April 19, 1932. V. F. BAUMGARDNER 1,854,575

WHEELED MACHINE

Filed May 4, 1931 4 Sheets-Sheet 1

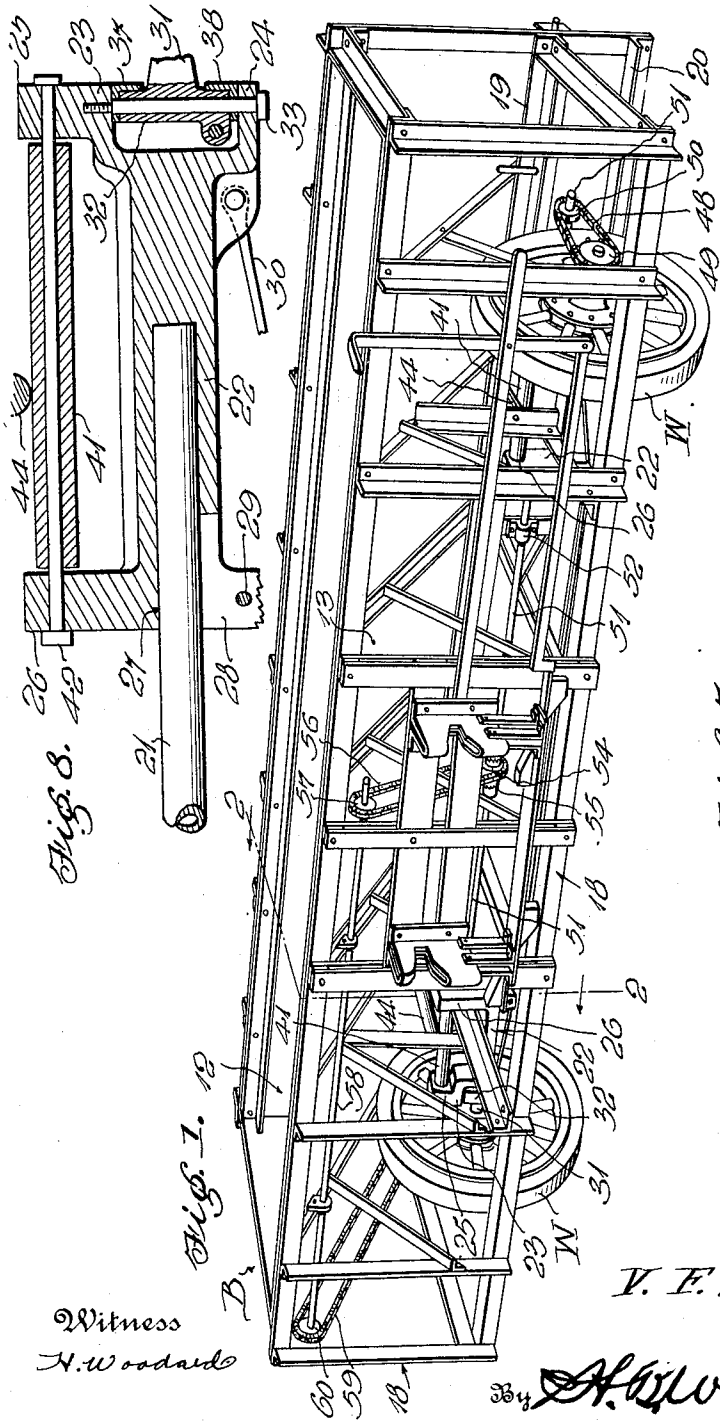

Fig. 8.

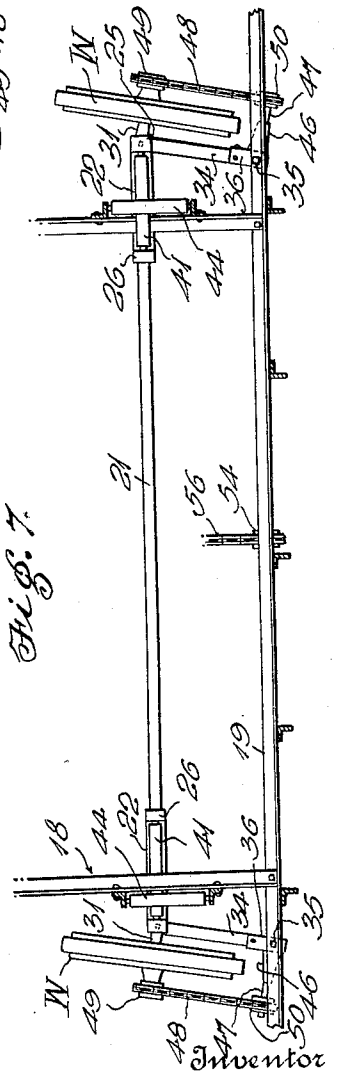

Fig. 7.

Witness
H. Woodard

Inventor
V. F. Baumgardner

By H. G. Wilson & Co
Attorneys.

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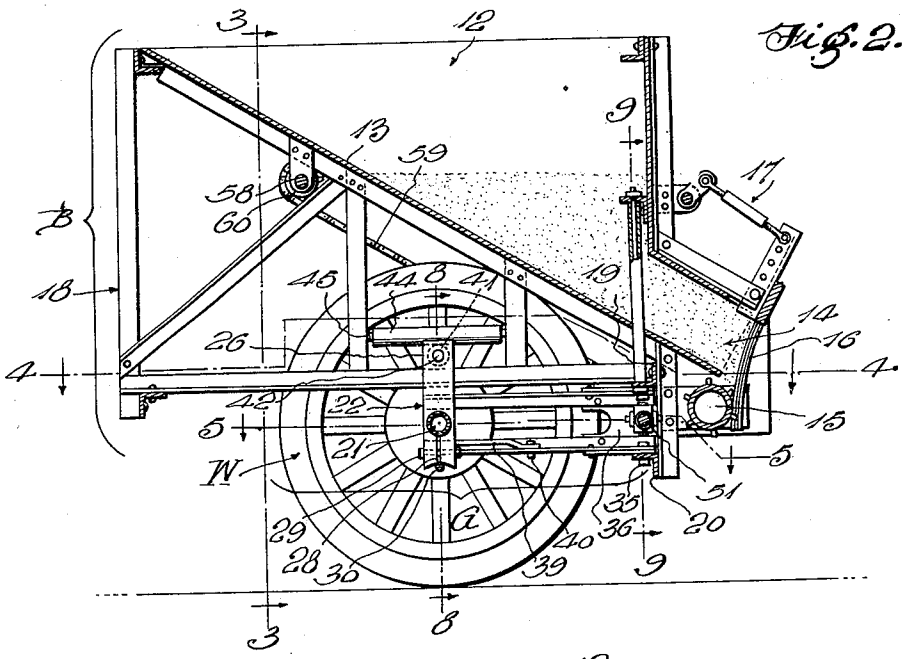
Fig. 2.



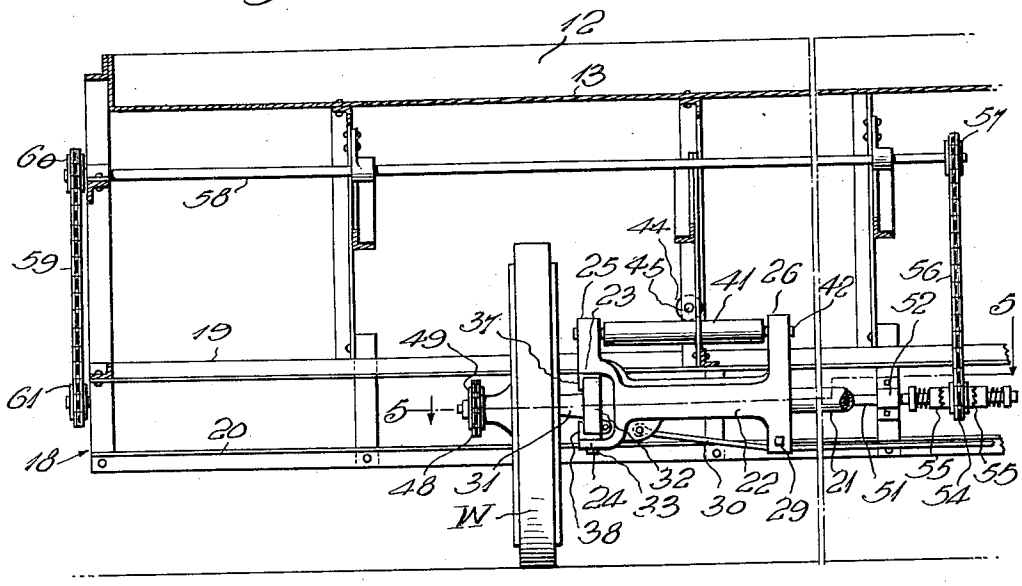


Fig. 3.

Inventor
V. F. Baumgardner

Witness
H. Woodard

By H. B. Williamson & Co
Attorneys.

April 19, 1932. V. F. BAUMGARDNER 1,854,575

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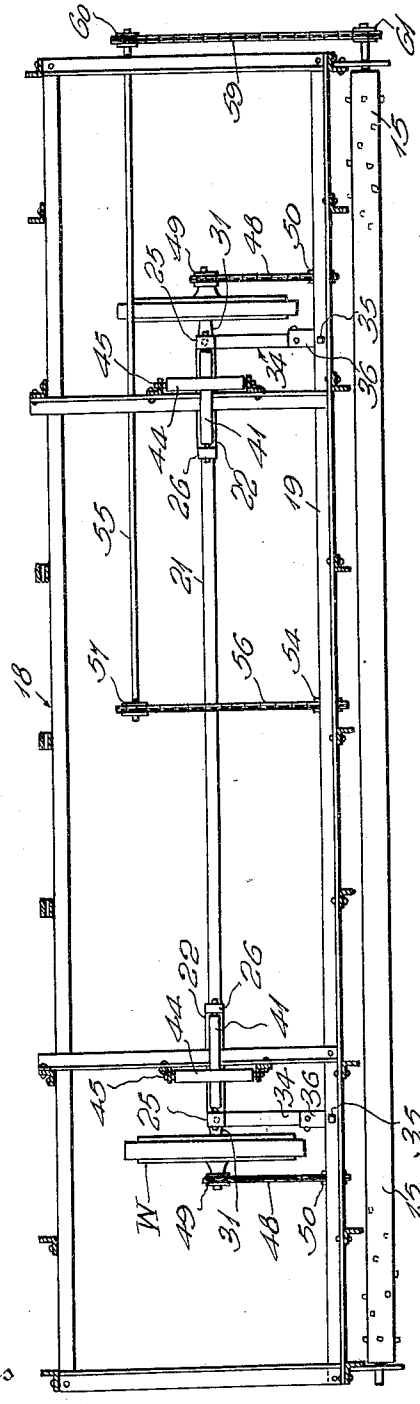

Fig. 4.

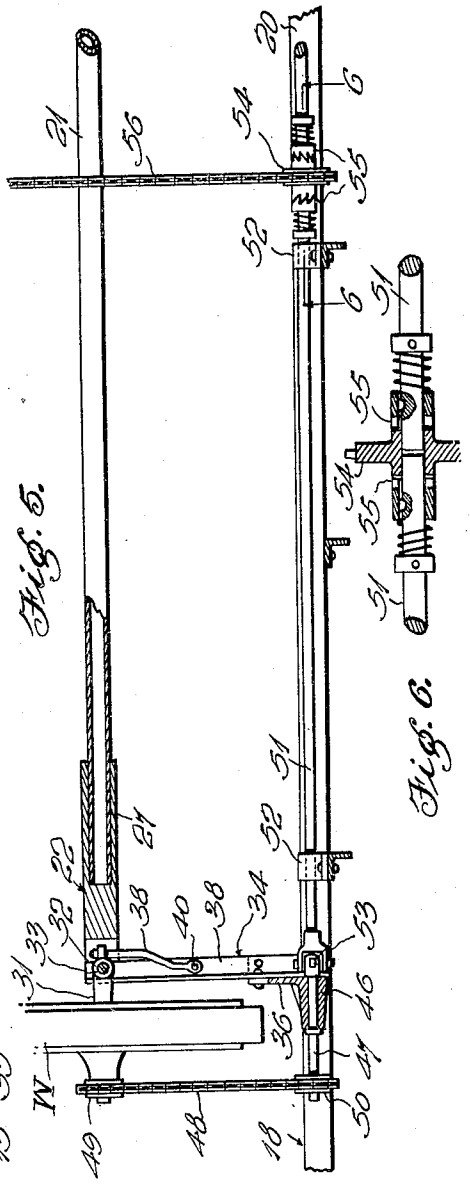

Fig. 5.

Fig. 6.

Witness
H. Wordaid

Inventor
V. F. Baumgardner

By H. R. Williamson
Attorneys.

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WHEELED MACHINE

Filed May 4, 1931 4 Sheets-Sheet 4

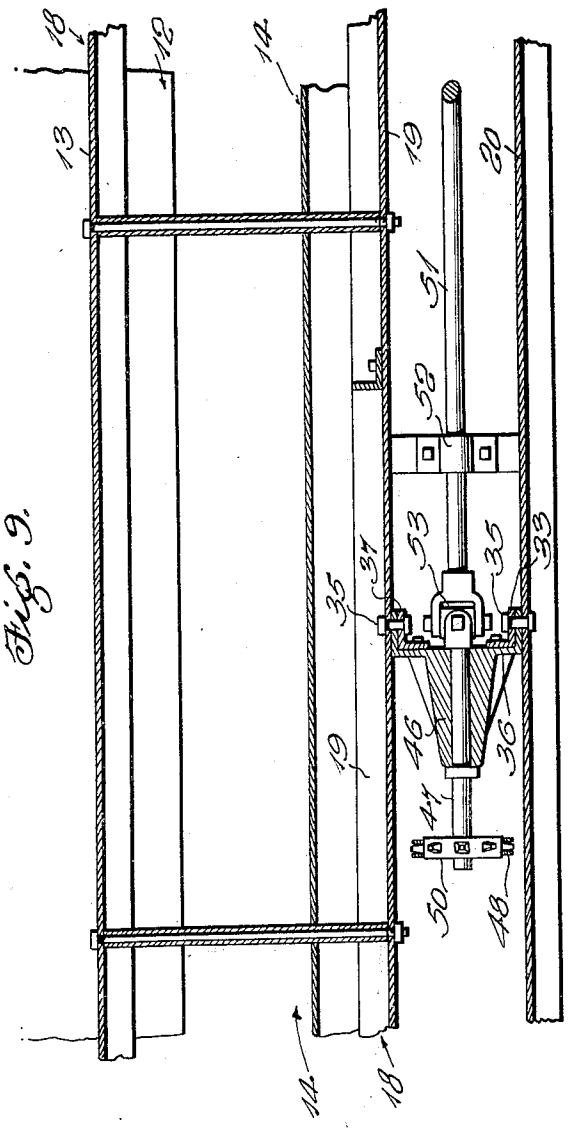

Fig. 9.

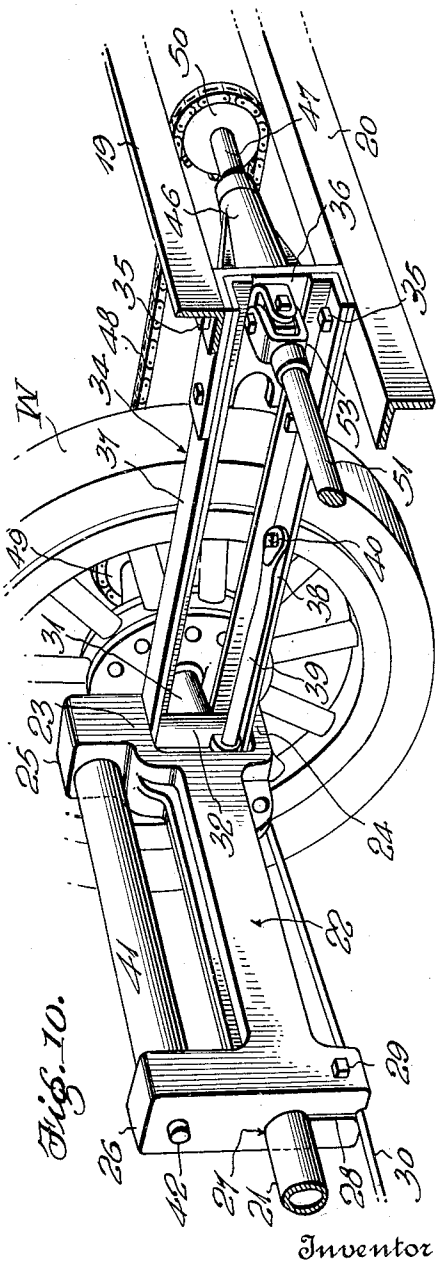

Fig. 10.

Inventor
V. F. Baumgardner

Witness
H Woodard

By H. B. Williamson & Co
Attorneys.

Patented Apr. 19, 1932 1,854,575

UNITED STATES PATENT OFFICE

VERSAL FORREST BAUMGARDNER, OF CELINA, OHIO

WHEELED MACHINE

Application filed May 4, 1931. Serial No. 534,968.

The invention relates to wheel-supported machines having laterally swingable running gears, and while the construction herein disclosed is intended primarily for machines used to spread crushed rock, gravel, cinders, etc., upon roadways, said construction is not restricted to this particular field.

Spreading machines of the type mentioned, are customarily supported by two wheels which cannot swing with respect to the frame of the machine, and said frame is rigidly coupled to the back of a motor truck from which the spreader hopper is supplied with the material to be spread. The spreader is either pulled or pushed by the truck and when driving the truck around curves, the wheels of the spreader must slide laterally upon the roadway, for they cannot swing to follow the curve. Not only is this injurious to tires and roadway, but it places a tremendous strain upon the spreader and the hitch by which it is connected with the truck, often resulting in hitch breakage and consequent expense and delay. To overcome such difficulties, has been the primary object of my invention.

In carrying the invention into effect, a novel running gear has been provided whose wheels may freely pivot to any required extent when traveling around curves, and a further object has been to provide for so supporting the weight of the spreader body structure and load upon the running gear as to prevent strain on the pivots about which the wheels swing and to interfere in no way with free pivoting of said wheels.

The spreader wheels drive the means which feeds the material from the hopper, and a still further object has been to provide unique construction whereby the pivoting of the wheels will not interfere with such driving of the feeding means, and the construction employed insures that the outside wheel which rotates faster than the inside wheel when traveling around curves, will always drive the feeding means. Hence, spreading of ample material along curves is attained, whereas machines which drive only from one wheel will under-deliver on curves if the driving wheel be at the inside of the curve.

With the foregoing and minor objects in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawings.

Fig. 1 is a perspective view looking from the rear toward the front of the machine.

Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary vertical sectional view on line 3—3 of Fig. 2.

Fig. 4 is more or less of a diagrammatic horizontal sectional view on line 4—4 of Fig. 2.

Fig. 5 is a fragmentary horizontal sectional view substantially on line 5—5 of Figs. 2 and 3.

Fig. 6 is a detail sectional view on line 6—6 of Fig. 5.

Fig. 7 is a fragmentary diagrammatic view similar to a portion of Fig. 4 and illustrating the manner in which the wheels may laterally swing.

Fig. 8 is an enlarged detail sectional view substantially on line 8—8 of Fig. 2.

Fig. 9 is a fragmentary vertical section substantially on line 9—9 of Fig. 2.

Fig. 10 is a fragmentary perspective view showing one of the wheels and adjacent features of construction.

A preferred structure, primarily for spreading machines, has been shown and will be rather specifically described, with the understanding however that within the scope of the invention as claimed, numerous variations may be made.

The machine comprises a body structure B (see Fig. 2), a laterally swingable running gear G pivoted to said body structure, and means whereby the running gear supports the weight of the body structure without unduly straining the pivots of said running gear and without interfering with pivotal movement of its wheels W.

In the construction illustrated, the body structure B embodies a body or hopper 12 having a forwardly declined bottom 13 and provided with a material outlet 14 at the lower edge of said bottom, material-discharge means being associated with said out-

let and consisting of a feed roller 15 and a metal brush 16 co-acting with said roller. The parts 17 (Fig. 2) are portions of adjusting and tensioning means for the brush 16, fully disclosed and claimed in my co-pending U. S. application Serial No. 534,969, filed May 4, 1931.

The body structure B also embodies a suitable frame 18 with whose details of construction, the present application is not concerned, said frame rigidly carrying the hopper 12. The greater part of the frame 18 is below the hopper bottom 13 and said frame embodies upper and lower horizontal bars 19 and 20 which are disposed under the outlet 14 of the hopper 12, said bars extending in the direction of the length of said hopper, that is, transversely of the line of travel of the machine. These bars 19 and 20 are specifically designated because of the fact that in the present showing it is to said bars that the running gear G is connected.

Behind and parallel with the bars 19 and 20, is an axle 21 which is preferably formed from a length of heavy tubing having brackets 22 secured upon its ends, each of said brackets having vertically spaced knuckles 23 and 24 and upstanding lugs 25 and 26. The ends of the tubing 21 are received in bores 27 formed in the brackets 22, these brackets are provided with splits 28 communicating with said bores, and bolts 29 are employed to contract the split portions of the brackets to tightly grip said tubing. This construction allows turning adjustment of either bracket 22 upon the tubing 21 should this be required. Preferably a truss rod 30 extends longitudinally under the tubing 21 and is suitably connected with the brackets 22.

Spindles 31 which are supported by the wheels W, are provided with knuckles 32 which are pivoted between the knuckles 23 and 24 of the brackets 22, by suitable king-bolts 33. Two parallel arms 34 extend longitudinally of the machine and have their rear ends secured in fixed angular relation with the spindles 31, the front ends of said arms being received between the frame bars 19 and 20 and connected with these bars by vertical pivots 35. Preferably each arm 34 embodies a front casting 36 and upper and lower angle metal bars 37 and 38 secured to said casting and extending rearwardly therefrom. The horizontal flanges of these bars may well lie against the knuckles 23 and 24 of the brackets 22, and the king-bolts 34 may pass through said flanges as detailed in Fig. 8. To hold the spindles 31 in fixed relation with the arms 34, the knuckles 32 may be provided with rigidly attached arms 39 secured by bolts or the like 40 to the lower angle metal bars 38, as seen for instance in Figs. 2 and 10.

The construction so far described allows the wheels W and the arms 34 to swing about the pivots 35 whenever the machine must travel around a curve (see Fig. 7) the body structure B then moving with respect to the axle 21, said axle serving to at all times hold the arms in parallel relation with each other.

Two lower horizontal weight-supporting rollers 41 extend between the lugs 25 and 26 of the brackets 22 respectively, and are mounted on the axle of the machine by means of said lugs and other appropriate provision such as the shafts 42. Two upper weight-supporting rollers 44 rest upon and cross the rollers 41, and by any desired means such as the shafts 45, said rollers 44 are mounted on the frame 18. The rollers 41 and 44 thus support the weight of the body structure B and its load upon the rear portion of the running gear G, in such manner as to place no strain upon the pivots 35 and to interfere in no way with free lateral swinging of the arms 34 and wheels W. As the running gear swings, the rollers anti-frictionally roll upon each other and hence do not interfere with the freedom of movement of running gear parts.

Provision has been made for driving the roller 15 with operating connections driven by the wheels W and the construction is such that the lateral swinging of the wheels will not interfere with driving of the roller. Moreover, this construction insures that when the machine is rounding a curve, the outside more rapidly rotating wheel will drive said roller so that an ample supply of material will be discharged onto the roadway. This is not the case however with machines which utilize one wheel only for driving the material discharge means, for if the drive wheel be at the inner side of the curve, the machine will under-deliver when traveling around said curve. Any claims to the provision just discussed which do not embody running gear features, are presented in the application above mentioned.

The castings 36 are provided with outwardly projecting horizontal bearings 46 in which short shafts 47 are mounted, these shafts being driven by sprocket chains 48 and sprockets 49—50, from the wheels W. Relatively long horizontal shafts 51 extend between and parallel with the frame bars 19 and 20, being mounted in appropriate bearings 52. The outer ends of these shafts are connected by universal joints 53 with the inner ends of the shafts 47, said joints being intersected by the pivotal axes about which the arms 34 swing. The inner ends of the shafts 51 are rotatable in the hub of a sprocket wheel 54 as seen in Fig. 6, and two spring-pressed one-way-clutch devices 55 are employed to operatively connect said shafts 51 with said sprocket 54. Normally, both shafts 51 and both one-way clutches 55 drive

the sprocket 54, but when one of the wheels W is rotating more rapidly than the other in rounding a curve, one of the shafts 51 is correspondingly driven more rapidly than the other of said shafts, the result being that the one-way clutch 55 on the more rapidly driven shaft 51 will then drive the sprocket 54. This sprocket is connected by a chain 56 and another sprocket 57 with a shaft 58, said shaft 58 being appropriately mounted under the hopper 12 and being connected by a chain 59 and sprockets 60—61, with the feed roller 15.

The driving means above described insures proper driving of the roller 15 whether the machine be proceeding along a straight stretch of road or be traveling around a curve, will not interfere with swinging of the wheels W with respect to the body structure B, and insures spreading of ample material upon curves.

Any preferred hitch may of course be employed for connecting the machine with a truck. A preferred hitch is more or less diagrammatically shown at the central portion of Fig. 1 but as its details form no part of the present invention, they have not been shown and will not be described.

It will be seen from the foregoing that novel and advantageous provision has been made for carrying out the objects of the invention. While preferred details have been shown, it is to be understood that the invention is not restricted to them, except to the extent dictated by the manner of claiming said invention.

I claim:

1. In a wheeled machine, a body structure, a laterally swingable running gear for said body structure, pivot means connecting the front of said running gear to said body structure, and means spaced behind said pivot means and supporting the weight of said body structure upon said running gear, said weight-supporting means embodying contacting relatively movable weight-supporting parts movable relatively as said running gear swings with respect to the body structure.

2. In a wheeled machine, a body structure, an axle, wheel-supported spindles pivoted to the ends of said axle, laterally swingable arms pivoted at their front ends to said body structure and having their rear ends secured in fixed relation with said spindles, and means supporting the weight of said body structure upon said axle, said means embodying contacting relatively movable weight-supporting parts carried by the axle and the body structure respectively, said parts being movable relatively as said body structure moves with respect to the axle incident to swinging of said arms.

3. In a wheeled machine, a body structure, a laterally swingable running gear pivoted to said body structure, a lower horizontal weight-supporting roller, means mounting said lower roller on said running gear, an upper horizontal weight-supporting roller crossing and resting on said lower roller, and means mounting said upper roller on said body structure, the two rollers being spaced above the ground and spaced longitudinally of the machine from the pivot means of said running gear and being adapted to roll upon each other during swinging of said running gear.

4. In a wheeled machine, a body structure, a running gear embodying a laterally swingable arm pivoted at one end to said body structure and provided at its other end with a ground wheel, a lower horizontal weight-supporting roller, means mounting said lower roller on said running gear for movement with said arm as the latter swings, an upper horizontal weight-supporting roller resting on and crossing said lower roller, and means mounting said upper roller on said body structure, the two rollers being spaced above the ground and adapted to roll upon each other as said arm swings with respect to said body structure.

5. In a wheeled machine, a body structure, an axle, wheel-supported spindles pivoted to the ends of said axle, arms extending longitudinally of the machine and secured in fixed relation with said spindles, said arms being pivoted to said body structure for lateral swinging, lower horizontal weight-supporting rollers, means mounting said lower rollers on said axle, upper horizontal weight-supporting rollers resting on and crossing said lower rollers, and means mounting said upper rollers on said body structure, said upper and lower rollers being adapted to roll upon each other when said body structure moves with respect to said axle during swinging of said arms.

6. In a wheeled machine, a body structure, an axle having brackets secured to its ends, said brackets embodying knuckles and upstanding lugs, wheel-supported spindles having knuckles pivoted to the knuckles of said brackets, arms extending longitudinally of the machine and pivoted to said body structure for lateral swinging, said arms being secured in fixed relation with said spindles, lower horizontal weight-supporting rollers mounted between said lugs, upper horizontal weight-supporting rollers resting on and crossing said lower rollers, and means mounting said upper rollers on said body structure, said upper and lower rollers being adapted to roll upon each other when said body structure moves with respect to said axle during swinging of said arms.

7. In a wheeled machine, a body elongated transversely of the line of movement of the machine, said body having a forwardly declined bottom, a frame structure under and

secured to said body, a running gear embodying two ground wheels under said body and spaced inwardly from the ends thereof, two horizontally swingable arms whose rear ends are supported by said wheels, and means pivoting the front ends of said arms to said frame; lower horizontal weight-supporting rollers, means mounting said lower rollers on said running gear above the ground, upper horizontal weight-supporting rollers crossing and resting on said lower rollers, and means mounting said upper rollers on said frame, said rollers being disposed under said body behind the pivots of said arms and being adapted to roll upon each other when said arms swing laterally.

8. In a wheeled machine, a body structure embodying a body elongated transversely of the line of movement of the machine, said body having a forwardly declined bottom, a running gear embodying laterally swingable arms under said forwardly declined bottom, and ground wheels under said bottom and supporting the rear ends of said arms, said arms and wheels being spaced inwardly from the ends of said body, means pivoting the front ends of said arms to said body structure, and means supporting the weight of said body structure on said running gear at points spaced behind the pivots of said arms.

9. In a wheeled machine, a body structure, a running gear for said body structure embodying two arms extending longitudinally of the machine and having supporting wheels at their rear ends, vertical pivots connecting the front ends of said arms with said body structure, horizontal transverse bearings carried by said front ends of said arms respectively, two short transverse shafts mounted in said bearings respectively, driving connections between said wheels and said short shafts respectively, additional transverse shafts mounted on said body structure, universal joints connecting said short transverse shafts with said additional shafts and intersected by the axes of said vertical pivots, and means for taking power from said additional transverse shafts, whereby said wheels may be utilized to drive parts carried by said body structure.

10. In a wheeled machine, a body structure, a running gear for said body structure embodying two arms extending longitudinally of the machine and having supporting wheels at their rear ends, vertical pivots connecting the front ends of said arms with said body structure, horizontal transverse bearings carried by said front ends of said arms respectively, two short transverse shafts mounted in said bearings respectively, driving connections between said wheels and said short shafts respectively, additional transverse shafts mounted on said body structure in alinement with each other and having their inner ends disposed adjacent each other, a power take-off wheel whose hub is loose upon said inner ends of said additional shafts, and one-way clutch driving connections between said additional shafts and said power take-off wheel.

In testimony whereof I affix my signature.

VERSAL FORREST BAUMGARDNER.