Nov. 6, 1934. D. A. HEMSTREET ET AL 1,979,619

ROAD BUILDING MACHINE

Filed Jan. 9, 1932 3 Sheets-Sheet 1

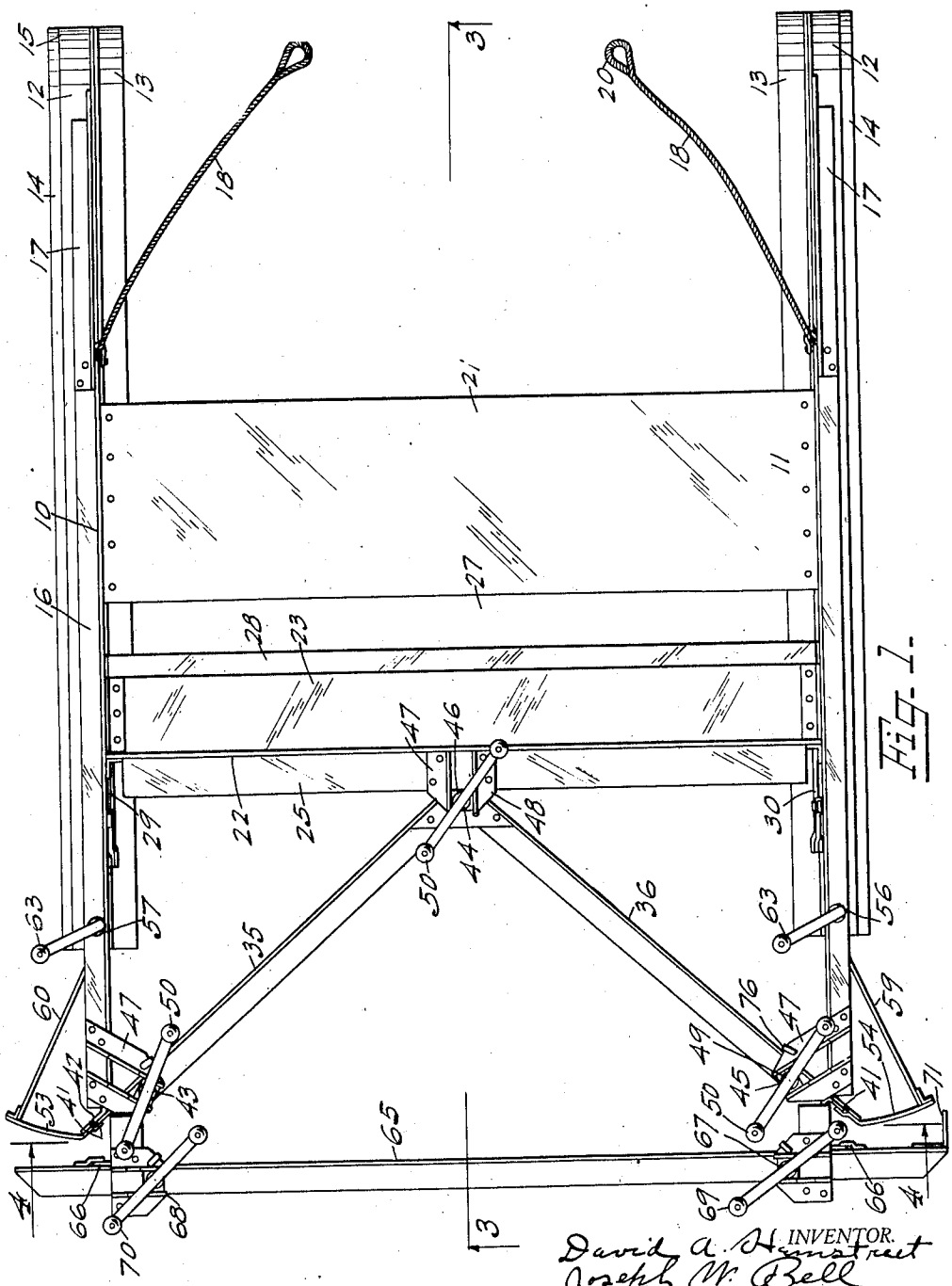


FIG. 1.

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ROAD BUILDING MACHINE

Filed Jan. 9, 1932 3 Sheets-Sheet 2

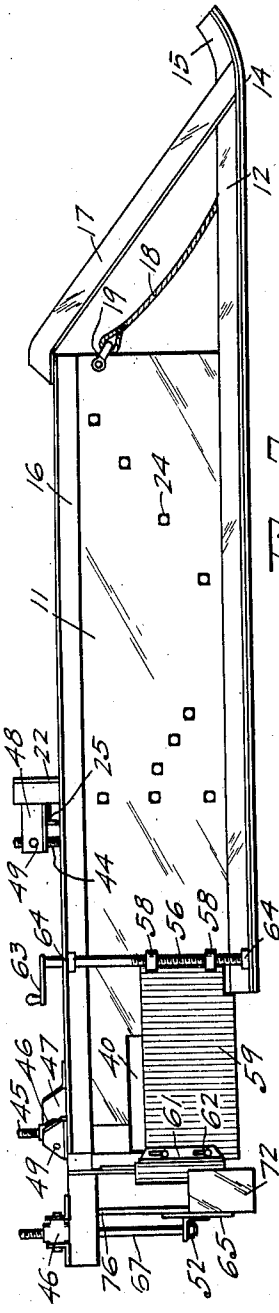


Fig. 2.

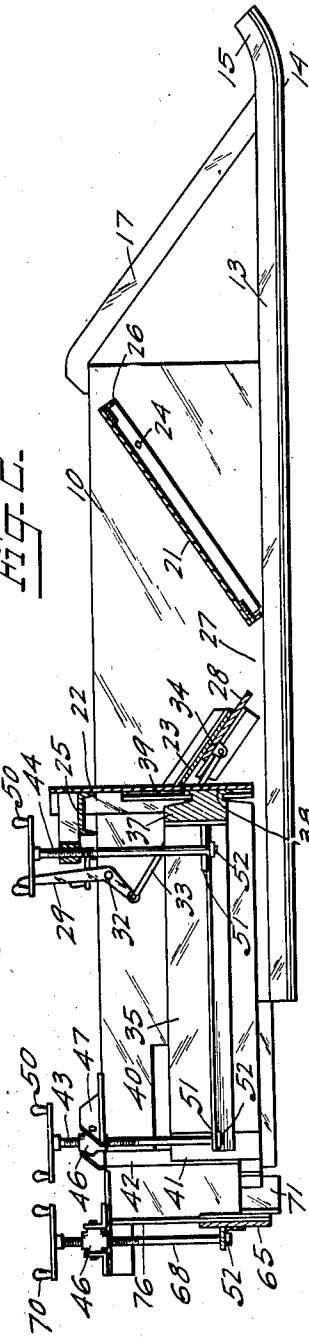


Fig. 3.

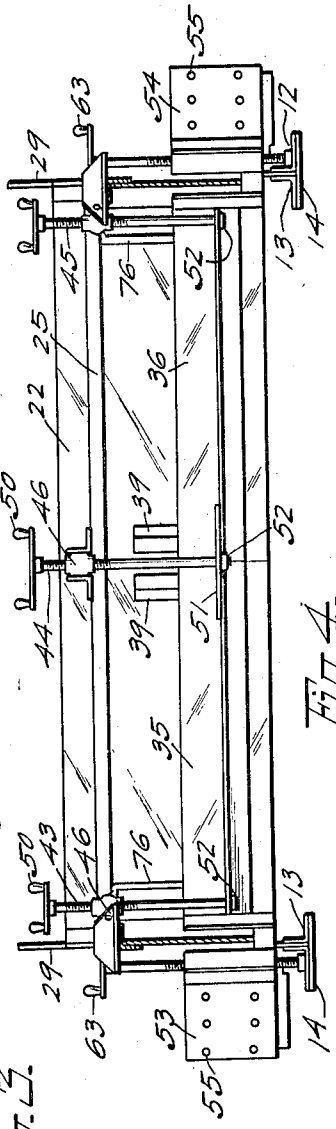


Fig. 4.

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ROAD BUILDING MACHINE

Filed Jan. 9, 1932 3 Sheets-Sheet 3

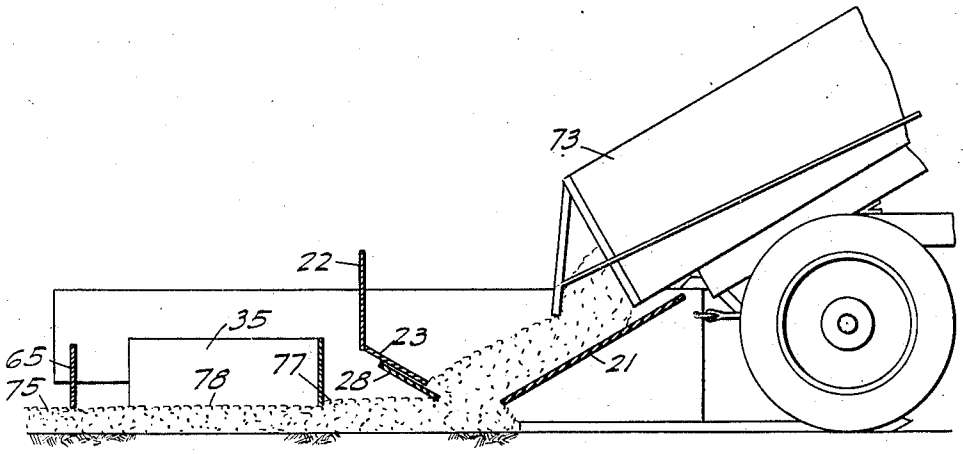


Fig. 5.

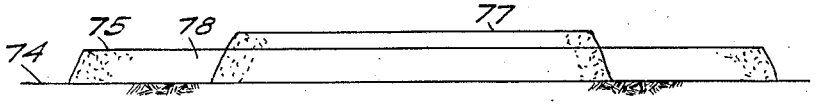


Fig. 6.

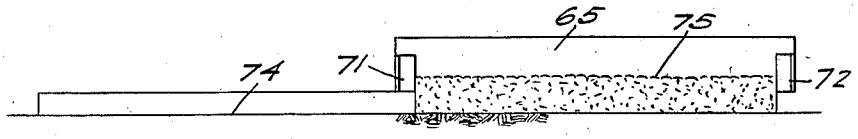


Fig. 7.

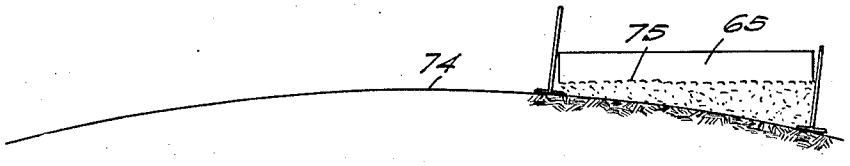


Fig. 8.

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Patented Nov. 6, 1934 1,979,619

UNITED STATES PATENT OFFICE

1,979,619

ROAD BUILDING MACHINE

David A. Hemstreet and Joseph W. Bell,
Marysville, Calif.

Application January 9, 1932, Serial No. 585,730

21 Claims. (Cl. 94—44)

This invention is a road building machine which is particularly adapted to the spreading and bedding of road building material, such as crushed rock, gravel, asphalt and similar material.

The main object of the invention is to provide a device which will uniformly distribute and spread both laterally and longitudinally, road building material ready for finishing and rolling, and which is adjustable to compensate for crown, and also adjustable for width and depth of base or surface material.

Another object of the invention is to provide a drag spreader which is adapted to be drawn by a vehicle from which the spreader receives the supply of material to be distributed and spread and when coupled thereto will be substantially automatic in receiving the material as required.

A further object of the invention is to provide a device of the class described which is cheaply constructed, efficient, and which is of knock-down type and which is readily disassembled or knocked-down for transportation.

Other objects and advantages of the invention will become apparent as the following description is read on the drawings forming a part of this specification and in which similar reference characters are used to indicate similar parts throughout the several views and in which:

Fig. 1 is a plan view of the invention.

Fig. 2 is a side elevation of the invention.

Fig. 3 is a section taken on line 3—3 of Fig. 1.

Fig. 4 is a section taken on line 4—4 of Fig. 1.

Fig. 5 is a diagrammatic view showing the operation of the invention.

Fig. 6 indicates the method of distributing and spreading the material.

Fig. 7 indicates a parallel strip being laid in juxtaposed relation to a rolled strip.

Fig. 8 indicates a strip being laid on a crowned road.

The invention consists primarily of a pair of spaced apart side members provided with skids or runners, and draft elements adapted to be attached to a vehicle which contains a supply of the material to be spread and by which the spreader is to be drawn, a hopper removably supported between the side members and adapted to receive material from the vehicle, and having an adjustably restricted opening in the bottom extending the full distance between the side members, the restricting element on the hopper bottom acting as a gauge for feeding the proper volume of material, an adjustable spreading blade for spreading the material, adjustable edge locating blades for clearly defining the edge of the spread, an adjustable finishing blade for finishing, and gatherers for retracting excess material at the edges, the finishing blade being adjustable for different strip widths and depths.

The side members consist of side plates 10 and 11, each of which are provided with a skid or runner consisting of a pair of oppositely disposed angles 12 and 13 to which is removably secured, a shoe 14 to permit replacement for wear, the forward ends of the skids being curved upwardly as shown at 15. A reinforcing angle 16 is provided along the top edge of the plates 10 and 11. Braces 17 extend from the forward end of the plates 10 and 11 to the forward end of the runners.

Draft elements consisting of a length of chain or cable 18 attached to each side plate by means of a clevis 19 and supplied with a loop or other suitable coupling means 20 for attachment to a motor truck or other draft appliance are provided.

The hopper consists of a sloping front plate 21, a vertical rear plate 22 and a sloping bottom plate 23, all removably secured to the sides 10 and 11 as by bolts 24, suitable reinforcing 25 and 26 being provided to prevent bending of the plates.

Slidably mounted adjacent the bottom plate 23 and in proper relation to adjust the gap 27 is a gauge gate 28 which is indicated as mounted beneath the plate 23. The gate 28 is independently adjustable at the opposite ends to permit proper distribution of material to compensate for difference in elevation of the base, such as is indicated in Fig. 8, and is adjustable by means of levers 29 and 30, which are pivoted to the side plates 10 and 11 as indicated at 32, a connecting rod 33 connecting the lever with gauge gate 28 as indicated at 34.

The spreader consists of a pair of angularly related blades 35 and 36 connected together with a draft member 37 which has a flanged head 38 freely retained and rotatably mounted in a pair of guides 39 secured to the rear surface of plate 22, permitting the spreader to be both vertically and angularly adjusted. The outer ends of the blades extend through openings 40 in the side plates 10 and 11 and are slidably secured by cooperation of a guide member 41 with a gib 42 which is fixed to the side plate.

The spreader is adjustable at the center and both ends, by means of screws 43, 44 and 45, each of which is threadedly mounted in a nut 46 which is pivotally mounted between brackets 47 and 48 as indicated at 49. The upper end of the screws are provided with handles or levers 50 and the

lower end extends through a supporting member as indicated at 51, a nut 52 being secured on the end of the screw and by which the spreader blade is supported.

Fixedly secured to the outer ends of blades 35 and 36 are arcuately formed blades 53 and 54, which are provided with several sets of adjusting holes 55, by means of which the strip width may be regulated. Pivotally and adjustably secured on adjusting screws 56 and 57 as indicated at 58 are baffle plates 59 and 60 as indicated at 62 and having holes in the perpendicular leg adapted to register with holes 55 in member 53 whereby the two members may be adjustably bolted together the other leg having slots for vertical adjustment on plates 59 and 60. Screws 56 are provided with handles or levers 63, the screws being rotatably mounted in bearings 64.

Slidably mounted transversely at the rear end of side plates 10 and 11 is a finishing blade 65 which is secured by means of gibs 66 and vertically adjustable by means of screws 67 and 68 which are similarly mounted to screws 43, 44 and 45 and to which reference may be had for the description. Handles 69 and 70 are provided for operation of these screws.

Adjustably mounted on the outer ends of the finishing blade 65 are gathering members or blades 71 and 72 which are adjustab'e both transversely and vertically on the finishing blade.

The operation of the device is as follows:

The device is coupled onto the rearward end of a motor truck or other suitable transport and/or tractive means, 73, the rear wheels of the truck being interposed between the front portion of skids 12—13, the cables 18 being used as coupling means.

Finishing blade 65 is adjusted by means of screws 67 and 68 to the proper height from the base 74 to provide the required depth of material previous to rolling, as indicated at 75. Gathering blades 71 and 72 are adjusted to the width and depth desired. Spreader blades 35—36 is adjusted to height and finishing blade 65 is adjusted as indicated by suitable indicating gauges 76 which consist of a graduated rod fixed to one of the members, such as the blades, and being readable by registration with a fixed point.

Gate 28 is adjusted to provide the required opening at 27 and wings or baffles 59 and 60 are adjusted on arcuate plates 53 and 54 to the proper width of strip.

Gate 28 is adjusted to what is believed to be the correct gap to provide the required material to form the strip. The material is then fed or dumped into the hopper and the drag drawn forward far enough to ascertain whether the strip is formed correctly as indicated at 75. If the material does not fully form the strip, the gap 27 is increased to supply more material and the other blades are adjusted as may be found necessary.

The spreader is then drawn along, receiving a constant supply of material from the supply 73, which is first deposited as shown at 77 then spread as shown at 78 by spreader blades 35—36 and finally finished and gauged by the finishing blade 65 and gathering blades 71 and 72.

Having described an operable method of constructing and using the invention, it will be noted that variations in construction and arrangement of parts which are consistent with the appended claims may be resorted to without detracting from the spirit or scope of the invention or sacrificing any of the advantages thereof.

We claim:

1. In combination with a road building machine, a hopper provided with a sloping bottom and an opening in the bottom, a gate adapted to coincidently restrict said opening and control the depth of material deposited on a road bed from said hopper, said gate being independently adjustable at each end whereby the volume of material deposited may be varied transversely of a road bed, and the material to be cut through by the gate is proportionate to the height of the gate above the road base and the volume required.

2. In combination with a road building machine adapted to deposit, spread, level and finish road building material, depositing means comprising a hopper extending transversely of the machine and having an opening extending the width of the machine, the bottom plate of said hopper sloping upwardly from said opening to the back wall thereof, a plate slidably mounted in juxtaposed relation to said bottom plate and independently adjustable at its opposite ends, whereby the volume of the deposited material may be gauged to compensate for crown or transverse slope in a road bed, and the slope of the plate restricts the opening coincidental with the adjustment toward the road base, said machine being mounted on skids extending throughout the major portion of the length, whereby irregularities in the supporting surface are compensated for, and uniform distribution and finishing of the material is provided.

3. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and naving a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface to prevent the cutting of superfluous material by the gate and thus reducing the tractive resistance, and spreading and leveling means and finishing means for said material, said means being all independently adjustable at all points of support.

4. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and having a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface to prevent the cutting of superfluous material by the gate, and thus reducing the tractive resistance, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members.

5. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a receiving hopper adapted to receive road building material from a supply

carried by said tractive device, adjustable means for depositing said material in gauged quantity, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members.

6. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a receiving hopper adapted to receive road building material from a supply carried by said tractive device, adjustable means for depositing said material in gauged quantity, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members, said finishing means extending beyond the side members, and width and depth gauging means adjustable vertically and horizontally at each end of the finishing means.

7. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and having a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface to prevent the cutting of superfluous material by the gate, and thus reducing the tractive resistance, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members, said finishing means extending beyond the side members, and width and depth gauging means adjustable vertically and horizontally at each end of the finishing means.

8. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a receiving hopper adapted to receive road building material from a supply carried by said tractive device, adjustable means for depositing said material in gauged quantity, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members, said finishing means extending beyond the side members, and width and depth gauging means adjustable vertically and horizontally at each end of the finishing means, and material gathering means comprising a wing hingedly secured at its forward end in a vertical plane to the outside of each side member, and vertically and radially adjustable, the rearward edge thereof terminating at the heel of the plow when the wing is adjusted to closed position adjacent the side member, whereby material in excess of that required for finishing is gathered at the sides of the road.

9. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and having a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends extending beyond, and independently vertically adjustable and supported by the side members, width and depth gauging means adjustable vertically and horizontally at each end of the finishing means, and material gathering means comprising a wing hingedly secured at its forward end in a vertical plane to the outside of each side member, and vertically and radially adjustable, the rearward edge thereof terminating at the heel of the plow when the wing is adjusted to closed position adjacent the side member, whereby material in excess of that required for finishing is gathered at the sides of the road.

10. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and having a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface to prevent the cutting of superfluous material by the gate, and thus reducing the tractive resistance, and spreading and leveling means and finishing means for said material, said means being all independently adjustable at all points of support, said spreading and leveling means and said finishing means extending exteriorly of said side members, said spreading and leveling means discharging through openings formed in the side members, to permit leveling in juxtaposition to a prelaid strip of material, and, a continuous support for each side member extending from the front of the machine substantially to the forward edge of the opening.

11. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and having a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom

whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface to prevent the cutting of superfluous material by the gate, and thus reducing the tractive resistance, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members, and a continuous shoe formed at the bottom of each side member and projecting forwardly of the front edge thereof, and rearwardly to a point adjacent the opening in the side member adapted to maintain uniformity in leveling and finishing, irrespective of minor irregularities in the road base in the line of travel.

12. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and having a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface, and spreading and leveling means and finishing means for said material, all independently adjustable at all points of support and extending exteriorly of said side members, said spreading and leveling means discharging through openings formed in the side members, to permit leveling in juxtaposition to a pre-laid strip of material, a continuous support for each side member extending from the front of the machine substantially to the forward edge of the opening, and material gathering means comprising the wing hingedly secured at its forward end in a vertical plane to the outside of each side member, and vertically and radially adjustable, the rearward edge thereof terminating at the heel of the plow when the wing is adjusted to closed position adjacent the side member, whereby material in excess of that required for finishing is gathered at the sides of the road.

13. A road building machine comprising a pair of spaced apart side members provided with tractive coupling means, a hopper removably supported between the side members and having a vertical rear wall and a downwardly converging bottom and front wall terminating in a discharge opening, a gate independently adjustable at its opposite ends and operable parallel to the bottom whereby the width of the opening is adjusted coincidently with the height of the gate above the road surface, and spreading and leveling means and finishing means for said material all independently adjustable at all points of support, and extending exteriorly of said side members, said spreading and leveling means discharging through openings formed in the side members, to permit leveling in juxtaposition to a pre-laid strip of material, and material gathering means comprising a wing hingedly secured at its forward end in a vertical plane to the outside of each side member, and vertically and radially adjustable, the rearward edge thereof terminating at the heel of the plow when the wing is adjusted to closed position adjacent the side member, whereby material in excess of that required for finishing is gathered at the sides of the road, and a continuous shoe formed at the bottom of each side member and projecting forwardly of the front edge thereof and rearwardly to a point adjacent the opening in the side member adapted to maintain uniformity in leveling and finishing irrespective of minor irregularities in the road base in the line of travel.

14. A road building machine comprising a pair of spaced apart side members provided with continuous skids and draft elements adapted to be attached to a tractive device containing a supply of road building material to be spread, a hopper removably supported between the side members and adapted to receive material from the tractive device and having a restricted opening extending the full distance between the side members, restricting means for said opening independently adjustable at its opposite ends, a triangular spreader suspended at three points and independently adjustable at each point, the heels of the spreader extending through openings in the side members to permit spreading and leveling outside the side members, a finishing blade independently adjustable at its opposite ends and supported by the side members, an edge locating blade at each end of the finishing blade and adjustable for width and depth to clearly define the edge of the spread, and gatherers for retracting excess material at the edges of the spread and adjustable for width and height of spread.

15. In combination with a road building machine adapted to deposit, spread, level and finish road building material, a hopper, and side members, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members, said finishing means extending beyond the side members, and width and depth gauging means adjustable vertically and horizontally at each end of the finishing means.

16. In combination with a road building machine adapted to deposit, spread, level and finish road building material, a hopper and side members, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members, said finishing means extending beyond the side members, and width and depth gauging means adjustable vertically and horizontally at each end of the finishing means, and material gathering means comprising a wing hingedly secured at its forward end in a vertical plane to the outside of each side member, and vertically and radially adjustable, the rearward edge thereof terminating at the heel of the plow when the wing is adjusted to closed position adjacent the side member, whereby material in excess of that required for finishing is gathered at the sides of the road.

17. In combination with a road building machine adapted to deposit, spread, level and finish

road building material, and having side members, adjustable spreading and leveling means, adjustable finishing means, said spreading and leveling means and said finishing means extending exteriorly of said side members, said spreading and leveling means discharging through openings formed in the side members, to permit leveling in juxtaposition to a pre-laid strip of material, and, a continuous support for each side member extending from the front of the machine substantially to the forward edge of the opening.

18. In combination with a road building machine adapted to deposit, spread, level and finish road building material, and having side members, adjustable spreading and leveling means, adjustable finishing means, said spreading and leveling means and said finishing means extending exteriorly of said side members, said spreading and leveling means discharging through openings formed in the side members, to permit leveling in juxtaposition to a pre-laid strip of material, and, a continuous support for each side member extending from the front of the machine substantially to the forward edge of the opening, and a continuous shoe formed at the bottom of each side member and projecting forwardly of the front edge thereof and rearwardly to a point adjacent the opening in the side member adapted to maintain uniformity in leveling and finishing irrespective of minor irregularities in the road base in the line of travel.

19. In combination with a road building machine adapted to deposit, spread, level and finish road building material, and having a hopper and side members, spreading and leveling means for said material comprising a triangular plow having the apex swivelly secured to the rear wall of the hopper, and vertically adjustable, the heels of the plow being supported by the side members and independently adjustable vertically, and extending through openings in the side members, and finishing means for said material having its opposite ends independently vertically adjustable and supported by the side members, and a continuous shoe formed at the bottom of each side member and projecting forwardly of the front edge thereof and rearwardly to a point adjacent the opening in the side member adapted to maintain uniformity in leveling and finishing irrespective of minor irregularities in the road base in the line of travel.

20. A road building machine, in combination, transport means, a road building material receiving hopper having an adjustable discharge opening, a vertically adjustable spreading and leveling plow, an adjustable finishing blade, adjustable material gathering devices, in cooperative relation to the ends of the plow, width gauging means for said material for defining the edges of the spread and adjustably mounted adjacent the ends of the blade, said machine being adapted for cooperation with a tractive and transport device, and supported on continuous skids throughout the major portion of its length whereby even leveling of material is provided, irrespective of minor irregularities in the road base.

21. A road building machine comprising a hopper having an opening in the bottom thereof, an adjustable gate for restricting said opening and controlling the volume of material deposited therefrom, a spreading device for said material, gathering devices cooperating with the ends of the spreading device, a finishing blade, width gauging means adjustably mounted at the ends of the finishing blade for defining the edges of the spread, said gate, spreading device, gathering devices, finishing blade and width gauging means being independently adjustable at all points of support to permit variation in depth of leveled material transversely of a road bed, said machine being mounted on skids extending throughout the greater portion of the length, whereby irregularities in the supporting surface are compensated for, and uniform distribution provided.

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