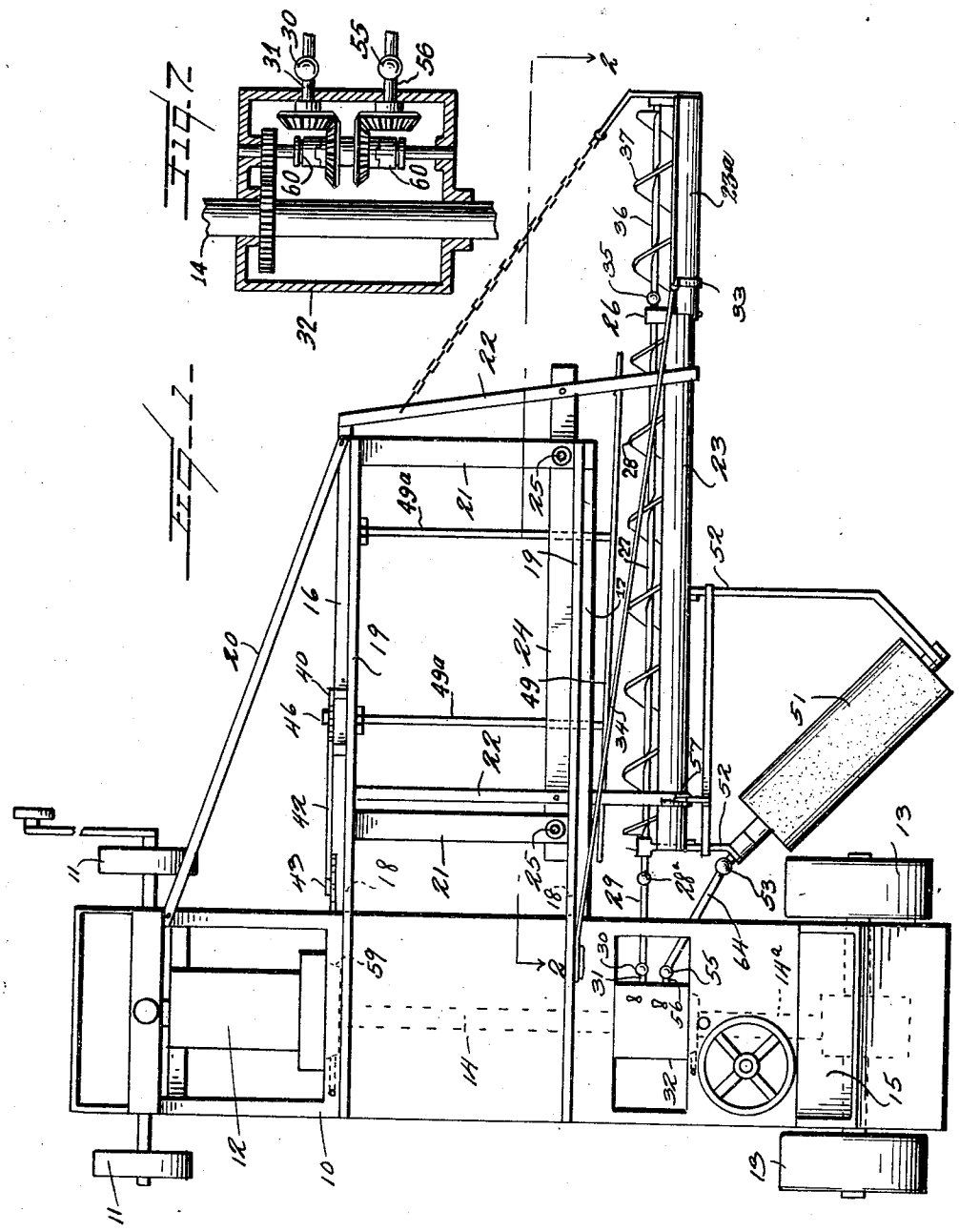
Sept. 1, 1931. E. S. LUCAS 1,821,843

SHOULDER LEVELING AND FINISHING MACHINE

Filed June 12, 1930 4 Sheets-Sheet 1



Inventor

E. S. Lucas

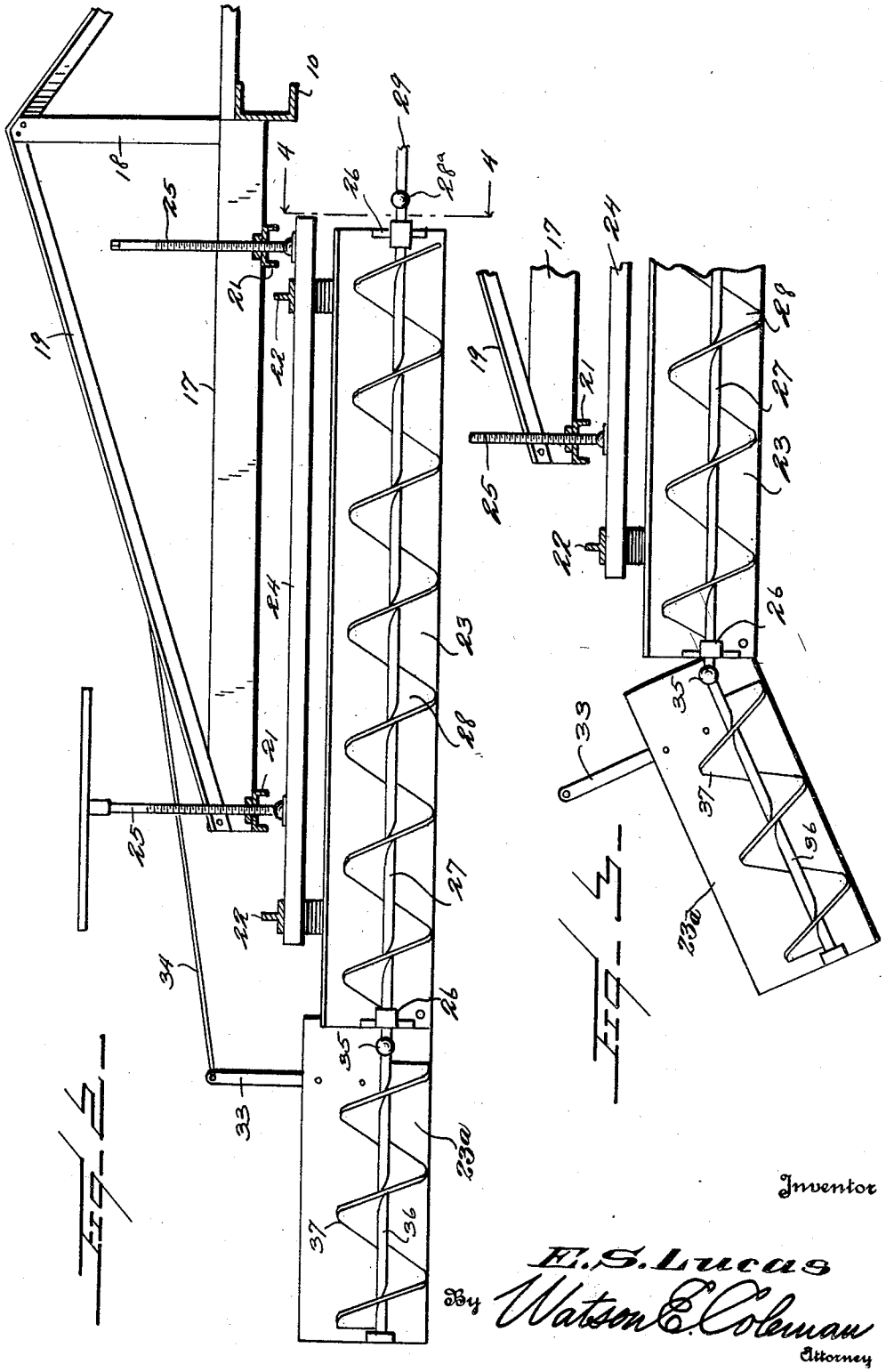
By Watson E. Coleman

Attorney

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SHOULDER LEVELING AND FINISHING MACHINE

Filed June 12, 1930 4 Sheets-Sheet 2



Inventor

E. S. Lucas

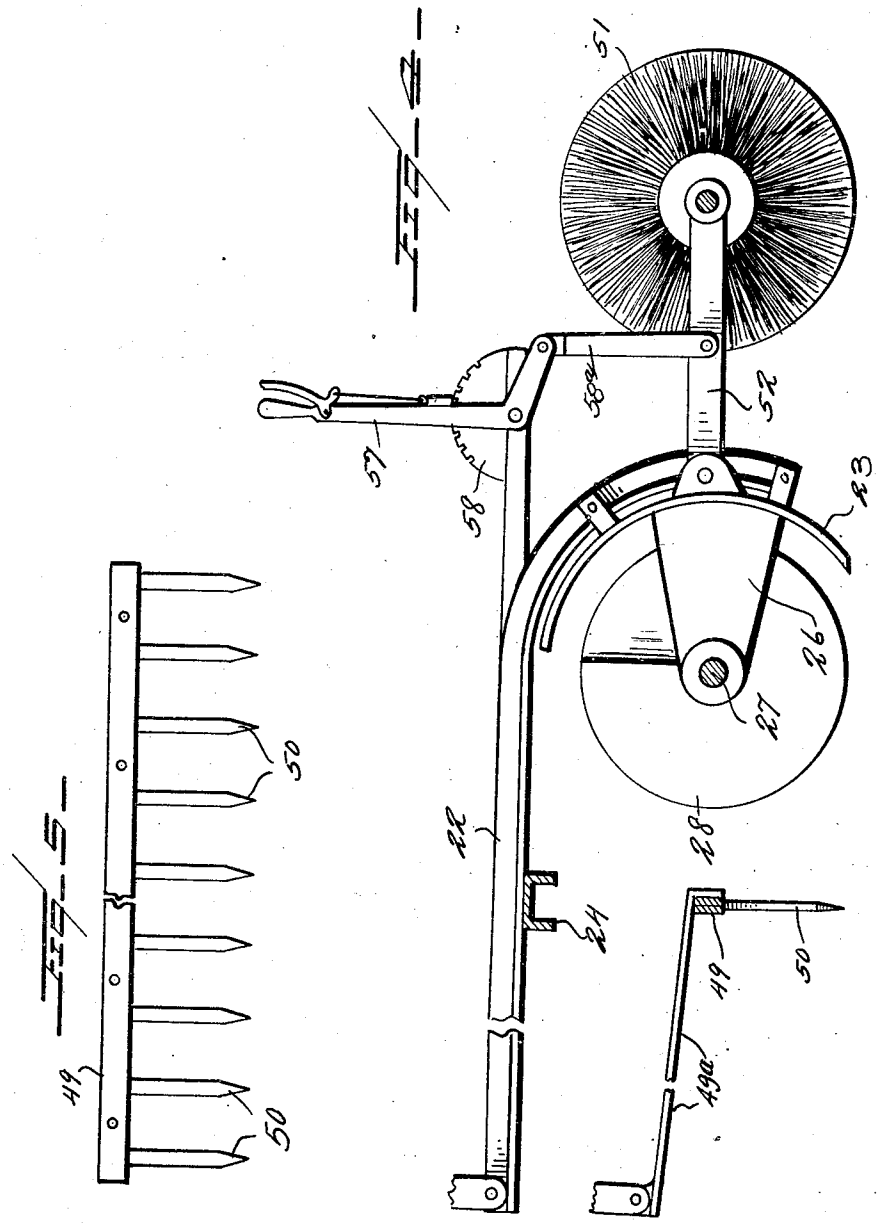
By Watson E. Coleman

Attorney

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SHOULDER LEVELING AND FINISHING MACHINE

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Inventor

E. S. Lucas

By Watson E. Coleman

Attorney

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SHOULDER LEVELING AND FINISHING MACHINE

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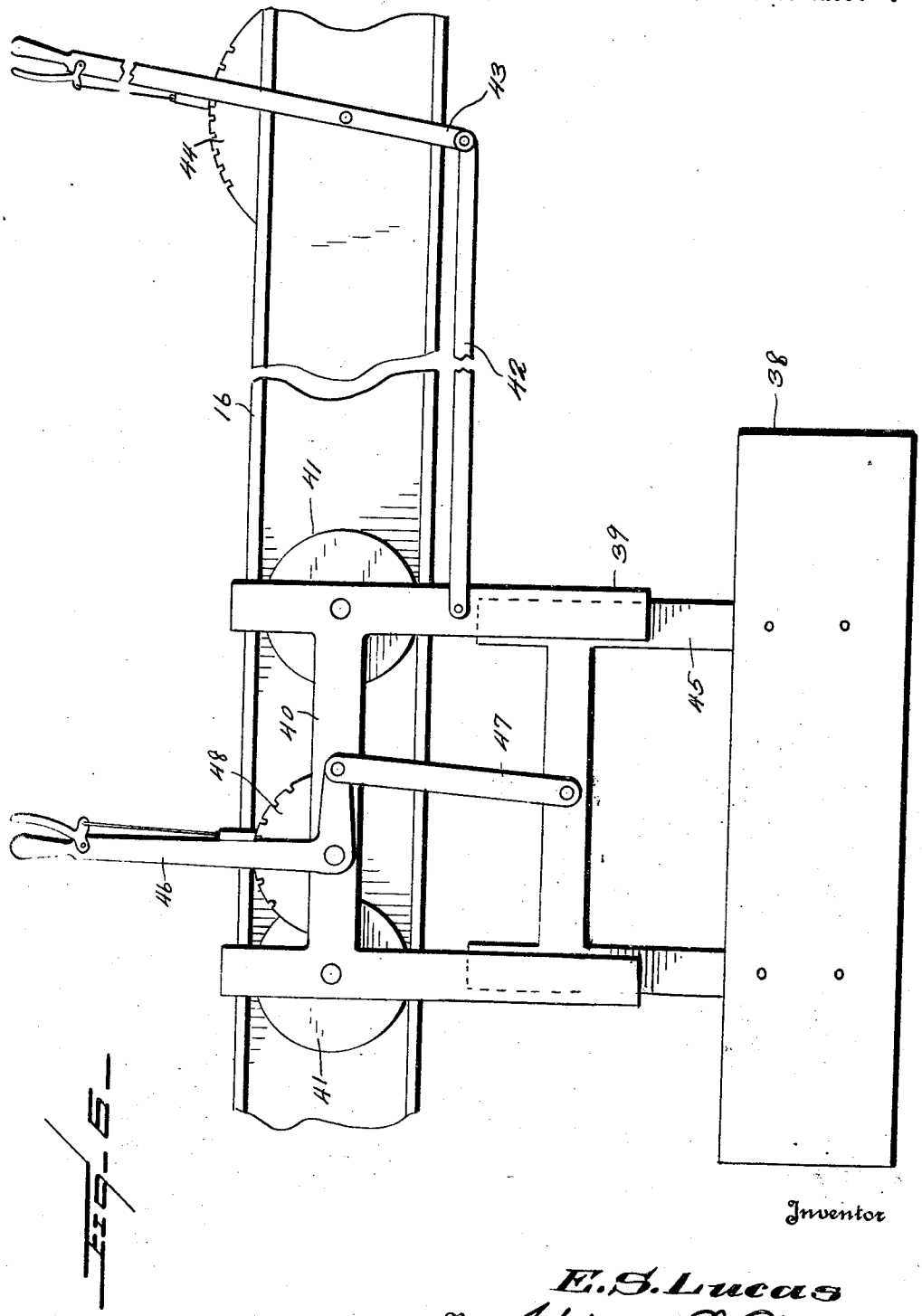


Fig. 5.

Inventor

E. S. Lucas

By Watson E. Coleman

Attorney

Patented Sept. 1, 1931 1,821,843

UNITED STATES PATENT OFFICE

EARL S. LUCAS, OF AVOCA, IOWA, ASSIGNOR OF ONE-HALF TO FRANK J. MORAN, OF OMAHA, NEBRASKA

SHOULDER LEVELING AND FINISHING MACHINE

Application filed June 12, 1930. Serial No. 460,682.

This invention relates to blades and screw conveyers particularly in a machine for finishing the shoulders on either side of a paved highway.

In laying down and constructing modern highways, it is the practice, at least in certain portions of the country, to provide on each side of the highway a relatively wide dirt shoulder, as it is termed, on which cars may be parked, etc. These shoulders extend laterally from the concrete highway and at their side edges usually dip downward to a level with the surface of the ground.

The object of my invention is to provide a machine designed to run upon the paved highway itself, which will finish, level and grade these shoulders and which machine is preferably provided with a conveyor or distributor, acting to distribute the dirt, which is ordinarily piled or dumped more or less closely to the highway itself, over the shoulder, and which is provided with a scraper which will level this dirt and grade or finish the shoulder and which will grade or finish the slope of the outer margin of the shoulder.

A further object is to provide a machine of this character having preferably a scarifier disposed in advance of the distributing conveyor and scraper which will act to loosen the packed earth so that the distributor and scraper may operate on loose dirt and also provide an auxiliary scraper disposed in advance of the machine scraper and distributor which will act to cut down and more or less shift the dirt which has been dumped along the margin of the highway for the purpose of forming this shoulder so that this dirt may be more readily acted upon by the distributor and by the main scraper.

A further object is to provide a rotary brush operating behind the main scraper and distributor and operating over the margin of the paved portion of the highway, the brush acting to sweep the dirt from the concrete margin of the highway on to the shoulder, said brush to be set on 45 degree angle.

Further objects are, of course, to provide means whereby these various instrumentalities may be operated, raised, lowered and adjusted in accordance with the requirements of the special case.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a top plan view of a shoulder finishing machine constructed in accordance with my invention;

Figure 2 is a fragmentary front elevation of the leveling blade, the distributor and the supports therefor;

Figure 3 is a like view to Figure 2, but showing the auxiliary leveling blade angled;

Figure 4 is a side elevation of the scarifier, the leveling blade, the distributor and the brush;

Figure 5 is an elevation of the scarifier;

Figure 6 is an elevation showing the manner in which the auxiliary blade may be raised, lowered or otherwise adjusted;

Figure 7 is a sectional view of a transmission mechanism.

Referring to these drawings, 10 designates a motor truck or any other motor propelled truck chassis having the usual front steering wheels 11, the motor 12 and the rear driving wheels 13 and the driving shaft 14. In this truck, the operator's seat 15 is preferably disposed adjacent the rear end of the truck.

Bolted to the truck frame or chassis and extending laterally therefrom, in either direction, but preferably toward the right are the transverse frame beams 16 and 17 which may be made of angle iron, channel iron or have any other ordinary structural shape. These beams are braced by the vertical struts 18 and the truss beams 19 which extend downward from these struts to the ends of the transverse beams to which they are bolted. A brace 20 may extend from the forward end of the chassis rearward and outward to the extremity of the beam 16 and any suitable bracing may be used for this auxiliary frame.

The forward and rear beams 16 and 17 are connected to each other by longitudinal irons 21 which may have any suitable cross section and which are preferably bolted or riveted to the beams 16 and 17. Hingedly

connected at their forward ends to any suitable portion of the frame formed by the members 16 and 17 and 21 are the draw bars 22. These draw bars may be pivoted by bolts to the side walls of the longitudinal channel bars 21 or may be swung from the bar 16. These draw bars extend rearward and are downwardly curved at their rear ends and support a scraper blade 23. The draw bars adjacent their rear ends are connected to and carry the transversely extending cross bar 24 which braces these draw bars but holds them in proper spaced relation and permits the draw bars to move upward and downward as a unit.

Extending though the extremities of the braces 21 are the adjusting screws 25 which have swivel engagement with the transverse bar 24 and by rotating these screws, the scraper blade may be adjusted up or down and disposed, if desired, at a slight inclination or angle to the horizontal.

The scraper blade has forwardly projecting ears 26 at its ends and mounted in these ears is a shaft 27 carrying upon it a screw conveyor 28, the conveyor acting as will be explained, as a distributor. The conveyor shaft is connected by a universal joint connection 28^a with a shaft 29 which in turn is connected by a universal driving connection 30 with a shaft 31 disposed within a power unit housing 32. The driving connection to this shaft 31 will be later stated. Suffice it to say that by this means, the power can be at all times applied to rotate the shaft 27 and the screw conveyor or distributor while the blade and the conveyor or distributor are raised or lowered to suit the circumstances of operation.

Preferably and in order to form a downwardly and outwardly inclined surface at the outer edge of the shoulder, I provide a scraper section 23*a* which is hingedly connected to the main scraper blade 23 so that it may be raised into alinement with the scraper blade 23 or disposed downward at an angle thereto. For this purpose, I have provided the scraper 23*a* with an upwardly extending arm 33 from which a cable 34 leads to the body of the machine so that by taking up upon this cable, the blade 23*a* may be raised. By slacking on the cable, the blade may be lowered. The shaft 27 connects by a flexible driving connection 35 to a shaft section 36 which carries the screw blade 37 which forms an extension of the screw blade 28. This wing or auxiliary blade 23*a* is braced against strain in any suitable manner.

Mounted upon the beam 16, preferably for transverse adjustment and for vertical adjustment, is a small scraper blade 38 disposed at a slight inclination to a vertical plane, this scraper blade being for the purpose of engaging heaps of dirt dumped beside the roadway and initially breaking up this dirt and shifting it laterally so that it may be engaged first by the distributor or conveyor blade 28 and then by the scraper blade 27. This blade 38 need only be relatively short. Preferably, the blade is supported by vertical members or guides 39 upon a carriage 40 which carriage has wheels 41 engaging with the flanges of the beam 16 so that the blade may be shifted laterally in or out. For this purpose, the carriage is connected by a link 42 to an adjusting lever 43 operating over an arcuate rack 44. Disposed between the guides 39 is a slide 45 to which the blade 38 is attached and mounted upon the carriage is a lever 46 connected by a link 47 to this slide and operating over a sector 48 so that as the lever 46 is shifted, the slide may be raised or lowered to adjust the vertical height of the blade 38.

I do not wish to be limited to any particular means for this purpose as it is obvious that many different means might be used for adjusting the blade 38 laterally upon the beam 16 and adjusting the blade 38 vertically.

A scarifier comprising a scarifying bar 49 having downwardly projecting teeth 50 may also be mounted upon the beam 16 in any suitable manner, the teeth projecting downward and contacting with the earth of the shoulder so that in case this earth is packed, the earth can be scarified or loosened so that it may be more easily treated by the scraper 38 and the main scraper 23 and the distributor. This scarifier may be mounted for vertical adjustment if desired and under ordinary circumstances will be attachable to or detachable from the beam 16, as for instance by means of bolts so that the scarifier may be used or not as circumstances may require.

Preferably there is disposed rearward of the distributing conveyor 28 and the blade 23 and closely adjacent the inner end of the blade a rotary brush 51. This is preferably mounted at its outer end on a link 52 which is pivoted to the blade 23. The inner end of the brush is connected by a flexible coupling 53 to a shaft 64 which in turn is connected by a flexible coupling 55 to a driving shaft 56 which extends into the power unit housing 32 and secures power therefrom as will be later stated. A lever 57 mounted upon a prolongation of the draw bar 22 and moving over a rack 58 is connected by a link 58^a to the free end of the link 52. By this means, the brush may be raised or lowered independently of the scraper blade 23. This rotary brush acts to clean the paving curb and the gutter while the machine is moving.

In order to guide the machine at a set or fixed distance from the paving slab or edge line of the paving proper and secure a straight and uniform shoulder line, I provide the guide roller 61 mounted upon a for-

wardly extending arm which may be mounted upon the front axle of the machine. In operating this machine, the machine will be steered so as to carry the guide roller along the edge of the concrete or other pavement, using this edge as a guide, the operator at the steering wheel constantly watching to see that this guide travels along this edge. The shaft 14 is connected to the motor 12 by means of a clutch 59 operated by means of a clutch pedal disposed adjacent the driver's seat (not shown) and the supplemental power unit which is disposed within the housing 32 includes a power take-off shaft adapted to be connected by means of a clutch 60 with the shaft 14 which leads to the rear driving wheels. Any suitable connection may be made from the driving shaft 14 to the power take-off shaft 14ª which will include a clutch whereby the power take-off shaft may be connected to or disconnected from the driving shaft 14. Inasmuch as power take-off connections of this kind are common and well-known, it is not believed necessary to illustrate such construction in detail. This power take-off shaft extends into the power unit housing 32 and is there connected by suitable gearing to the shafts 31 and 56. Thus the truck may be stopped in its forward movement without stopping the action of the distributing conveyor or the brush, the purpose being to provide a construction whereby the truck may be operated without operating the brush or conveyor or whereby the truck may be stopped and the conveyor and brush operated.

The main frame is to be preferably of eight inch channel iron while the supplemental frame is to be of three inch angle iron bolted to the main frame or chassis. This permits the parts to be disassembled for moving or shipping. The short conveyor and blade 37 and 23ª respectively at the outer end of the main blade is hinged so that this hinged section can be raised or lowered to any desired position. This short blade is approximately three feet long and when lowered, it may be used for fills and when raised for closed ditch sections.

The size of the screw conveyor will depend upon the horsepower of the motor used. I have found in actual practice that a twelve inch conveyor with a forty or fifty H. P. engine is eminently suitable for the work to be done under ordinary conditions. The screw conveyor travels very slowly and acts to auger the dirt outward while the blade immediately behind it smooths and shapes the shoulder, the conveyor acting to convey the dirt outward and over the edge of the shoulder.

I do not wish to be limited to the details of construction and arrangements of parts, as obviously these might be changed in many ways without departing from the spirit of the invention, as defined in the appended claims.

I claim:—

1. A machine of the character described, comprising a motor operated truck, an element extending laterally therefrom and mounted for vertical adjustment relative to the truck, a leveling blade mounted upon said element and extending laterally from the truck, a screw conveyor mounted in front of the leveling blade and having a longitudinally extending shaft, motor driven connections for operating the shaft, an auxiliary blade mounted at the end of the first named blade for movement into different angles with relation thereto, an auxiliary screw conveyor shaft mounted in said auxiliary blade and having universal joint driving connection with the shaft of the distributor blade, and means for angularly adjusting the auxiliary blade and the shaft with relation to the first named blade of the shaft.

2. A machine of the character described, including a motor truck, a blade extending laterally therefrom, a screw conveyor acting as a distributor and mounted immediately in front of said blade, motor operated means for driving the screw conveyor and a short blade mounted in advance of the first named blade and adapted to engage heaps of material and break up these heaps so that the material may be acted on by the first named blade and distributor.

3. A machine of the character described, including a motor truck, a blade extending laterally therefrom, a screw conveyor acting as a distributor and mounted immediately in front of the blade, motor operated means for driving the screw conveyor and a short blade mounted in advance of the first named blade and adapted to engage heaps of material and break up these heaps so that the material may be acted on by the first named blade and distributor, said second named blade being transversely adjustable.

4. A machine of the character described, including a motor truck, a blade extending laterally therefrom, a screw conveyor acting as a distributor and mounted immediately in front of said blade, motor operated means for driving the screw conveyor and a short blade mounted in advance of the first named blade and adapted to engage heaps of material and break up these heaps so that the material may be acted on by the first named blade and distributor, said second named blade being vertically and transversely adjustable.

5. A machine of the character described, comprising a motor operated truck, an element extending laterally from the truck, a blade supporting beam mounted below the element, means for vertically adjusting said beam, a leveling blade operatively mounted upon said beam and vertically adjustable therewith, a screw conveyor mounted upon

and in front of said blade and acting as a distributor, a driving shaft connected to the shaft of the screw conveyor by flexible, driving connection, and means for driving said shaft from the motor including a clutch whereby the shaft may be disconnected from the motor.

6. A machine of the character described, including a motor truck, a frame extending laterally from the truck, a leveling blade mounted upon the frame for vertical adjustment, a distributor mounted in front of the blade, and a detachable scarifier mounted upon the frame in advance of the blade, and a relatively short blade mounted for vertical and lateral adjustment upon said frame immediately in front of the scarifier.

7. In a machine of the character described, a motor truck, a leveling blade extending laterally therefrom and vertically adjustable, a screw conveyor acting as a distributor and mounted immediately in front of said leveling blade, motor operated means for driving the screw conveyor and a rotary pavement brush mounted behind the blade and screw conveyor at the inner end of the blade, and motor operated means for driving said brush.

In testimony whereof I hereunto affix my signature.

EARL S. LUCAS.