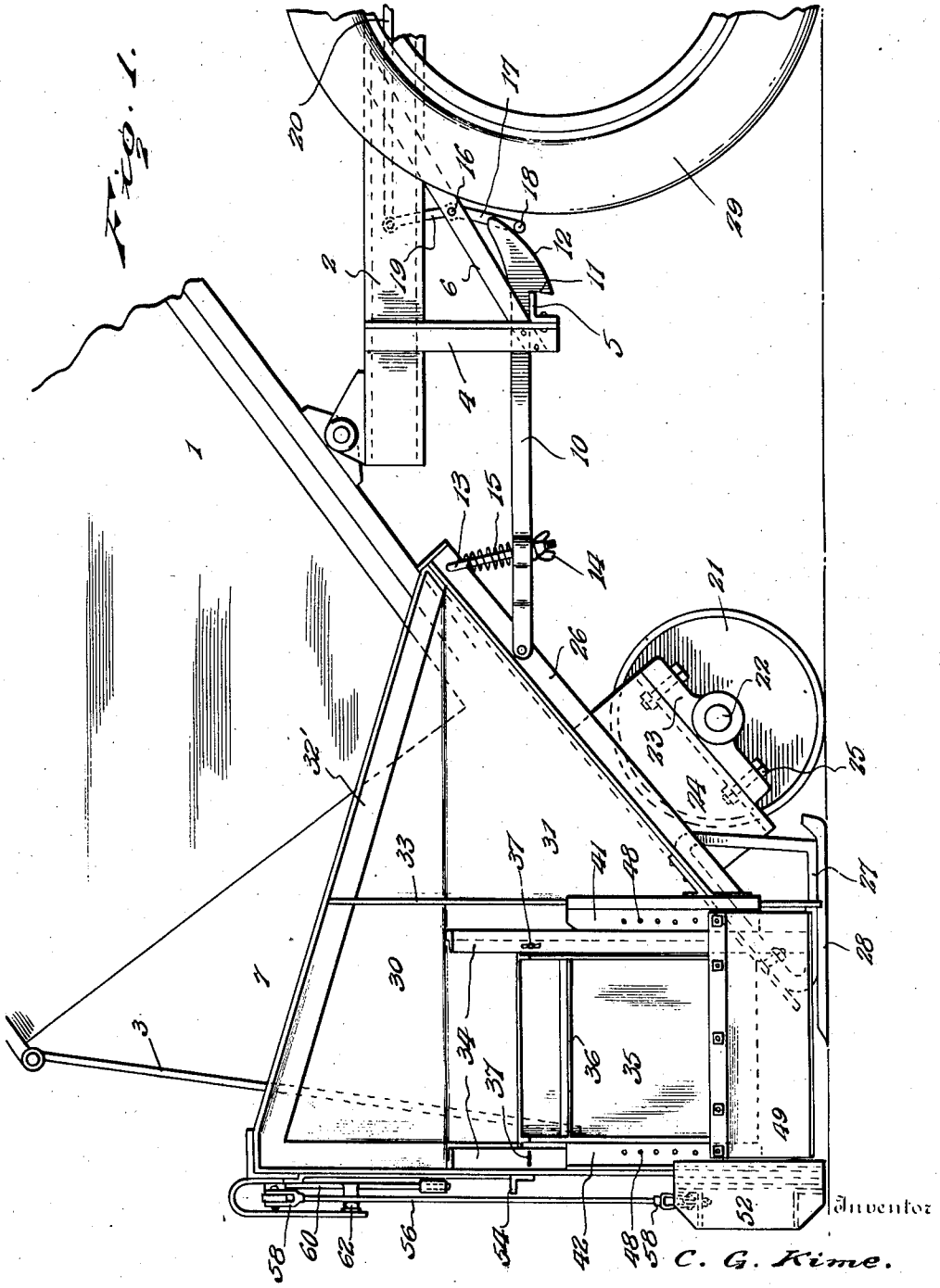
June 24, 1930. C. G. KIME 1,767,243

ASPHALT SPREADER

Filed July 12, 1928 5 Sheets-Sheet 1

Fig. 1.



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ASPHALT SPREADER

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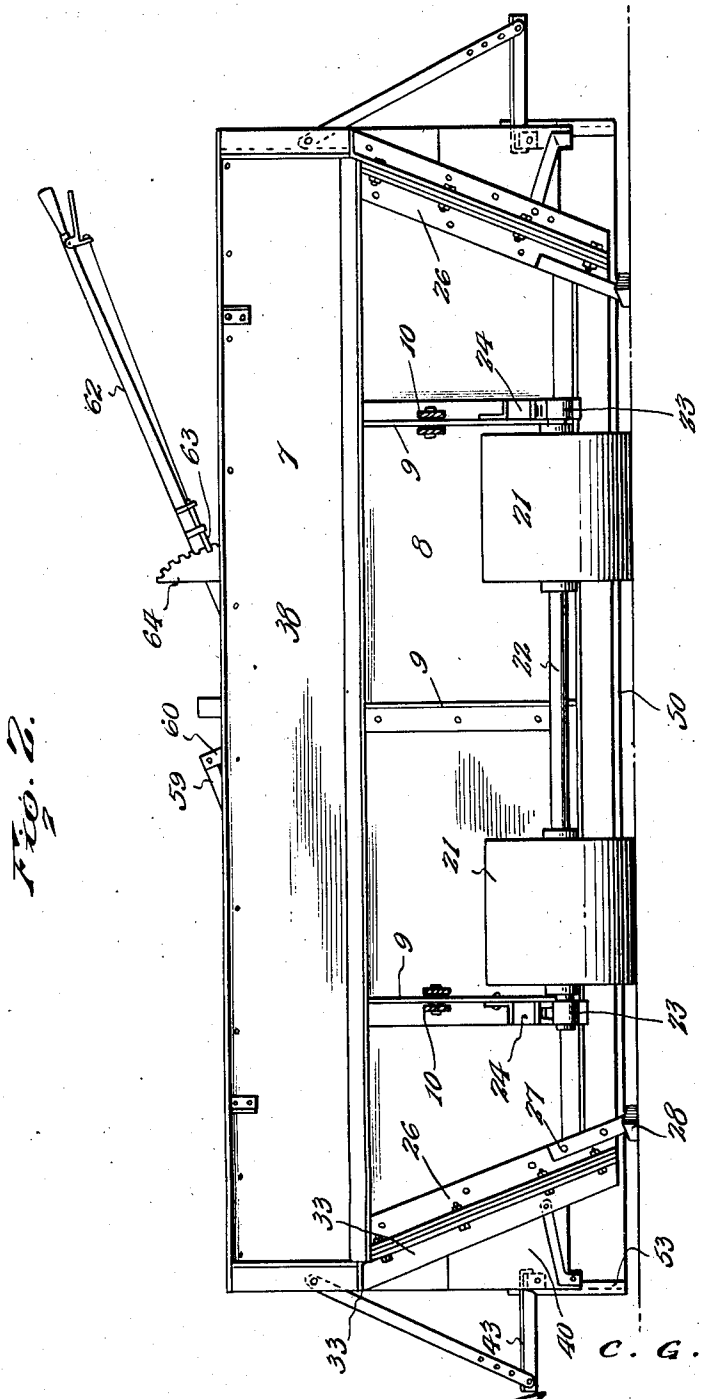

Fig. 2.

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ASPHALT SPREADER

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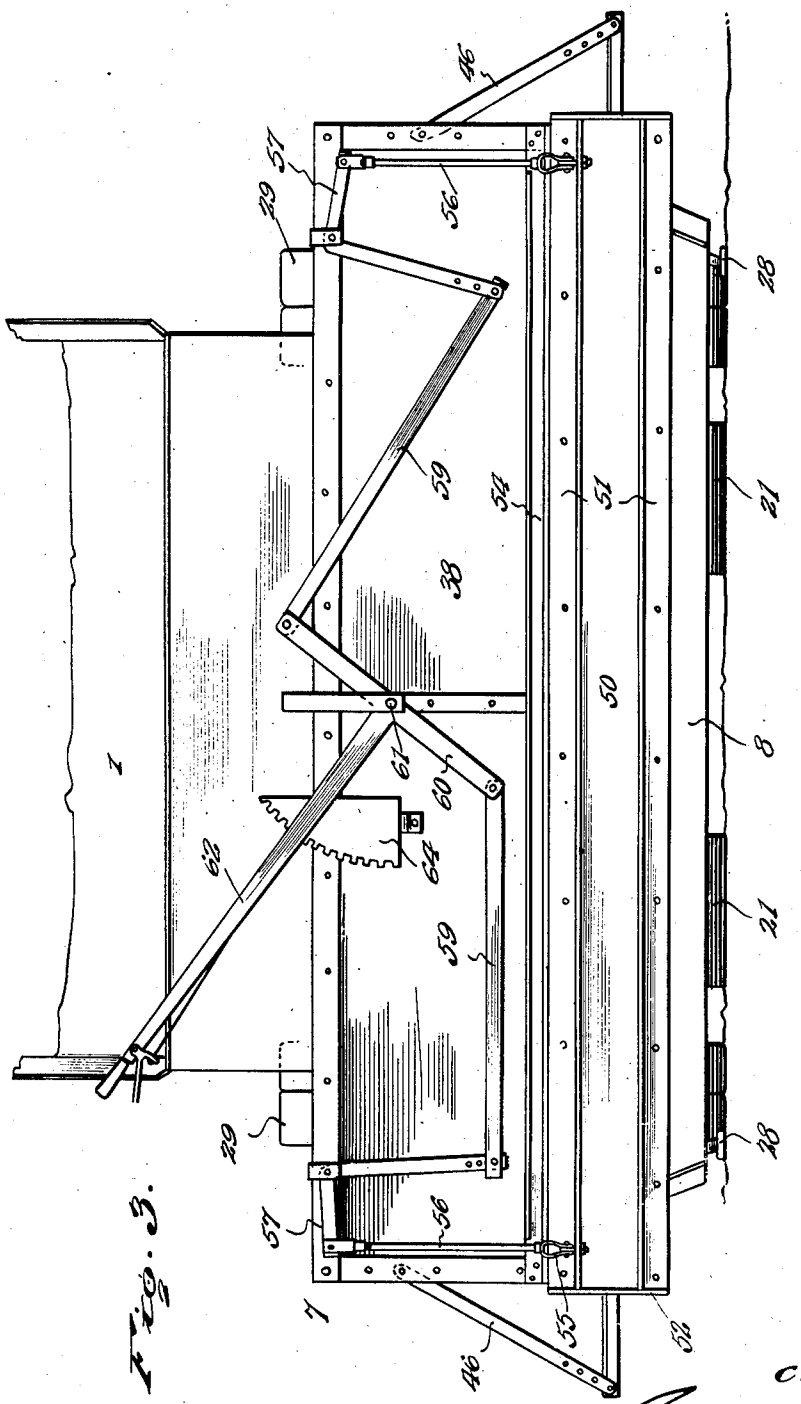

Fig. 3.

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ASPHALT SPREADER

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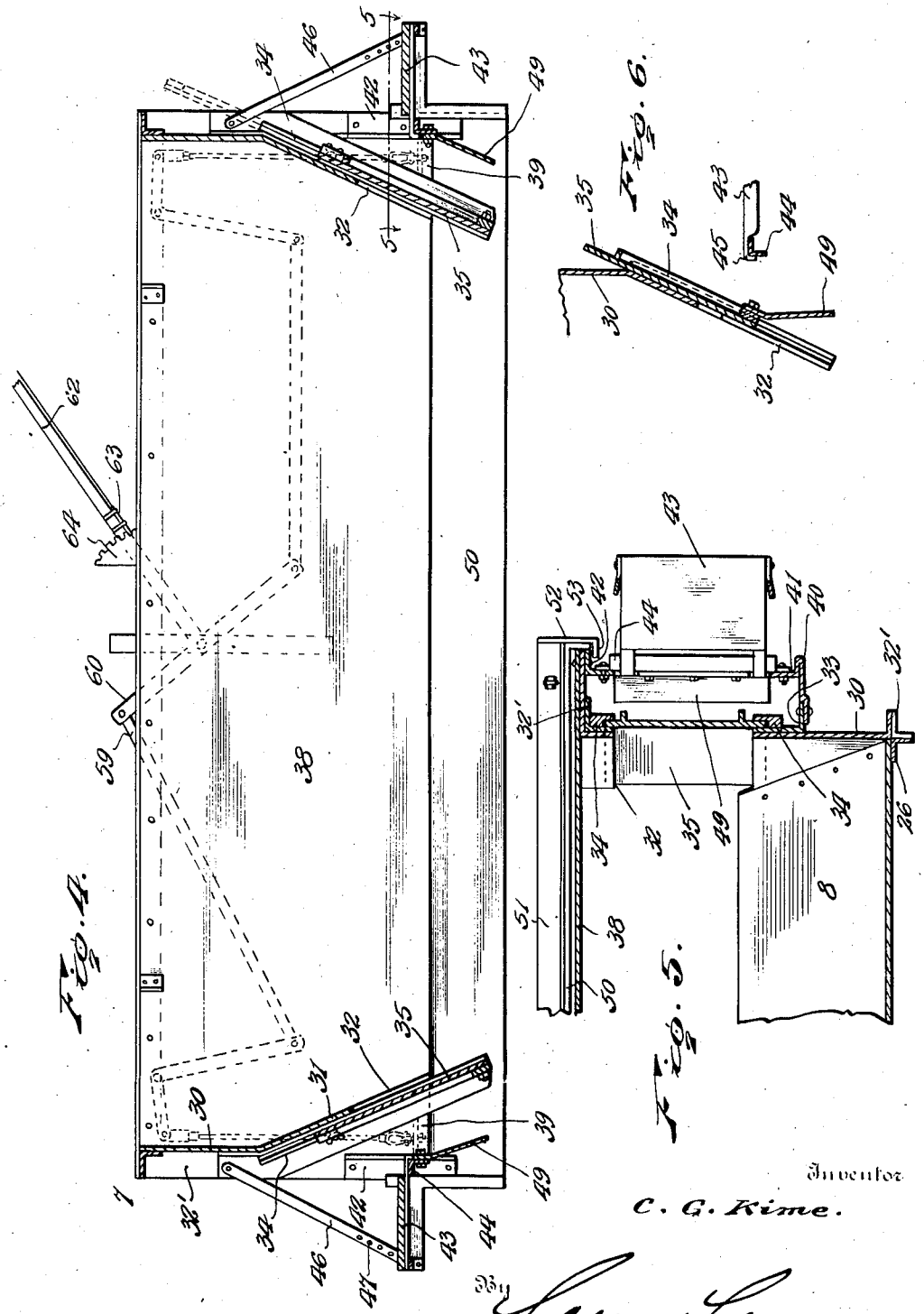

Fig. 4.

Fig. 6.

Fig. 5.

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ASPHALT SPREADER

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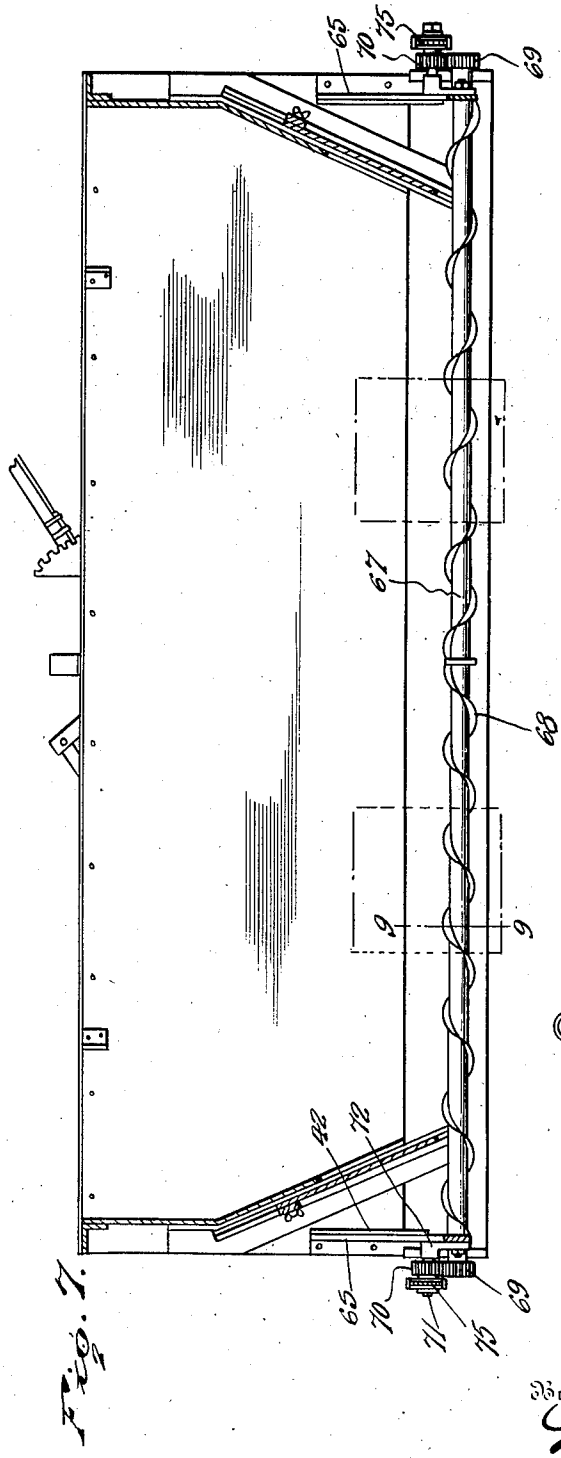

Fig. 7.

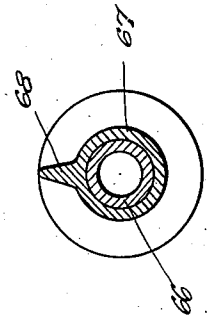

Fig. 9.

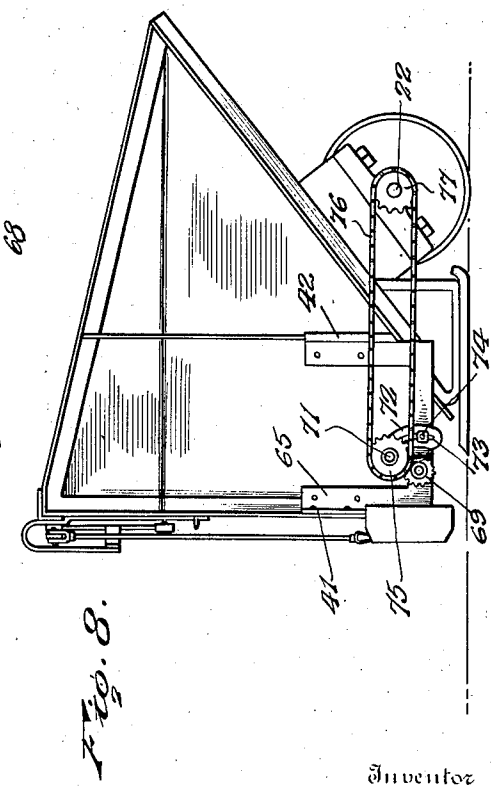

Fig. 8.

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UNITED STATES PATENT OFFICE

CHARLES G. KIME, OF CRESTLINE, OHIO, ASSIGNOR TO THE BURCH CORPORATION, OF CRESTLINE, OHIO, A CORPORATION OF OHIO.

ASPHALT SPREADER

Application filed July 12, 1928. Serial No. 292,224.

This invention relates to means for spreading road material and particularly to that type of road machines which consists essentially of an open bottom hopper provided with means for attachment to a dumping body vehicle to be drawn over the road by the vehicle and spread the material during travel as the material flows from the vehicle. The present invention is designed more particularly for spreading asphalt, and has for its object the provision of means whereby the width of the spread may be regulated as well as the depth thereof. The invention also has for its object the provision of simple and efficient means for supporting an operator in position to maintain the material in a loose condition so that it will readily flow from the hopper, and another object of the invention is to provide means whereby the hopper may be automatically coupled to the truck and easily released therefrom. Other objects of the invention will appear incidentally in the course of the following description, and the invention resides in certain novel features which will be particularly pointed out in the appended claims.

In the drawings:

Figure 1 is a side elevation showing my improved spreader with a portion of the rear end of a truck to which it is coupled;

Fig. 2 is a front elevation of the spreader;

Fig. 3 is a rear elevation of the same;

Fig. 4 is a transverse section of the spreader looking toward the rear;

Fig. 5 is an enlarged horizontal section on the line 5—5 of Fig. 4;

Fig. 6 is a detail;

Fig. 7 is a section showing an agitator;

Fig. 8 is an end view of the same, and

Fig. 9 is a detail transverse section of the agitator.

In the drawings, the reference numeral 1 indicates a portion of the dumping body of a motor truck and 2 indicates a portion of the rear end of the truck frame or chassis upon which the body is hingedly mounted, the body being equipped with an end gate 3 which may swing outwardly to permit discharge of material when the body is swung to dumping position. In the present instance, hangers 4 are secured to the sills of the chassis 2 adjacent the rear end thereof, and a cross bar 5 is secured to and extends between the lower ends of these hangers, the hangers being reinforced by braces 6 extending forwardly therefrom to the sills, as shown. The hopper or body 7 of the spreader has a downwardly and rearwardly inclined front wall 8 upon the front side of which are reinforcing angle bars 9, as shown and as will be understood. To the outer reinforcing bars 9 are pivoted the rear ends of draft bars 10 which extend forwardly and have their front ends formed into hooks 11 with beveled forward lower edges 12 whereby if the truck be backed toward the hopper the front ends of these drafts bars will be caused to ride over the cross bar 5 and drop into engagement therewith, as shown in Fig. 1. Pivotally hung upon the reinforcements 9 above the draft bars 10 are suspension rods 13 which pass through the draft bars and are equipped with wing nuts 14 below the bars adapted to bear against the under sides thereof and thereby support the bars against dropping. Springs 15 are arranged around these suspension rods between the draft bars and the respective reinforcements 9 so that, while the draft bars may yield to ride over the cross bar 5, they will be held downwardly to and in engagement with the said bar when the apparatus is in use. To effect release of the draft bars, a rock shaft 16 is mounted in the braces 6 and is equipped with a depending crank arm 17 having its lower end disposed to engage below the draft hooks, as indicated at 18. A similar crank arm 19 rises from the rock shaft and is pivoted to an operating rod 20 which extends forwardly to a point near the operator's seat of the truck where it may be equipped with a lever or other manipulating device. If the crank 17 be swung upwardly and rearwardly, the hooks 11 will be lifted from the cross bar 5 so that the truck may then be driven forward away from the hopper.

The hopper is supported by rollers 21 mounted upon a shaft 22 which is journaled

in bearings 23, the bearings being in turn bolted to blocks 24 which are secured to the outer reinforcements 9 upon the front wall of the hopper. The blocks 24 may be of any convenient form which will permit of the provision of a plurality of openings through the lower front wall of the same to receive the bolts 25 which secure the bearings 23 thereto, and it will be understood that by engaging the bolts through selected openings the rollers may be set at a relatively higher or lower point of the hopper so that the bottom of the hopper will be disposed at a greater or less height above the ground surface and the depth of the spread may be thereby regulated approximately. As previously stated, the front wall 8 of the hopper is inclined downwardly and rearwardly and its end or side edges are also inclined downwardly and inwardly and reinforcing angle bars 26 are secured thereto. At the lower ends of the reinforcements 26 substantially triangular brackets 27 are secured thereto and shoes 28 are secured to the under sides of these brackets to run upon the ground and furnish additional supports for the hopper. The brackets 27 are adjustable upon the reinforcements 26 in substantially the same manner as the rollers 21 are adjusted so as to provide for an approximate regulation of the depth of the spread, and it will be noted that the shoes extend rearwardly beyond the lower edge of the front wall 8, thereby imparting additional stability to the device and guarding against tipping backwardly of the same. The rollers 21 are intended to run in paths at the inner sides of the truck wheels 29 while the shoes 28 are intended to run in paths following the outer sides of the truck wheels, thereby tending to obliterate any ruts which might be formed in the sub-grade of the road by the truck wheels and contributing to an even deposit of the road material.

The end walls 30 of the hopper are disposed vertically in their upper portions and in their lower portions are inclined inwardly and downwardly, as shown at 31, the lower extremities of the end walls immediately at the rear of the front wall having end discharge openings 32 formed therethrough. The upper and rear edges of the end walls are reinforced by angle bars or strap bars 32′ and a flange 33 is also secured upon the outer side of an end wall to extend down to the lower edge of the front wall. Upon the outer side of each end wall at opposite sides of the openings 32 therethrough are secured cleats 34 which receive the side edges of an end gate 35 consisting of a plate of metal of suitable dimensions slidably supported by the said cleats, and reinforcing bars or ribs 36 are provided upon the outer sides of the gate. The gates are obviously adjustable vertically relative to the cleats 34 and may be, therefore, set to entirely cover the respective openings 32 or partially or entirely uncover the same and they are held in their set positions by set bolts 37 mounted in the cleats and adapted to bear against the gates at the edges of the same, as will be understood.

The back wall 38 of the hopper has its lower edge disposed at a higher elevation than the lower edge of the front wall and its lower corners are extended laterally beyond the end walls, as shown most clearly at 39 in Fig. 4, and it may be noted at this point that the upper edges of the end walls are inclined downwardly from the top of the back wall to the top of the front wall, this formation being desirable to permit closer observation of the flow of material from the truck body into the hopper. Secured to the flange 33 is a laterally projecting guard plate 40 having its outer edge portion doubled on itself and turned rearwardly, as indicated at 41, while an angle bar 42 is secured to the reinforcement 32′ and to the back wall to cooperate with the plate 41 in supporting a platform 43 upon which an operator may stand. A cross bar 44 is secured to and extends between the elements 41 and 42 and the inner edge of the platform is formed with a hook 45 which is adapted to engage over said cross bar, as shown most clearly in Fig. 6. The outer end of the platform is pivoted to and disposed between hangers 46 which are pivoted at their upper ends upon the flange 32 and the outstanding flange of the rear portion of the reinforcement 32′. If the platforms are not to be used, they may be disengaged from the cross bar 44 and then swung about their pivotal connections with the hangers to fold between the latter after which the hangers and the platforms may be swung toward the end walls of the hopper to be carried in a vertical position thereby out of the way. This disposition of the platforms will be advantageous when the hopper is to be transported over a road without spreading material or is to be stored or moved through narrow passageways. It is also to be noted that the lower ends of the hangers 46 are provided with longitudinal series of openings 47 through any one of which the pivot bolt may be inserted so that the platforms may be set at a greater or lesser height. The cross bar 44 is also adjustable vertically by having the securing bolts at the ends of the same inserted through any one of the openings 48 in the elements 41 and 42, as will be understood.

When the gates 35 are in their lowest positions, as shown in Fig. 4, the material will be laid in the narrowest spread for which the machine is adapted and inasmuch as this spread is obviously considerably less than the width of the hopper, the arrangement adapts the device particularly for use upon narrow roads. If the end gates be raised

more or less, the spread will be correspondingly increased, and it may be further regulated by the employment of an element 49 which I call a fence and which consists of a plate having its upper edge in angular relation to its main portion so that it may be secured to the lower edge of the gate, as shown in Fig. 6, the material passing through the discharge opening 32 impinging against the fence and being thereby restricted in its spread so that it will drop to the road surface to cover the same to the desired width. The fence is detachably secured to the gate and it may be secured to the cross bar 44, as shown in Fig. 4, to extend inwardly from said bar, as shown in full lines, or reversed so as to extend outwardly from said bar, as indicated by the dotted lines thereby adapting the machine to spread greater widths of material than when it is in the previously described positions, the several adjustments indicated being sufficient to meet the requirements of all present standard road constructions.

Slidably mounted upon the back wall of the hopper is a back gate 50 which consists of a metallic plate having reinforcing angle bars 51 secured upon its outer side along its upper and lower edges and having end reinforcements or wings 52 secured to its ends, the forward edges of these wings or end reinforcements being extended forwardly and then projecting inwardly to provide retaining flanges 53 engaging the front sides of the elements 42 so that the back gate will be enabled to withstand the thrust put upon the same by the outflowing material. It may also be noted that across the lower portion of the back wall is secured a reinforcing angle bar 54 which strengthens the back wall and also serves as a stop to limit the upward adjustment of the back gate. In the upper reinforcement 51 of the gate adjacent the ends thereof, are firmly secured eyes or hooks 55 in which are engaged the lower ends of hangers 56 which at their upper ends have threaded engagement with angle levers 57 fulcrumed at their angles upon the rear wall of the hopper adjacent the upper corners of the same. The hangers 56 are threaded at their ends into eyes 58 whereby the effective length thereof may be varied and the gate set at an inclination transversely of the hopper when desired in order that a crown may be formed on the road. The inner arms of the angle levers 57 extend downwardly and are pivoted at their lower ends to the outer ends of links 59 which extend inwardly and are pivoted at their inner ends to the opposite ends of an intermediate lever 60 fulcrumed at its center upon the rear wall of the hopper, as indicated at 61. Extending from the lever 60 at the center of the same is a handle 62 equipped with a latch 63 adapted to engage a holding rack 64 secured upon the hopper so that the lever may be held in a set position. By properly rocking the hand lever, the back gate may be adjusted to project more or less below the lower edge of the rear wall of the hopper and thereby control accurately the depth of the spread as well as leveling off the upper surface of the same. The back gate is preferably adjusted before the travel of the hopper over the road surface begins but the parts are so arranged and the handle 62 is of such length that if necessary the adjustment may be varied as the work progresses so that any choking or other emergency may be readily met. As has been said, the present spreader is intended more particularly for spreading asphalt which, as is well known, tends to cake but may be kept in proper pulverized condition by workmen standing upon the platforms 43 and equipped with hand rakes or similar implements which they may manipulate over the surface of the load and thereby maintain the same in the proper condition for ready discharge.

Should the asphalt show a tendency to stick and clog at the bottom of the hopper, the agitator shown in Figs. 7, 8 and 9 may be employed. In applying the agitator, a substantially U-shaped hanger 65 is provided at each end of the hopper and secured to the supports 41 and 42 thereat, the base of the hanger providing bearings for the ends of the agitator shaft 66 which is preferably hollow and has an outer tube 67 shrunk or otherwise rigidly secured thereon. Formed upon the outer tube is a spiral rib 68 having right and left hand pitches; each pitch extending from the center of the tube to one end thereof and being so disposed as to feed the material toward the ends of the hopper and also crowd it toward the back discharge opening, as will be understood on reference to Fig. 7. On each end of the shaft is secured a pinion 69 which meshes with a pinion 70 on a stub shaft 71 carried by a bearing bracket 72 on the adjacent end of the hopper. The bracket 72 is of arcuate formation having a slot 73 through which a securing bolt 74 is inserted into the hanger 65, this arrangement permitting the bracket to be adjusted concentrically with the agitator shaft and the pinion 69. On the outer end of the stub shaft 71 is secured a sprocket 75 and a chain 76 is trained about said sprocket and a sprocket 77 secured upon an extension of the axle 22, whereby the agitator shaft will be rotated from the axle. It will be readily noted that the adjustment of the bearing bracket 72 will keep the chain 76 taut while, in all positions, the pinions 69 and 70 will be in mesh. It will be understood that, when the agitator is employed, the fences and platforms may be omitted and the end

gates will be raised to clear the agitator.

It is to be particularly noted that the hopper is not a part of the vehicle which transports the road material but is detachably coupled thereto and its width should be at least equal to the extreme width of the path defined by the vehicle wheels, and preferably exceeds such width, so that the material will be spread beyond the path of the vehicle and adjoining courses may be joined without the use of any extraneous implements or requiring the vehicle to travel over a previously spread course. The spreading of the material may be performed continuously inasmuch as while one truck is delivering its load into and through the hopper another truck may be loaded and brought into position to be immediately coupled to the hopper when the load of the first truck has been completely discharged and said truck released from the hopper.

Having thus described the invention, I claim:

1. An apparatus for spreading road material comprising a hopper having its bottom portion and its rear wall constructed to admit free discharge of road material deposited therein, means on the front wall of the hopper for supporting the same for travel at the rear of a vehicle, and rigid draft bars pivoted to the front wall of the hopper and extending forwardly therefrom to engage with the frame of a vehicle for coupling the hopper thereto.

2. An apparatus for spreading road material comprising a hopper constructed to permit free flow of material through its bottom and rear portion, means on the front of the hopper for supporting the same for travel over a road surface, and draft bars pivoted to the front of the hopper and extending forwardly therefrom and having their front ends formed into hooks adapted to ride over and engage portions of the frame of a vehicle for coupling the hopper thereto.

3. An apparatus for spreading road material comprising a hopper constructed to permit free flow of material through its bottom and rear portion, means on the front wall of the hopper supporting the same for travel over a road surface, draft bars pivoted to the front wall of the hopper and projecting forwardly therefrom, the front ends of said draft bars being formed into hooks having beveled front ends whereby they may ride over and drop into engagement with a cross bar on a vehicle to couple the hopper to the vehicle, suspension rods mounted on the front wall of the hopper above the draft bars and supporting said bars, yieldable means co-operating with the suspension rods to hold the draft bars in their lowered operative position, and means operable from the front of a vehicle to release the draft bars therefrom.

4. An apparatus for spreading road material comprising a hopper having a downwardly and rearwardly inclined front wall and having its bottom and its rear wall constructed to permit free discharge of material deposited in the hopper, brackets secured upon the front wall of the hopper adjacent the ends thereof and vertically adjustable thereon, shoes carried by said brackets to run upon a road surface, bearings also secured upon the front wall of the hopper and adjustable vertically thereon, and rollers carried by said bearings at the inner sides of the shoes.

5. An apparatus for spreading road material comprising a hopper having a downwardly and rearwardly inclined front wall and having end walls, the lower portions of which converge downwardly and meet the front wall at the ends thereof, said end walls having discharge openings therethrough, and gates slidably mounted on the end walls to cover or uncover said openings.

6. Apparatus for spreading road material comprising a hopper having a downwardly and rearwardly inclined front wall and end walls meeting the front wall and provided with discharge openings through their rear portions, gates slidably mounted on the end walls to cover or uncover said openings, a fence, and means whereby the fence may be supported at the outer sides of the gates to regulate the spread.

7. Apparatus for spreading road material comprising a hopper having a downwardly and rearwardly inclined front wall and having end walls meeting the front wall, the end walls being provided with discharge openings through their lower portions, gates supported on the end walls and adjustable to cover or uncover said discharge openings, fences, and means for supporting the fences upon the ends of the hopper at the respective gates or spaced therefrom.

8. Apparatus for spreading road material comprising a hopper having a downwardly and rearwardly inclined front wall, end walls meeting the front wall and having discharge openings through their rear portions, means for controlling flow through said openings, and fences supportable at the outer sides of said openings and consisting of plates having their attaching edges in angular relation to their main portions.

9. Apparatus for spreading road material comprising a hopper having its bottom and rear portions constructed to permit free flow of material, platforms, and adjustable and detachable means for supporting the platforms on the ends of the hopper.

10. Apparatus for spreading road mate-

rial comprising a hopper constructed to permit free discharge of material through its bottom and its rear wall, cross bars on the ends of the hopper, platforms constructed at their inner ends to detachably engage the respective cross bars, and hangers attached to the ends of the hopper above the platforms and having their lower ends attached to the outer edges of the platforms.

11. Apparatus for spreading road material comprising a hopper having its rear wall constructed to permit free discharge of material deposited in the hopper, a back gate slidably mounted upon the rear wall of the hopper and held thereto, extensible hangers attached to the back gate adjacent the ends thereof, angle levers mounted upon the rear wall of the hopper and having outwardly extending arms pivoted to the upper ends of the hangers and having their inner arms extending downwardly, links pivoted to the lower ends of said arms and extending inwardly therefrom, and an operating lever fulcrumed upon the rear wall of the hopper and pivoted to the inner ends of said links.

12. Apparatus for spreading road material comprising an open-bottom hopper having a downwardly and rearwardly inclined front wall, means on said wall to support the hopper for travel at the rear of a dumping vehicle, means carried by said wall to couple the hopper to a vehicle, and an agitator mounted at the bottom of the hopper and extending from end to end thereof.

13. Apparatus for spreading road material comprising an open-bottom hopper having a downwardly and rearwardly inclined front wall, means on said wall to support the hopper for travel at the rear of a dumping vehicle, means carried by said wall to couple the hopper to a vehicle, and an agitator mounted at the bottom of the hopper and having a spiral rib extending from end to end of the hopper and having its pitch relatively reversed in its opposite end portions.

14. Apparatus for spreading road material comprising an open-bottom hopper having a downwardly and rearwardly inclined front wall, means on said wall to support the hopper for travel at the rear of a dumping vehicle, means carried by said wall to couple the hopper to a vehicle, an agitator mounted at the bottom of the hopper, and means on the ends of the hopper driven by said supporting means for actuating the agitator.

15. Apparatus for spreading road material comprising an open-bottom hopper having a downwardly and rearwardly inclined front wall, means carried by said wall to couple the hopper to a dumping vehicle, a rotatable agitator at the bottom of the hopper extending from end to end thereof, ground rollers on the front wall of the hopper, and gearing connecting the agitator with said rollers.

In testimony whereof I affix my signature.

CHARLES G. KIME. [L. S.]