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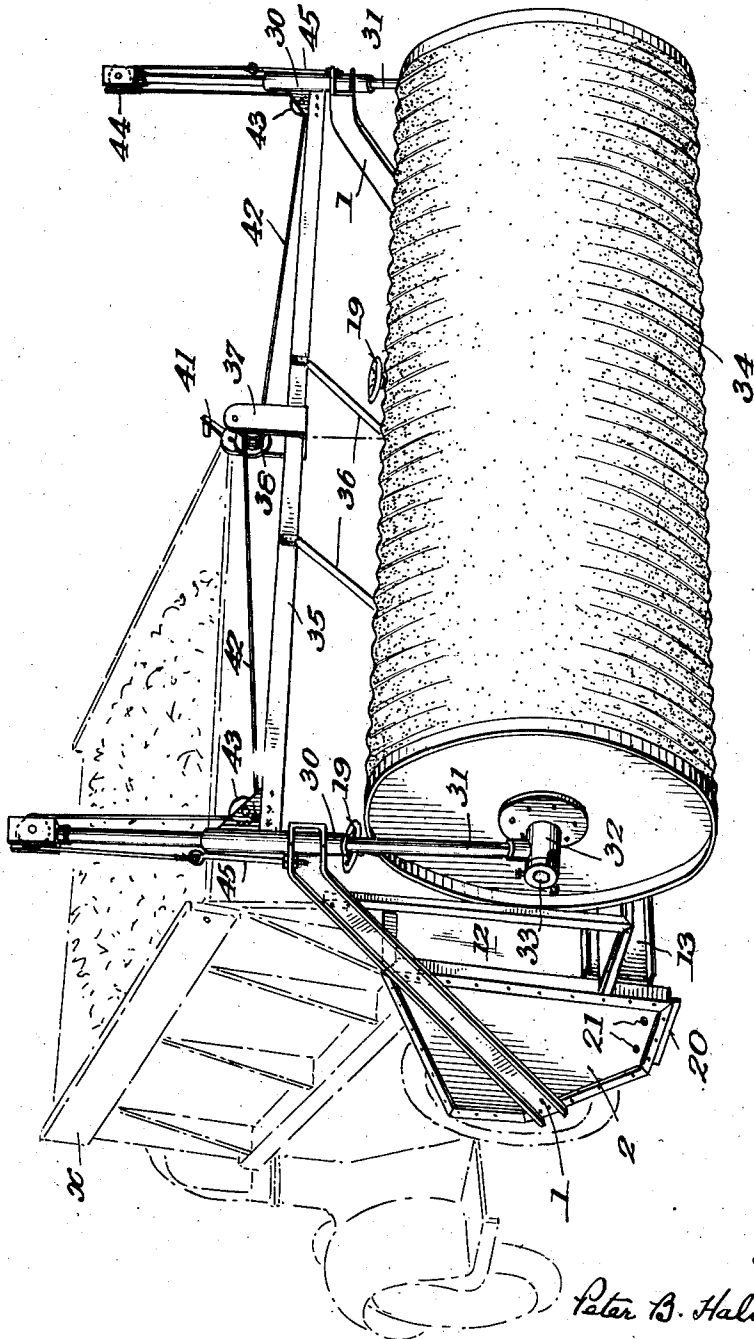
P. B. HALVORSON  
ROAD BUILDING MACHINE

2,258,205

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4 Sheets—Sheet 1

Fig. 1



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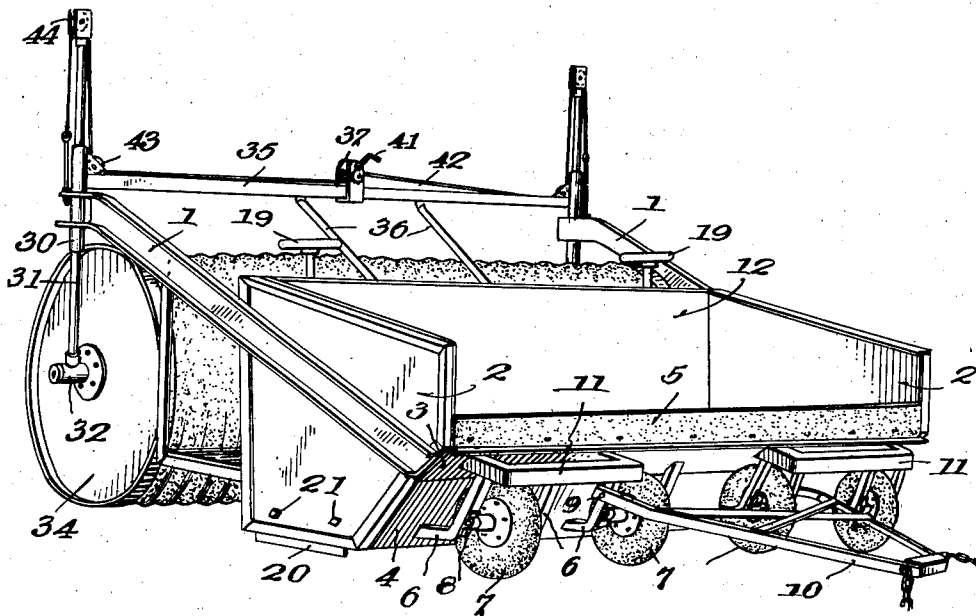
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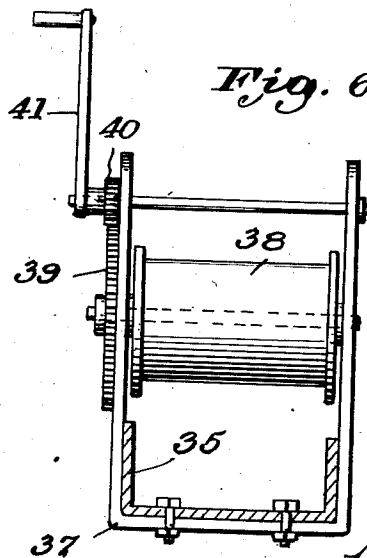
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*Fig. 2*



*Fig. 6*



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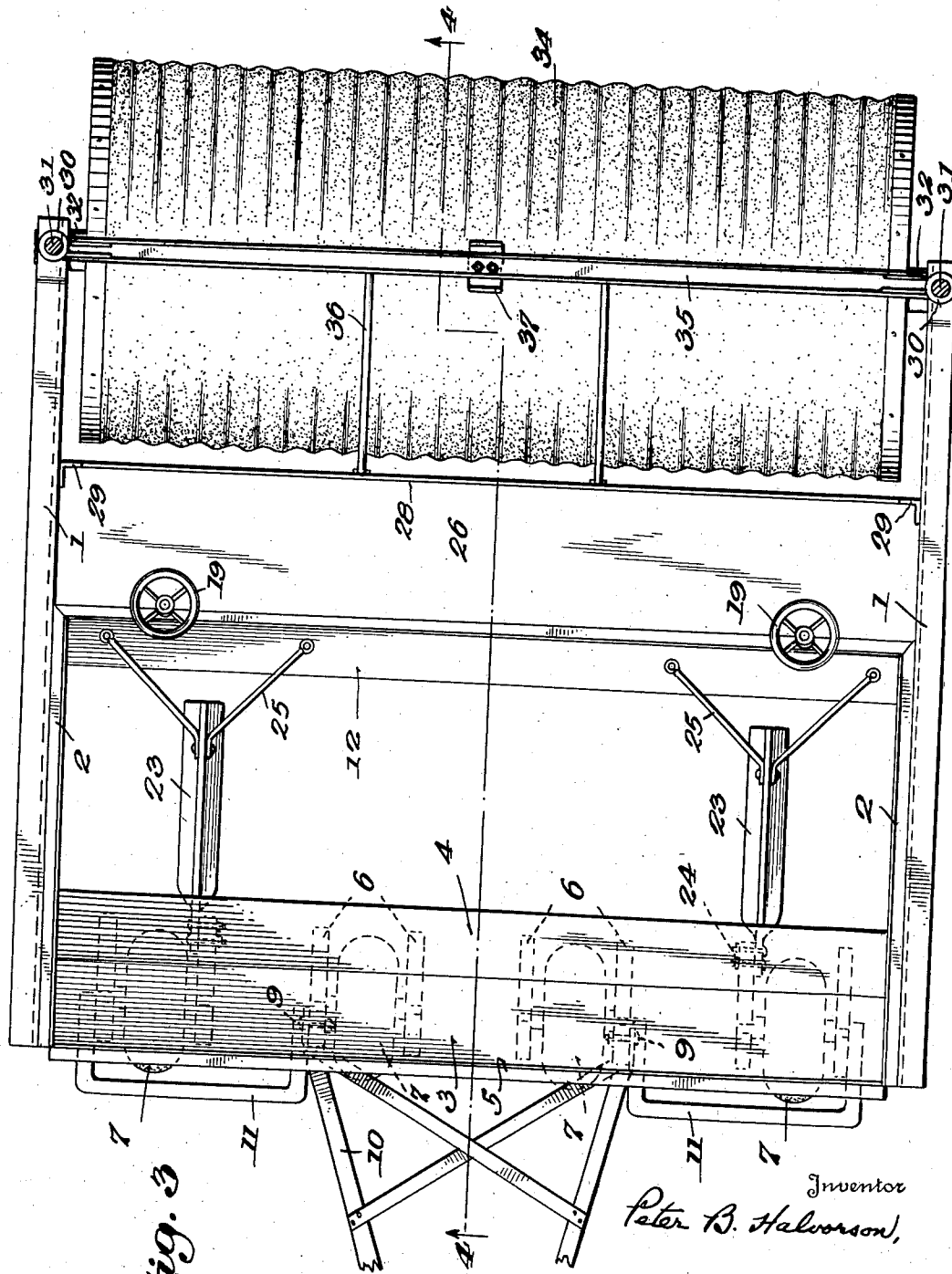


Fig. 3

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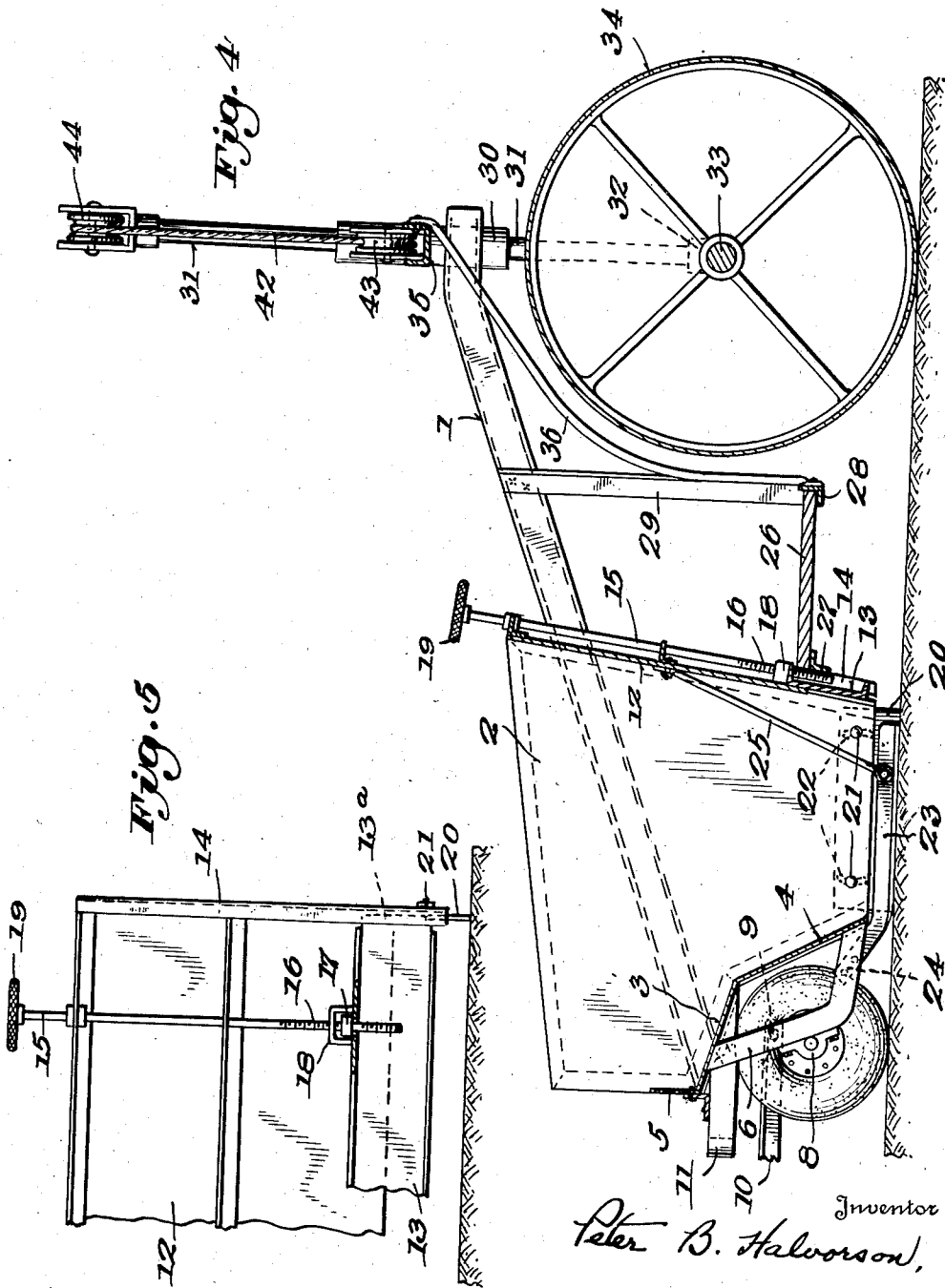
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4 Sheets—Sheet 4



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# UNITED STATES PATENT OFFICE

2,258,205

## ROAD BUILDING MACHINE

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Application January 8, 1940, Serial No. 313,010

7 Claims. (Cl. 94-44)

This invention relates to road machines and more particularly to machines for distributing and levelling broken stone, gravel and the like on roadways.

It has heretofore been proposed to provide apparatus of this general character adapted to be hitched to and drawn behind a dump truck, and at the same time to receive road surfacing material from such truck, whereby the material is distributed in a uniform layer on the road bed.

Among the objects of the present invention are to provide apparatus of this kind in which a roller for tamping or compacting the material is combined with a distributing hopper or spreader in such a manner that the hopper may be adjusted vertically with regard to the roller; to provide such apparatus in which a portion of the weight of the hopper and its contents may be shifted to said roller as desired; to provide means for limiting the downward movement of the hopper so as to prevent its bottom from approaching the roadway too closely; to provide an improved construction of adjustable gate for the hopper, whereby the lower edge of such gate may be angularly disposed, if desired; to provide a machine having an operator's platform, from which platform both the gate adjusting means and the means for raising and lowering the hopper can be operated; and to improve generally upon the details of construction of such apparatus.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter described and claimed, and illustrated in the accompanying drawings, forming part of this specification, and in which:

Fig. 1 is a perspective rear view of my improved road machine, showing in broken lines a dump truck in operative position relative to the same;

Fig. 2 is a front perspective view of the complete machine;

Fig. 3 is a plan view of the machine on a somewhat enlarged scale, parts being in section;

Fig. 4 is a vertical section substantially on the line 4-4 of Fig. 3, looking in the direction of the arrow;

Fig. 5 is a fragmentary rear elevation of the hopper itself, showing the adjustable gate; and

Fig. 6 is an enlarged elevational view showing one form of winding drum which I may employ for raising and lowering the hopper.

Referring to the drawings in detail, my improved machine comprises a pair of longitudinally extending side frame members 1, shown as

channel irons. Mounted between these side members, adjacent one end, is an open bottom hopper having substantially vertical end walls 2. The front wall preferably comprises two portions 3 and 4, disposed at an angle to each other, as shown in Fig. 4, and above the portion 3 is a vertically extending wall 5. This is preferably formed of resilient flexible sheet material such as belting, consisting of canvas or canvas and rubber.

Secured to the walls 3 and 4, on the outside thereof, are pairs of brackets 6, and between each pair of such brackets is mounted a supporting wheel 7, journaled in bearings 8. These wheels provide a support at the forward end of the hopper and are shown as equipped with pneumatic tires. Any desired number may be employed, but in the drawings I have illustrated four.

Pivoted to two of the brackets 6, as at 9, is a suitable tongue or hitch 10, which may be of any desired construction, and constitutes the means by which the machine may be attached to a truck.

Attached to the front wall 3 of the hopper, as by welding, are a pair of U-shaped bumpers 11, which project forwardly from said wall and overhang the wheels 7. These bumpers serve to engage the wheels of a truck *x*, when backed up to the position shown in Fig. 1 for the purpose of dumping road material into the hopper, so as to limit the movement of the truck toward the road machine.

Referring to Fig. 4, it will be seen that the hopper is provided with a rear wall 12, shown as set at a slight angle to the vertical. This wall terminates at its lower edge a considerable distance above the plane of the bottom of the hopper, and the space between the lower edge of the wall 12 and the bottom of the hopper is closed by a vertically adjustable sliding gate 13. This gate preferably consists of a wide channel member, the flanges of which are cut away at the ends to provide tongues 13<sup>a</sup>, which slidably engage behind guide members 14, one of which is secured to and spaced slightly from the rear wall 2 of the hopper at each side, as shown in Fig. 5.

The gate 13 is adjusted by means of a pair of operating shafts 15, supported by and journaled in the rear wall of the hopper. Each of the shafts has a threaded lower end 16 working through a nut 17, which nut is loosely held within a cage 18, secured as by welding, to the gate. The lower end of the shaft passes freely through an enlarged opening in the flange of the gate.

A hand wheel 19 is secured to the top of each shaft, by which it may be rotated.

By virtue of employing an independent adjusting device at each end of the gate, and also by virtue of the loose connection between each shaft 15 and the gate, as above described, it is possible to raise and lower each end of the gate independently, and to raise one end higher than the other, so that the lower edge of the gate may be disposed at an angle, if it is desired to spread the material in such a manner that the layer shall be thicker at one side than the other.

Secured to and projecting below the lower edge of each end wall 2 of the hopper is a plate or extension 20, as clearly shown in Figs. 1, 4 and 5. This plate is secured to the hopper by means of bolts 21, passing through slots 22 in the plate, whereby the plate may be adjusted vertically and set at different heights, as required. When in its lowered position, as shown in Figs. 4 and 5, the material being applied is prevented from spreading laterally beyond the hopper, while if the plate is raised, such material may flow out beyond the sides of the hopper.

A feature of the invention consists in the use of supporting shoes or runners for maintaining the bottom of the hopper at a minimum distance from the roadway. As shown in Figs. 3 and 4, two of these shoes 23 are provided, one disposed adjacent each side of the hopper, the shoes being turned up at their forward end and rigidly secured to the brackets 6, as at 24. The rear ends of the shoes are rigidly connected with the rear wall 12 of the hopper by means of pairs of brace rods 25.

An operating platform 26 is mounted adjacent the rear side of the hopper, such platform being supported at one edge by an angle iron 27, secured to the guide pieces 14, and at its other edge by an angle iron 28, which in turn is suspended at its ends from the frame members 1 by means of hangers 29. The parts are so positioned that an operator standing upon the platform 26 may conveniently grasp and turn the hand wheels 19.

The side frame members 1, as above mentioned, are preferably in the form of channel beams. These extend back a substantial distance behind the hopper and are bent at their rear ends into substantially horizontal position and such ends are secured as by welding to sleeves 30. As shown, these sleeves extend through openings in the flanges of the channels.

The sleeves 30 are slidably mounted upon vertical posts 31, supported at their lower ends in bearings 32, in which bearings are journaled the shaft 33 of a relatively large roller 34, spaced a considerable distance back of the hopper and having a length substantially equal to the width of the hopper. This roller is preferably corrugated as shown, and is also preferably covered with a layer of dense rubberized canvas or the like. The corrugations prevent side slip of the roller, especially when banking for curves, and I have found that, by covering the roller with rubberized canvas, the tendency to pick up and lift out parts of the road material is eliminated, and the rolled surface is left intact and unbroken.

The sleeves 30 are rigidly united by a cross beam 35, preferably of channel section, and additional brace rods 36 preferably connect this beam with the platform 26, as shown in Figs. 1 and 4.

Secured to the center of the beam 35 is a hoisting device or winch comprising a frame 37, in which is journaled a roller 38. As shown in Fig. 6, this roller preferably carries a gear 39, 75

which meshes with a pinion 40 on a jack shaft, operated by a handle 41.

A pair of cables 42 are wound upon the drum 38, and extend out toward the ends of the beam 35, where they pass upwardly around pulleys 43 and then downwardly over pulleys 44, mounted at the upper ends of the posts 31. The lower ends of the cables 42 are secured to eye-bolts 45, which in turn are fastened to the side frame members 1. Thus by turning the crank 41, the cables 42 may be wound to a greater or less extent upon the drum 38, and thus the frame members 1 and associated sleeves 30 may be raised or lowered relative to the posts 31. When the sleeves 30 are raised, this results, of course, in lifting the entire hopper so as to increase the distance between the bottom thereof and the roadway. The crank 41 is so positioned that it may be conveniently grasped and turned by an operator standing upon the platform 26, this platform, as shown in Fig. 4, being interposed directly in the space between the hopper and roller 34.

From the foregoing, it will be understood that in use, a dump truck is backed up to the machine, as shown in dotted lines in Fig. 1, and the surfacing material contained in the truck deposited in the hopper until the latter is filled to the desired extent. The road machine is then coupled to the truck by means of the hitch 10, and as the truck moves forward, the machine is dragged behind it, depositing the gravel or other material on the surface of the roadway in a uniform layer, the material being continuously deposited from the truck into the hopper, as it is discharged from the latter. The thickness of the layer may be controlled by manipulating the gate 13, and, as above mentioned, by tilting this gate to an angular position, the layer may be made thicker at one side than the other, if desired.

The roller 34 serves to effectively tamp and compact the material. When the sleeves 30 and frames 1 are in their lowermost position, the shoes or runners 23 rest upon the ground, as shown in Fig. 4, and relatively little weight is carried by the roller 34. If, however, it is desired to apply more weight to the roller, the operator turns the crank 41, thus hoisting the sleeves 30, and lifting the hopper somewhat. This results in transferring to the roller a greater portion of the weight of the hopper and of the road material contained therein. Thus any desired portion of the weight of the hopper and contents may be transferred to the roller 34, as required.

What I claim is:

1. A road building machine comprising a frame, an open bottom hopper secured to the frame, supporting means for the hopper at one end of the frame, a supporting roller at the other end of said frame and spaced from the hopper, an operator's platform suspended below said frame between said hopper and roller, and adjustable lifting means between said frame and roller and operable from said platform for regulating the elevation of said hopper.

2. A road building machine comprising a frame, an open bottom hopper secured to the frame, supporting means for the hopper at one end of the frame, a supporting roller at the other end of said frame and spaced from the hopper, an adjustable gate mounted on the wall of the hopper adjacent said roller, a platform suspended from said frame and disposed between said hopper and roller, and screw means operable from said platform for adjusting the position of said gate.

3. A road building machine comprising an open bottom hopper, a supporting roller having a length substantially equal to the width of said hopper and disposed beyond one side thereof, means in addition to and spaced from said roller for supporting said hopper, and non-resilient lifting means associated with said roller whereby a greater or smaller part of the weight of said hopper and contents may be transferred from said last mentioned supporting means to said roller, as desired.

4. A road building machine comprising, in combination, an open bottom hopper, supporting means at the forward end of said hopper, a rigid frame extending rearwardly from said hopper, a combined supporting and road compacting roller carried by said frame and having a length substantially equal to the width of said hopper, and lifting means supported by the roller for adjusting said frame vertically with respect to said roller.

5. A road building machine comprising, in combination, an open bottom hopper, supporting means at the forward side of said hopper, a rigid frame extending rearwardly from said hopper, a combined supporting and road compacting roller carried by said frame and having a length substantially equal to the width of said hopper, said roller being spaced a substantial distance

from said hopper, and an operator's platform suspended below said frame and disposed in the space between said roller and hopper.

6. In a machine of the character described, an open bottom hopper, means at the front of the hopper for pivotally supporting the same, a pair of spaced shoes rigidly secured to the hopper and located one adjacent each end thereof, said shoes projecting below the plane of the bottom of the hopper and constituting stops to limit the downward movement thereof, roller means spaced from said shoes for supporting the rear end of the hopper, and adjustable means cooperating with said roller means for lifting said hopper about said front pivotal support so as to raise said shoes out of contact with the roadway when desired.

7. In a machine of the character described, an open bottom hopper supporting means at both the front and rear of the hopper, adjustable means positioned between the hopper and one of said supporting means for moving said hopper in a vertical plane, and a pair of transversely spaced, parallel, longitudinally extending guide shoes shorter than the hopper and rigidly secured thereto at a point between said supporting means, said shoes projecting below the plane of the bottom of the hopper and serving to limit the downward movement of said hopper.

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