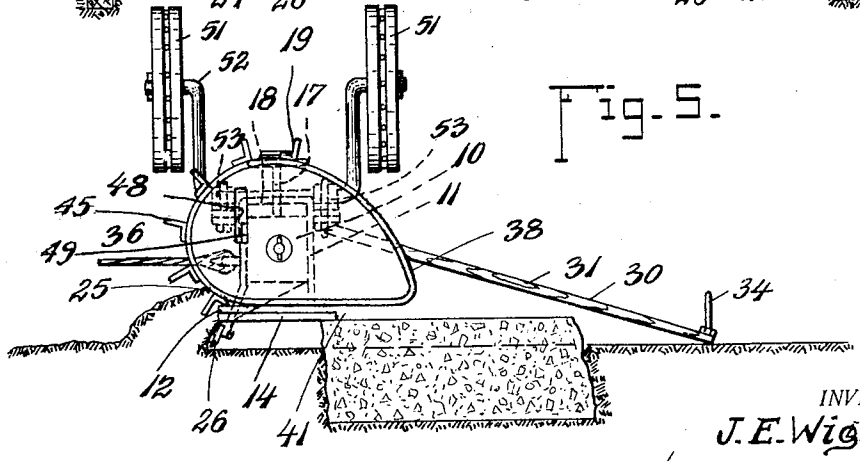


Fig. 5.



INVENTOR.
J. E. Wight.
BY Robert Cobb
ATTORNEYS

Nov. 24, 1931. J. E. WIGHT 1,833,546

SUBGRADE FINISHING MACHINE

Filed May 23, 1929 4 Sheets-Sheet 4

Fig. 7.

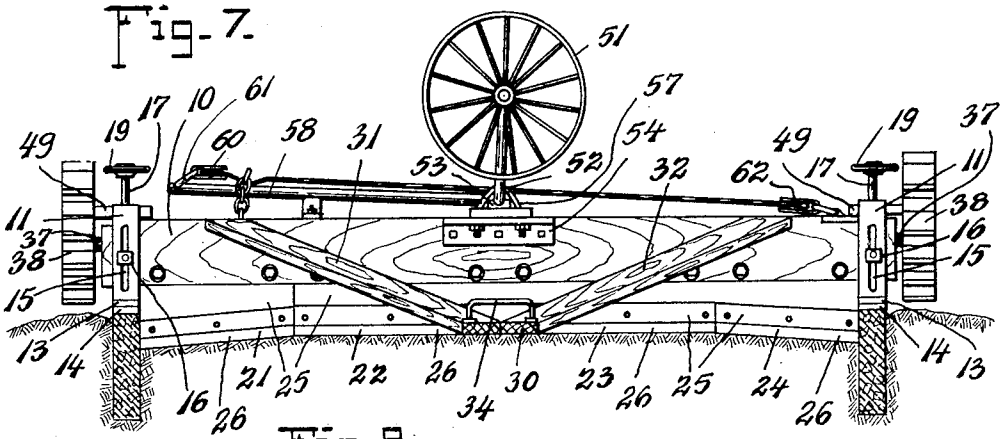


Fig. 8

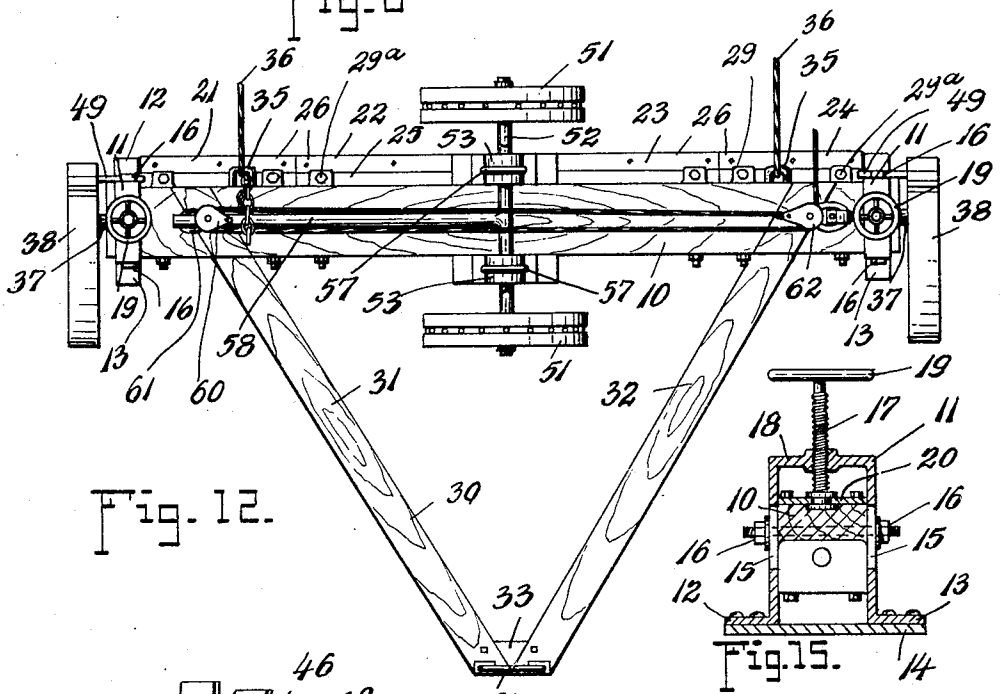


Fig. 12.

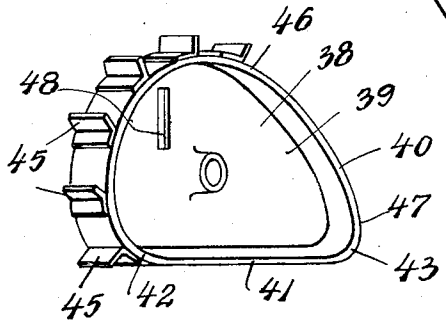
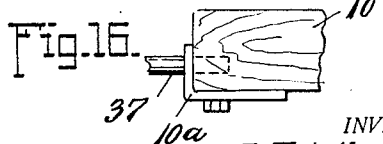


Fig. 15.

Fig. 16.



INVENTOR.
J. E. Wight.
BY Robert Robb
ATTORNEYS

Patented Nov. 24, 1931 1,833,546

UNITED STATES PATENT OFFICE

JOE E. WIGHT, OF EAST SAN DIEGO, CALIFORNIA, ASSIGNOR TO KOEHRING COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION

SUBGRADE FINISHING MACHINE

Application filed May 23, 1929. Serial No. 365,348.

Machines have been devised for uniformly grading roadways aiming to facilitate adaptation to the various conditions met with in practice, and a number of such are on the market. These machines are usually provided with scraper blades supported by carrying means and may be adjusted to various angles with the ground for producing the proper transverse grade. In the dumping of the dirt accumulated in front of the scraper in the movement by the machine longitudinally of the road, the scraper must be laboriously raised vertically with respect to the supporting frame or the dirt must otherwise be disposed of.

In certain types of machines the scraping operation must cease while the dirt is shoveled from in front of the scraper with a consequent material loss of time. An object of the invention is to overcome this difficulty in a simple and effective manner.

Simplicity and mobility, both as to construction and operation, is a prime desideratum in machines of this character and it is a further object of the present invention to simplify subgrading machines in these particulars.

In pursuance of these objects and bearing in mind effectiveness of the device when in operation, and convenience of transporting the same from one locality to another, I have contrived a machine along the following lines, economical of construction and durable under the stresses to which it is likely to be subjected.

The machine comprises a support for the scraper which latter is preferably made in sections each individually adjustable relative to the support. The support may be in the nature of a beam of wood designed to extend transversely of the roadway when the machine is in use. This beam is provided at its ends with supporting yokes adjustable relatively thereto and carrying at their lower ends, shoes which slide upon the head boards or road forms at the sides of the roadbed, as the machine progresses along the said roadbed. A trailing board or drag for maintaining the machine in scraping relation to the road bed, as the machine is drawn along, is provided extending rearwardly from the beam to which it is attached and resting at its rear end upon the ground.

A feature in the construction of my invention and consituting one of the important, if not the most important contribution to its successful operation is one by which the peculiar construction of the device is adapted to deposit dirt accumulated in front of the scraper at intervals along the road bed without interference with the process of the scraping operation. I accomplish this by means which may be brought into play at suitable intervals and which will act incident to the draught of the machine along the roadway. These means constitute elements which are adapted to contact with surfaces along the roadway and will by a cam movement cause the road dressing means to ride over the accumulated dirt. The feature of the machine illustrative of this principle and by which this is made possible is in the nature of two cam members rotatably mounted by means of trunnions, one at each end of the beam referred to above which are adapted to contact with the ground raising the scrapers to a position in which they can readily pass over the accumulated dirt. The dirt so deposited may subsequently be removed from the roadway in any suitable manner without interrupting the progress of the scraper along the roadway. The cams are preferably formed with a flat surface which merges into a curved surface the trunnion connection being eccentrically located relative thereto, thereby affording a gradual rise of the beam with the scrapers carried thereby when the cams are set in operation.

A further important feature of the machine tending to the adaptation thereof to convenience its transportation from one locality to another, lies in the peculiar mounting thereon of wheels whereby the same may readily be mobilized for use or turned to an inactive position and in one rendering them incapable of interfering with the operation of the scrapers. This is accomplished by mounting the wheels on a crank axle which is secured centrally of the beam in a transverse position relative thereto and by providing

a lever arm connected to the axle which, when turned in one position, will lower the wheels to contact with the ground and elevate the scrapers out of contact therewith, and which when turned to another position will conversely raise the wheels and permit the scraper to assume operative position.

The above, with other features which will be hereinafter described, make my device an extremely effective, convenient, and mobile construction which I will now describe in detail in connection with the accompanying drawings in which:

Figure 1 is a front elevation of a machine constructed in accordance with the principles of my invention and showing the transporting wheels in contact with the road bed with the consequent elevation of the scraper blades.

Figure 2 is a view similar to Figure 1 showing the wheels in inoperative position and the scraper blades lowered into contact with the road bed and the shoes in contact with the head boards at the sides of the road bed.

Figure 3 is a side view of a machine showing the transporting wheels in operative position and the scraping mechanism elevated from the ground.

Figure 4 is a view similar to Figure 2 showing a ridge of dirt accumulated in front of the scraper blade prior to the dumping of the same.

Figure 5 is a side elevation of a machine as shown in Figure 4.

Figure 6 is a view similar to Figure 4 showing the cam members in contact with the ground and the frame and scraper blades elevated to pass over the ridge of dirt accumulated in front thereof.

Figure 7 is a rear view of the machine showing the scraper blades in contact with the road bed and the cam members elevated.

Figure 8 is a top plan view of the machine showing from this angle the relation of the parts.

Figure 9 is a section transversely through the machine and showing one of the cams in one phase of its operation in carrying the scraper blades over the accumulated ridge of dirt.

Figure 10 is a perspective detail view of one of the scraper blades.

Figure 11 is a view in side elevation showing a modification of my invention.

Figure 12 is a perspective view of one of the cams showing cleats on the peripheral surface thereof.

Figure 13 is a sectional view taken about on the line 13—13 of Figure 11.

Figure 14 is a plan view of the modification shown in Figure 11.

Figure 15 is a sectional view taken through one of the shoe carrying yokes, and

Figure 16 is a detail view showing the manner of mounting the cam trunnions.

The present embodiment as illustrated in the above figures is to be considered as illustrative of one form which my invention may assume within the principles herein laid down and is not to be considered as in any way limiting the construction thereof to the specific form or details herein disclosed except as I shall be limited by the claims appended hereto.

In describing my invention in detail with reference to the drawings, the same numerals will designate the same parts in all figures of the drawings in which 10 designates a beam which may be of wood or any other suitable materials, and which is intended to extend transversely across the road bed upon which the scraping elements are to be employed. The beam is provided adjacent its ends with substantially U shaped yoke members 11, having forwardly and rearwardly extending flanges 12 and 13 extending at right angles thereto and designed to carry traction shoes 14 thereupon. The yoke members are mounted upon the beam and have vertically slidable connection therewith and are provided in the leg of the U member with elongated slots 15 through which bolts 16 passing through the beam, project. Adjustment of the shoes 14 relative to the beam is accomplished through screw members 17 threadedly connected with the arch 18 of the yoke and having hand wheels 19 secured at their upper ends. and grooves at their lower ends adapted to engage bearing plates 20 secured to the top surface of the beam. The ends of the beam may have brackets 10*a* affixed thereto as shown in Figure 16, to form bearings for trunnions 37.

This construction permits of the adjustment of the blades to various depths in the roadbed. These blades, which are designated by the numerals 21, 22, 23 and 24, are made in two parts as clearly shown in Figure 10. Upper or main supporting parts 25, have scraping elements 26 secured to the lower portion thereof and extending downwardly therefrom. The upper parts 25 have elongated slots 27 formed therein which receive bolts 28. These bolts 28 pass through the beam 10, and the slots 27 permit vertical adjustment of the blades in respect to the beam. Eye-bolts 29, secured to the beam, cooperate with bolts and nuts 29*a*, affixed to the blades to effect the vertical adjustment of the blades in respect to the beam 10. By means of this arrangement and by forming the scraping member of a plurality of scraping blades as herein set forth, it will appear that the blades may be adjusted relative to each other so as to produce in the crown of the roadway any desired transverse curvature that conditions to be met may dictate. Adjustment is also possible relative to the beam itself for any purpose and as may be desired within the me-

chanical limitations of the construction as set forth above.

The shoes 14, as will appear from the drawings, are of but slightly greater length than the width of the beam and will therefore afford a small supporting surface with the side rails defining the roadway which is a desirable feature but tends to increase the instability of the machine when being drawn along the roadway with the shoes in contact with the said side rails and with the blades pushed into the earth. It will be obvious that with such a relationship the machine will tend to turn over forwardly when a pull is exerted by traction means upon the beam. In order to effect stability I provide a trailer member 30 which may be comprised of timbers 31 and 32 secured at their forward ends to the beam 10 and converging rearwardly as shown in Figure 8, the rear ends being preferably connected by a cross member 33, and having secured thereto a hand grip 34, in the nature of a U-shaped bar as clearly illustrated in Figure 7. The beam 10 is provided with a pair of eye-bolts 35 suitably spaced on either side of the center of the machine to which may be attached cables 36 which may be secured at their free ends to a tractor or the like, not shown, and by means of which the scraper mechanism may be drawn along the roadway.

It is obvious that as the machine is drawn along the roadway with the blades lowered into scraping position, that an accumulation of dirt will be effected from time to time which will impede the progress of the machine and interfere with its proper functioning. It is desirable therefore to relieve the scraper blades of this accumulation from time to time without stopping the progress of the machine along the roadway. I accomplish this by providing at the ends of the beam 10 trunnions 37 upon which are eccentrically mounted cam shaped traction members 38. The cam shaped members being of the same construction, only one need be described in detail.

The cam shaped member consists of a web 39 having a marginal tread in the nature of a rim 40, which is flat as at 41 between certain limits as designated by the numerals 42 and 43 and is curved throughout the remainder of its extent, curvature beginning at the limit 42 which may be considered the forward end of the portion 41, and is gradual and substantially circular in shape. This portion lies also substantially concentric with the hub 44 and is provided with transverse cleats 45 which aid in the turning movement thereof as will hereinafter appear. The curve of the flange is then somewhat flattened and slopes rearwardly to its juncture with the flat portion 41 between the limits 46 and 43, the curvature between these limits growing increasingly eccentric with relation to the hub 44, reaching its limit of eccentricity at its juncture 43 with the flat surface 41. The webs 39 are provided with slots 48 forwardly of the hubs 44 and latching members 49 are provided which are pivotally secured to the yoke members 11 as at 50, which may be swung to position for entering the slots 48 and holding the cam shaped members in inoperative position as shown in Figures 1, 2 and 3, with the flat portion of the rim or tread 41 lowermost.

When a sufficient amount of dirt has accumulated in front of the scraper blades and it is desired to relieve the blades of this accumulation, the latch members 49 are removed from the slots 48 of the cam members 38 permitting them to pivot around the trunnions 37.

As the cleats 45 contact with the ground at the sides of the road bed, the cam shaped members will start rotating in a counter-clockwise direction, viewed from the left side of the machine, and when they have rotated to a position where the portion 47 thereof is in contact with the ground, the scraper blades will have been raised to position to pass over the ridge of accumulated dirt, as shown in Figure 9 of the drawings. When the scrapers have passed over the ridge, the machine will be lowered to scraping position again by the cam members which permit the machine to be lowered gradually to its former position with the shoes 14 engaging the road rails. When it has again reached operative position for scraping, the cam shaped members are again latched in their inoperative position and the scraping operation may be continued without interruption. The ridge of dirt left behind may be removed from the road bed by a scoop or in any other manner as may be desired.

In transporting machines of this character from one locality to another, it is not infrequently the custom to load the same on trucks which necessitates the unloading thereof at the next location of operation. I propose to facilitate the transporting of my device from one locality to another without the necessity of loading and unloading the same upon a truck, by providing transportation means in connection with the scraper itself. Means of this character is shown in the drawings which comprises wheels 51 rotatably mounted on a crank axle 52 which is itself in turn pivotally secured to the beam 10 by means of bearings 53 comprising flanged plates 54 and members 55 and 56 secured thereto by U bolts 57. The crank axle is rotatable in these bearings through an arc of 180 degrees by means of a bar 58 secured centrally thereto. At one limit of the movement of this bar the wheels will be in position to support the scraping mechanism spaced from the ground and at the

other limit, the wheels will be supported above the frame and in inoperative position. The bar may be secured at either limit of its movement by suitable means as by a chain 59*a*. The machine is provided at one side thereof with a pulley 60 which may be secured to the beam 10 as by a ring 61. Secured to the end of the bar 58 is a cable 59 which may be connected therewith through the instrumentality of a pulley 62, the cable being trained about the sheaves of the pulleys for facilitating the drawing of the wheels 52 to position to support the machine elevated above the ground. The free end of the cable may be either pulley by the hands to effect this movement or may be secured to a tractor or other power means.

From the above description it will appear that I have produced a mechanism adjustable to various conditions for scraping a road bed and which will deposit the accumulated dirt at intervals along the road bed without impeding the scraping operation and without the necessity of stopping the machine. I have also provided for the ready demobilization of the machine as a scraping unit and the instant mobilization of transportation facilities therefor. When the transportation facilities are mobilized, as described above, the beam 10 may be connected endwise to a tractor or other means, and the machine is ready for transportation from one location to another. It will be noted further that these advantages are accomplished in my machine in a very simple manner and without complicating the mechanism.

In Figures 11, 13 and 14, I have shown a modification, wherein the beam 10 is replaced by a built-up beam comprising channel members 63, laced together by braces 64. The yokes 11, are supported by a similar structure 65, which telescopes into the beam formed by the channel members 64 and 63, thereby permitting adjustment of the machine for different widths of roads. A plate 66 secured to the members 63 is availed of for carrying the scraper blades in the manner hereinbefore set forth. In this construction, the trunnions 37 may take the form of a single axle extending throughout the length of the beam as shown at 67.

When the latches 49 are lifted out of engagement with the slots 48 of the cam member 39, they may be left resting on the vertical walls thereof so as to gravitate into the slots 48 after one complete revolution of the cam members, thereby automatically locking them in inoperative position. During this dumping action, the handle 34 may be availed of for lifting the members 31 and 32 thereby allowing the accumulated dirt to pass therebeneath.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is:—

1. A road scraping machine consisting of a beam, means at the ends thereof to facilitate progress thereof along fixed tracks, a scraper member on said beam and cam like members rotatably secured to the ends of the beam having peripherally, a flat and a curved surface, the curved surface merging gradually at one end with the flat surface and connecting abruptly therewith at the other end, cleats on the curved surface adjacent the first named connection with the flat surface, slots in the cam like members and latching members on the beam positioned to enter said slots to hold the cam members elevated in inoperative position.

2. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon, supporting means for the frame, said means including shoes adapted to normally slide along the surface of head boards at each side of the subgrade, and means for lifting said shoes out of contact with the head boards and at the same time supporting said frame under certain conditions, the means being arranged to reposition the shoes upon the head boards upon completion of the lifting operation.

3. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon, supporting means for the frame, said means including shoes adapted to normally slide along the surface of head boards at each side of the subgrade, and means for lifting said shoes out of contact with the head boards and at the same time supporting said frame under certain conditions, the slide surfaces of said shoes normally depending below said last named means, the said last named means being arranged to automatically reposition the shoes upon the head boards after completion of the lifting operation.

4. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon, supporting means for the frame, said means including shoes adapted to normally slide along the surface of the head boards at each side of the subgrade, and means for moving said shoes out of contact with head boards and at the same time supporting said frame under certain conditions, the slide surfaces of said shoes normally depending below said last named means and extending above the same during said certain conditions, the said means for moving the shoes being also adapted to automatically replace the shoes upon the head boards after the moving operation.

5. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon, supporting means for the frame, said means including shoes adapted to normally slide along the surface of head

boards at each side of the subgrade, means for moving said shoes out of contact with head boards and at the same time supporting said frame under certain conditions, and instrumentalities for adjusting the height of the frame from the road, the said means being adapted to travel along the outside of the head boards and to automatically replace the shoes in traveling position upon the head boards upon completion of the lifting operation.

6. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon, supporting means for the frame, said means including shoes adapted to normally slide along the surface of head boards at each side of the subgrade, and means for lifting said shoes out of contact with the head boards and at the same time supporting said frame under certain conditions, said shoes being disposed inwardly of said last named means, the said means being adapted to travel along the outside of the head boards and to automatically replace the shoes in traveling position upon the head boards upon completion of the lifting operation.

7. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon, supporting means for the frame, said means including shoes adapted to normally slide along the surface of head boards at each side of the subgrade, and means for lifting said shoes out of contact with the subgrade and at the same time supporting said frame under certain conditions, said last named means having ground gripping portions, and being movable at will into operative and inoperative positions and extending beyond the head boards, the said means automatically replacing the shoes in traveling position upon the head boards upon completion of the lifting operation.

8. In a road subgrade treating machine, a frame, subgrade treating instrumentalities carried by the frame, supporting means for the frame, the said means including traction shoes adapted to normally slide along the surface of head boards at each side of the subgrade, and means movable into and out of ground engaging positions exteriorly of the head boards to correspondingly move the traction shoes out of and into engagement with the head boards, the said movable means supporting the frame when in ground engaging positon and automatically placing the traction shoes into traveling position upon the head boards when moved out of ground engaging position.

9. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon and comprising a hollow beam formed of cooperating channel members, a member telescoping into each end of the beam for adjusting the widths of the machine to the width of a given subgrade, the telescoping member carrying supporting means for the frame which means include traction shoes adapted to normally slide along the surface of head boards at each side of the subgrade, and rotative means movable into and out of ground engaging positions exteriorly of the headboards to correspondingly move the traction shoes into and out of engagement with the head boards, the said rotative means supporting the frame when in ground engaging position and being positioned outside of the head boards so as to automatically position the traction shoes in traveling position upon the head boards when moved out of ground engaging position.

10. In a road scraping machine adapted to move over a subgrade, a frame, a scraper device thereon and comprising a beam, means movably carried by the beam for adjusting the width of the machine to the width of a given subgrade, the said movable means carrying frame supporting members including traction shoes adapted to normally slide along the surface of head boards at each side of the subgrade and rotative means movable into and out of ground engaging positions exteriorly of the head boards to correspondingly bring the traction shoes into and out of engagement with the head boards, the rotative means supporting the frame when in ground engaging position with respect to the head boards to automatically position the traction shoes in traveling position upon the head boards when the rotative means are moved out of ground engaging position.

In testimony whereof I affix my signature.

JOE E. WIGHT.