June 13, 1961 D. R. KERR 2,988,368

SAND SPREADING MECHANISM WITH REVERSIBLE CONVEYER

Filed Nov. 28, 1958 5 Sheets-Sheet 1

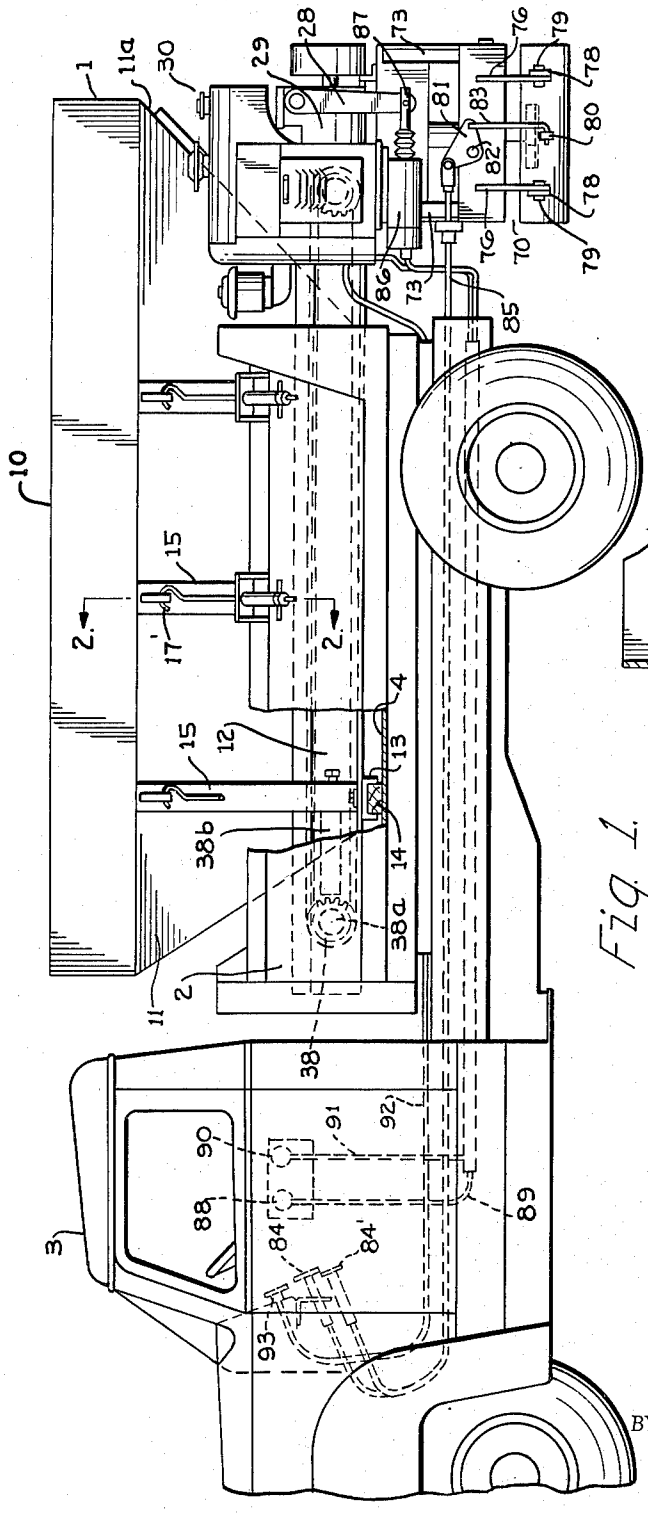


Fig. 1

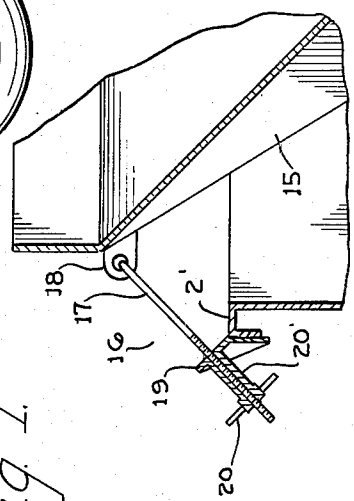


Fig. 2

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SAND SPREADING MECHANISM WITH REVERSIBLE CONVEYER

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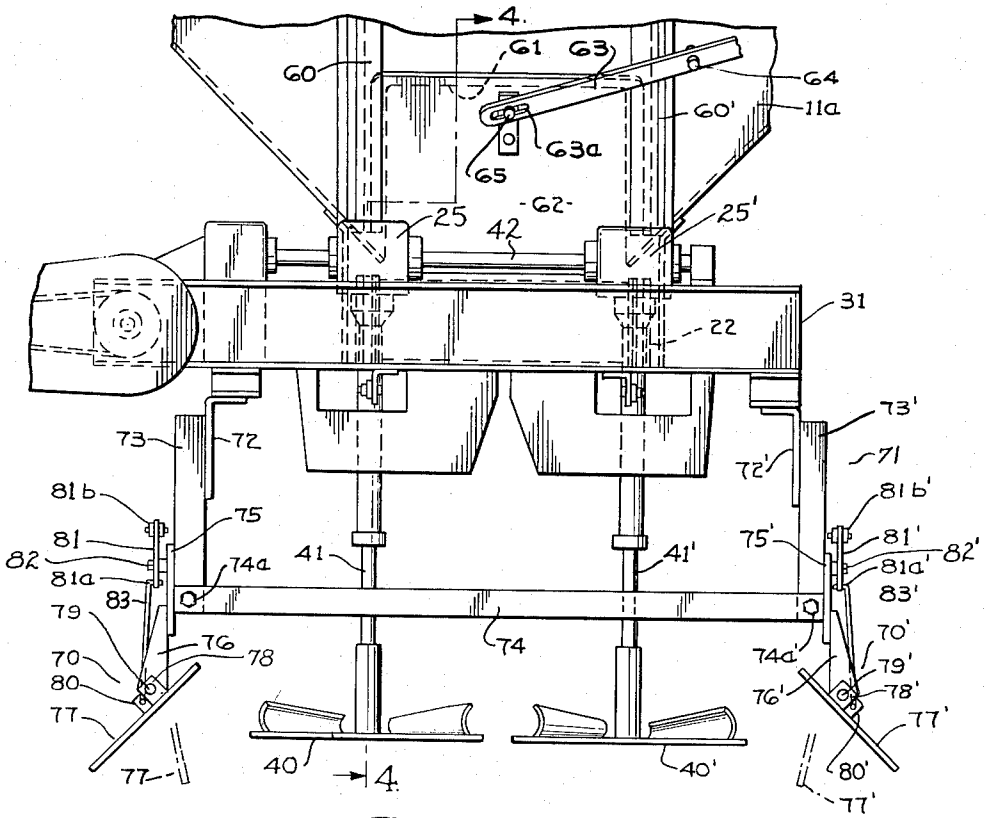


Fig. 3.

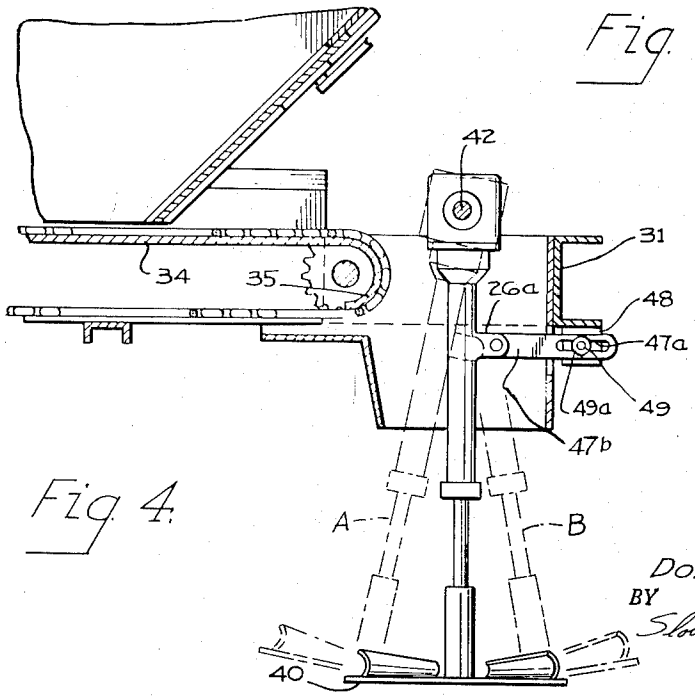


Fig. 4.

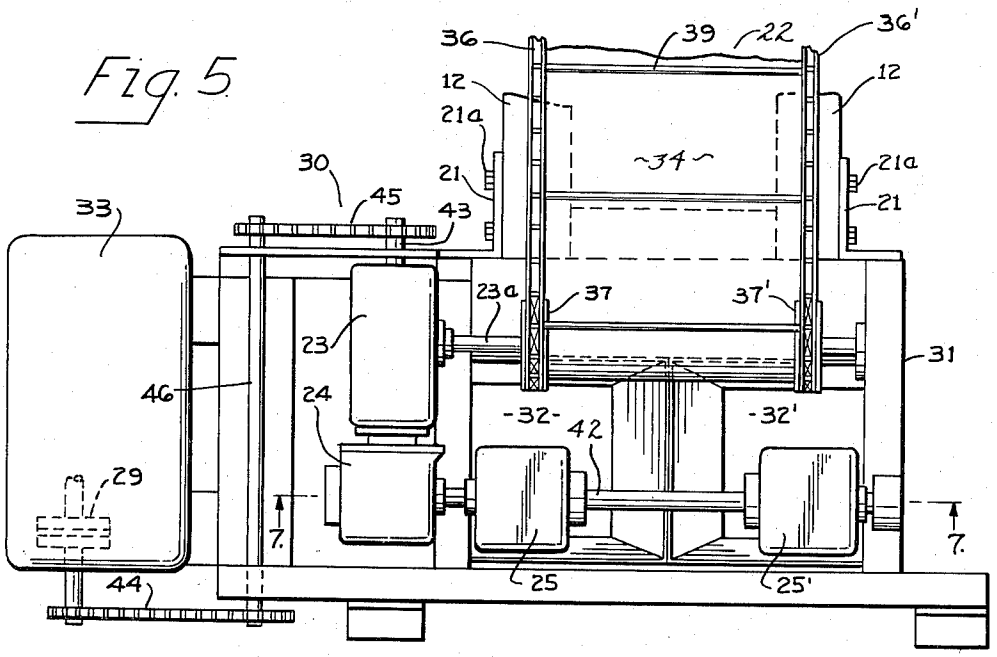
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SAND SPREADING MECHANISM WITH REVERSIBLE CONVEYER

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Fig. 5



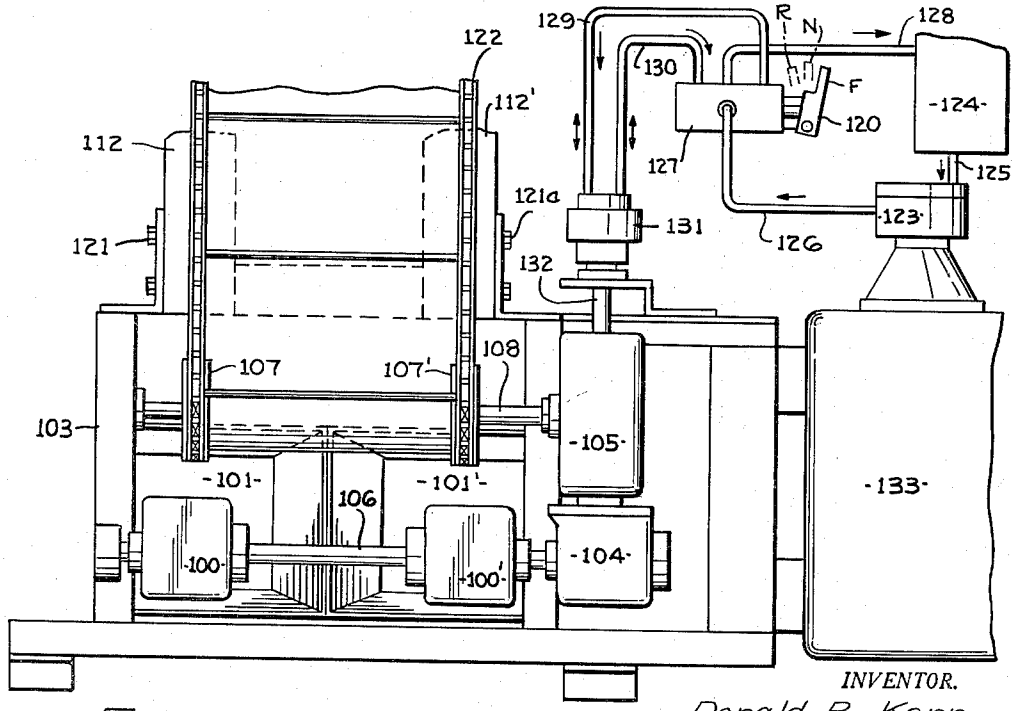


Fig. 6.

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SAND SPREADING MECHANISM WITH REVERSIBLE CONVEYER

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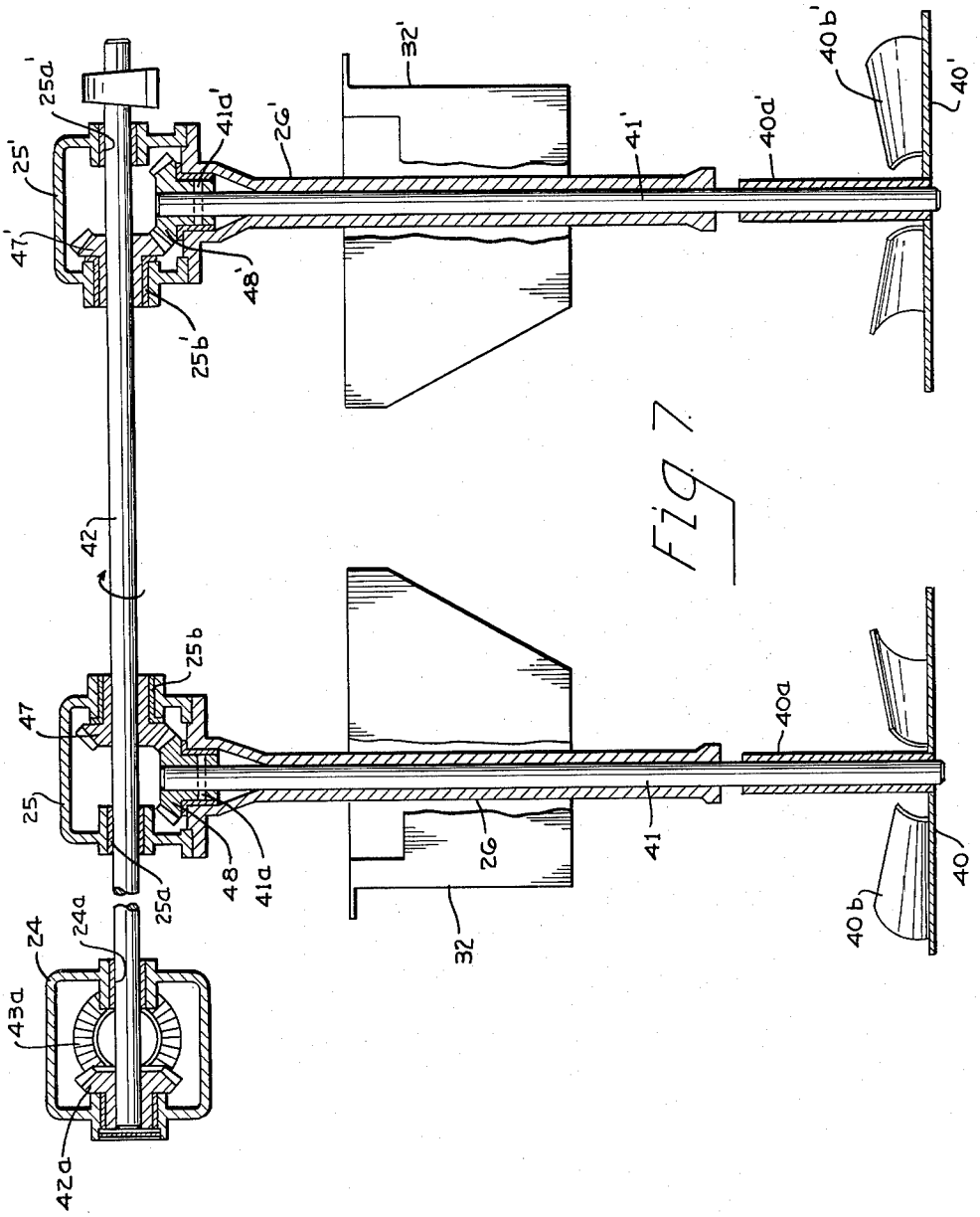


Fig. 7.

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SAND SPREADING MECHANISM WITH REVERSIBLE CONVEYER

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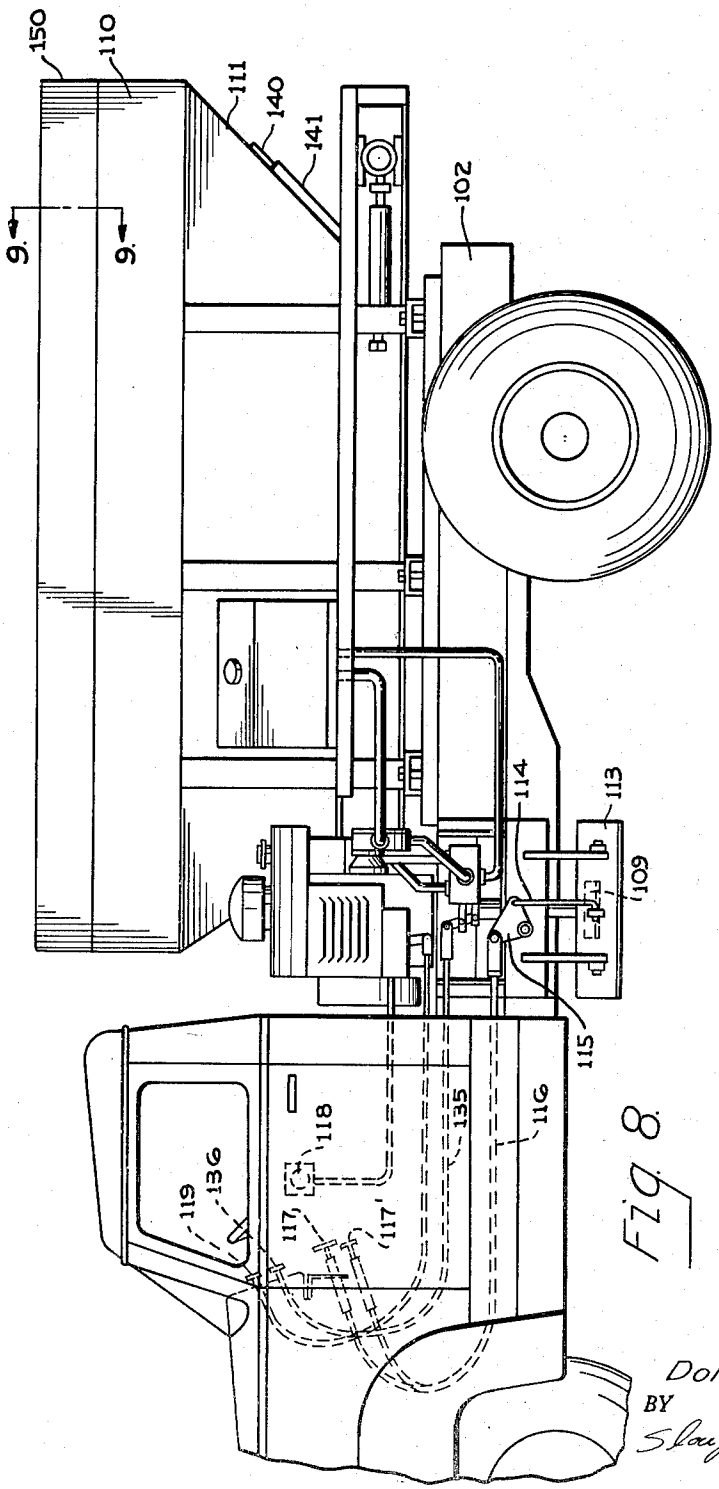


Fig. 8

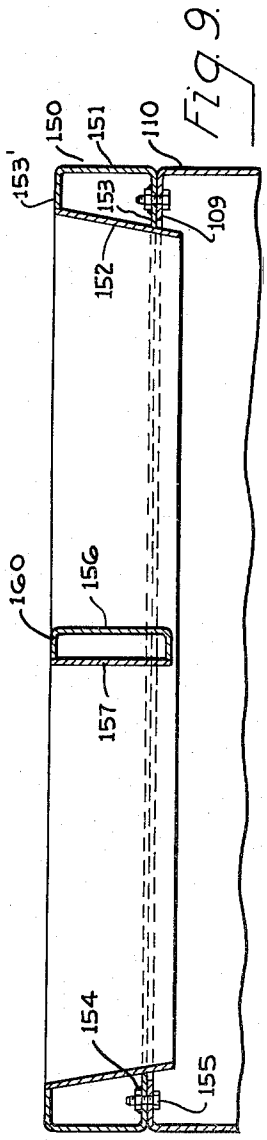


Fig. 9

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2,988,368

SAND SPREADING MECHANISM WITH REVERSIBLE CONVEYER

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Filed Nov. 28, 1958, Ser. No. 777,111
8 Claims. (Cl. 275—8)

My invention relates to sand spreaders and relates more particularly to sand spreading mechanisms adapted to be employed with standard trucks or other vehicles for distributing sand on roads, the volume and distribution of the sand being variable to suit different road conditions.

My invention involves improvements over structures illustrated, described and claimed in U.S. Letters Patent 2,705,149 issued March 29, 1955, and in application for U.S. Letters Patent filed August 27, 1956, Serial No. 606,361, now abandoned.

The improvements involved in the present invention include cab operated means for operating the sand spreader from within the vehicle to achieve complete control of the various operative movements of the sand spreader mechanism during driving; improved means for controlling the spread of the material; a readily detachable motor operated unit for driving the spreader mechanism and adapted to be optionally mounted centrally or rearwardly of the vehicle; hydraulic means adapted for assembly with the spreader motor mechanism to drive the conveyor in either direction; and means for optionally enlarging the capacity of the standard truck for utilization of the mechanism in trucks of different size, type, and height.

It is an object of my invention to provide in a sand spreading mechanism of the type referred to, improved control means.

It is a further object of my invention to provide in a sand spreading mechanism of the type referred to, improved spreading and greater flexibility.

A still further object of my invention is to provide sand spreading mechanism which can be mounted either centrally or at the rear of a truck and which is under the control of the driver of the truck during operation of the truck.

Other objects of my invention and the invention itself will become more apparent by reference to the drawings illustrating the invention and the description which follows.

In the drawings:

FIG. 1 is a side elevation of a conventional dump truck with the sand spreading device of my invention mounted thereupon;

FIG. 2 is a vertical section taken along the line 2—2 of FIG. 1;

FIG. 3 is a rear elevation of the device of FIG. 1;

FIG. 4 is a section taken along the line 4—4 of FIG. 3;

FIG. 5 is a plan view of the device of FIG. 3;

FIG. 6 is a plan view of a modified form of the mechanism of FIG. 5;

FIG. 7 is a section taken along the line 7—7 of FIG. 5;

FIG. 8 is a side elevation of a truck-type vehicle showing the embodiment of FIG. 6 mounted thereupon; and

FIG. 9 is a vertical section taken along the line 9—9 of FIG. 8.

This invention comprises in general a large hopper adapted to be loaded with sand or the like abrasive material for mounting upon a truck. The hopper is open at the bottom thereof and provided with conveyor means for moving the sand either forwardly or rearwardly to a pair of chutes which direct the sand downwardly toward the surface of the road. A pair of spinners is provided which project downwardly through the chutes to deflect and scatter the falling sand in a desired pattern. Suitable power mechanism is provided adjacent the spinners, and control means for operating the entire sand spreading unit are mounted within the cab of the truck.

The present device is adapted to be mounted either within the bed of a conventional dump-type truck or directly to the frame of the truck. When mounted to a dump truck, the mechanism is adapted for sand spreading from the rear of the vehicle. When mounted directly to the truck frame, said sand spreading mechanism may optionally be mounted either at the rear of the vehicle or immediately behind the cab forwardly of the hopper. FIG. 1 shows the device of the present invention mounted to a dump truck with the sand spreading device positioned rearwardly; FIG. 8 shows the hopper mounted directly to a truck frame with the sand spreading mechanism positioned intermediate the ends of said truck, forwardly of the hopper.

The present application includes two embodiments of the sand spreading mechanism, the details of which will be herein later thoroughly described. I also anticipate that the power source for actuating the sand spreading mechanism may optionally be either an independent motor mounted adjacent the spinner or a power take-off from the prime mover of the truck itself.

Referring now to the drawings in all of which like parts are designated by like reference characters and particularly to FIG. 1, the sand spreading device of my invention is generally indicated at **1** and is mounted within the bed **2** of a conventional dump truck **3**. The sand spreading device **1** comprises a hopper **10** having downwardly converging walls **11**. Said hopper is unitarily mounted upon parallel, longitudinal frame members **12** at the bottom thereof having channel shaped, transverse members **13** rigidly secured thereto. A wooden member **14** of generally rectangular cross section is preferably interfitted with the channel shaped transverse member **13** whereby said transverse member is spaced upwardly a slight distance from the bottom surface **4** of the truck bed **2**. Vertical brace members **15** welded or otherwise suitably secured to the converging side walls **11** provide rigidity and support to said walls.

The hopper **10** is maintained on the dump bed **2** by means of hold down clamp assembly **16** as detailed and best shown in FIG. 2. The hold down clamp assembly **16** comprises an adjustment rod **17** having a hook **17'** on one end thereof adapted to engage an apertured ear member **18** welded adjacent the uppermost end of one of the brace members **15**. The opposite end of the rod **17** projects through an apertured brace **19** welded or otherwise suitably secured to the dump bed flange as indicated at **2'**. A T-shaped handle **20** having an internally threaded shank **20'** is thread fitted upon the outwardly projecting end of the rod **17** and is adapted to be tightened against the apertured brace **19** to maintain the hopper **10** in position.

By referring to FIG. 5 it will be noted that the sand spreader itself, generally indicated at **30**, comprises a rectangular, centrally open frame **31** detachably mounted to the rearmost end of the longitudinal frame member **12** by means of a pair of support brackets **21** and bolts **21*a***. The spreader frame **31** is provided with a pair of downwardly directed chutes **32** and **32'** adjacent the rearward end of the frame member **12**, said frame **31** projecting laterally from said chutes to provide support for small motor **33**. The motor **33** may be of any suitable type, such as a small gasoline engine, and is adapted, through clutch **29** and chain and sprocket drives indicated generally at **44** and **45**, to drive a sand conveyer **22** through a reduction gear box **23** and a pair of sand spreading spinners **40** and **40'** by means of a transfer gear box **24** and a pair of spinner gear boxes **25** and **25'**. Referring now to FIGS. 3, 4, and 5, it will be noted that the conveyer **22** is posi-

tioned immediately below the open bottom hopper **10**, extending longitudinally thereof whereby the sand from said hopper can be carried in the direction of the sand spreader and the chutes **32** and **32'** thereof. Said conveyer comprises a stationary platform **34** which is downwardly curved as shown at **35** adjacent the chutes **32—32'**. The movable portion of the conveyer **22** comprises a pair of laterally interspaced chains **36** and **36'** mounted to be rotated by means of a shaft **23***a* from the reduction gear box **23** and a pair of sprockets **37** and **37'** mounted upon said shaft. As shown in FIG. 1, the opposite ends of the chain **36** and **36'** pass over idler sprockets **38**. The idler sprockets **38** are mounted in longitudinally slidably movable bearings **38***a* which are adjustable toward or away from the sprockets **37—37'** by means of an adjusting device as indicated at **38***b*. Transverse bars or scrapers **39** are mounted between the chains **36—36'** to move along the surface of the platform **34** to convey the sand to the chutes **32—32'**. The reduction gear box **23** drives the shaft **23***a* at a reduced speed whereby the conveyer **22** moves the sand into the chutes **32—32'** at the desired speed and in the desired amount.

Referring now particularly to FIGS. 3, 4, 5, and 7, it will be noted that the spinners **40** and **40'** are positioned below the chutes **32** and **32'** respectively by means of a pair of spinner shafts **41** and **41'** suspended from and rotated by the spinner gear boxes **25** and **25'**. The spinner gear boxes, spinner shafts, and spinners are substantially mirror images of each other in construction whereby they rotate in opposite directions, and it will be understood that the part numerals which apply to those parts associated with the spinner gear box **25** also designate similar parts associated with the spinner gear box **25'**, with the exception that each numeral is primed in the latter instance.

The spinners **40** and **40'** are driven through the spinner gear boxes **25** and **25'** by means of a common drive shaft **42** projecting laterally from the transfer gear box **24**. One end of the drive shaft **42** is journaled for rotation within the transfer gear box **24** as indicated at **24***a* and has mounted thereupon a beveled gear **42***a* which meshes with a similar beveled gear **43***a* mounted to a shaft **43**. As well shown in FIG. 5, the shaft **43** is driven off the motor **33** by means of the sprocket assemblies **44** and **45** and the interconnecting shaft **46** between said sprocket assemblies.

The spinner gear box **25** houses intermeshing beveled gears **47** and **48**. The beveled gear **47** is mounted to rotate with the drive shaft **42**, and the beveled gear **48** is secured to the spinner shaft **41** by means of a cotter pin **41***a*. The spinner gear box **25** is provided with a downwardly extending, tubular sleeve portion **26** through which the spinner shaft **41** projects and in which said spinner shaft is rotatably mounted. The sleeve portion **26** of the spinner gear box **25** provides rigidity and stability to the rotating spinner shaft **41** and the associated spinner **40**.

The spinner **40** comprises a circular disk having an upwardly projecting, tubular hub portion **40***a* mounted upon the lowermost end of the spinner shaft **41**. The upper surface of the spinner **40** is provided with a plurality of curved, upwardly projecting, radiating blades **40***b* which are adapted upon rotation of said spinner, to effectively deflect and scatter sand which is falling from the chute **32**. From the above description, it will be understood that the spinners **40** and **40'** are caused to rotate in opposite directions by means of the drive shaft **42**, the spinner gear boxes and associated gears, and the drive shafts **41** and **41'**. The sand which is delivered to the chutes **32—32'** by means of the conveyer **22** drops downwardly upon the rotating spinners and is deflected by the deflector blades **40***b* and **40***b'* to scatter the sand in a desired pattern.

Referring now to FIG. 4, it will be noted that the entire spinner assemblies are individually tiltable about the axis of the drive shaft **42**. This is possible due to the fact that said drive shaft is rotatably mounted in the housings **25—25'** as indicated at **25***a—25a'* and that the gears **47—47'** are also rotatably mounted within said spinner gear boxes as indicated at **25***b—25b'*.

As best seen in FIG. 4, adjustment means for the spinner **40** comprise a strap **47***b* pivoted at one end thereof to an integrally formed journal **26***a* of the sleeve portion **26** and being bolted at the other end thereof to a downwardly projecting bracket **48** welded or otherwise suitably secured to the frame **31**. A bolt **49** projects through the bracket **48** and into a longitudinal slot **47***a* in the free end of the strap **47**. By means of a tightening nut **49***a* threaded upon the outwardly projecting end of the bolt **49**, the strap may be firmly secured in a plurality of longitudinal positions relative to the bracket **48**. The spinner **40** can, therefore, be tilted away from the vertical in either a forward or rearward direction as indicated by broken lines in FIG. 4. The broken lines showing A wherein the spinner **40** is pivoted forwardly indicates the position in which the spinner will deflect and scatter the sand in a rearward direction. The sand will thus hit the radially outermost end of the deflector blades **40***b* whereby it is spread thicker immediately behind the truck and is spread over a narrower area than when the plane of the spinner is positioned parallel with the ground, the spinner shaft **41** being in a vertical position. Tilting of the spinner **40** to the dotted position B in FIG. 4 will cause the pattern of spread and concentration to be in the opposite direction whereas the full line position indicates the point at which said spinner will scatter sand evenly and equally in all directions.

The volume of sand delivered to the impellers is controlled by means of an adjustable gate as illustrated in FIG. 3. The converging end wall of the hopper **10** which is adjacent the sand spreading mechanism and designated **11***a* is provided with a pair of angular guides **60** and **60'**. The guides **60—60'** are positioned in parallel relationship on either side of a rectangular opening **61** in the end wall **11***a*. The opening **61** is directly above the conveyer **22** whereby sand may be delivered to said conveyer. A gate **62** is adapted to slidably interfit the guides **60—60'** whereby said gate may be raised or lowered to open or close the opening **61**. A lever **63** is pivoted to the end wall **11***a* by means of a stud **64** to one side of the opening **61**, one end of said lever being slotted at **63***a* and telescoped over a stud **65** mounted in the gate **62**. By pivoting the lever **63** at the outermost end thereof the gate **62** may be raised or lowered. Means for holding the lever in any adjusted position may be provided in any suitable manner.

It is apparent that the position of the gate as well as the speed of the conveyer will determine the volume of sand which is delivered to the impeller by the conveyer. By controlling this volume the thickness of the deposit of the sand may be varied which allows the operator to drive the truck at different speeds depending upon road conditions. For example, in a congested area, it may be necessary to drive the truck very slowly in which case the volume of sand delivered to the impellers would be low. In rural areas where the truck may be driven more rapidly, the rate of flow of sand may be more rapid to produce satisfactory coverage.

To aid in controlling the spread of sand from the spinners **40—40'**, I provide a pair of adjustable deflector units generally indicated at **70** and **70'** in FIG. 3. The deflector units are mounted at either side to a box-like frame **71** suspended beneath the frame **31** by means of a pair of support brackets **72** and **72'** of angular shape, said brackets being welded or otherwise suitably secured beneath the frame **31** and to laterally disposed, vertically upright members **73** and **73'** of the deflector unit frame **71**. The lowermost ends of the upright members **73—73'** are rigidly connected by means of a cross beam **74** bolted at either end thereof to said uprights **73—73'** by means of

bolts and nut assemblies as indicated at **74***a* and **74***a'* respectively.

Referring now to FIGS. 1 and 3, the deflector units **70—70'** comprise mounting plates **75—75'** of rectangular form longitudinally welded or otherwise suitably secured to the frame **71** adjacent the lowermost edge thereof. The mounting plate **75** is provided with a pair of longitudinally interspaced support arms **76** welded or otherwise suitably secured thereto and projecting vertically downwardly therefrom. The mounting plate **75'** is similarly provided with a pair of support arms **76'**. The lowermost ends of the support arms **76—76'** provide pivotal mounting means for a pair of deflector plates **77—77'** associated respectively with the arms **76—76'**. The deflector plates **77—77'** are provided with longitudinally interspaced, perpendicular lugs **78—78'**. Studs **79—79'** project through suitable apertures in the support arms **76—76'** and the lugs **78—78'** to provide pivotal mounting for the deflector plates **77—77'**.

As best seen in FIG. 1, a lift lug **80** is secured to the deflector plate **77** intermediate the lugs **78**. The deflector plate **77'** is similarly provided with a lift lug **80'**. Bell crank levers **81—81'** are pivoted upon the mounting plates **75—75'** by means of pivot studs **82—82'**. Lift links **83—83'** interconnect the downwardly directed ends **81***a*—**81***a'* of said bell crank levers to the lift lugs **80—80'**. By pivoting said bell cranks about the pivot studs **82—82'**, the deflector plates **77—77'** are pivotable from the full line showing of FIG. 3 to the dotted line showing thereof.

Said bell crank levers are pivotally actuated from the cab of the truck by means of a pair of handles **84—84'** interconnected with the uppermost ends of the bell crank levers as indicated at **81***b*—**81***b'* by means of a Bowden type cable **85**. By manual movement of the control handles **84—84'** in different directions, the operator is able to change the angles of the deflector plates **77—77'** whereby the spread of sand is effectively controlled. This is particularly advantageous when spreading sand close to parked automobiles or the like where it may be necessary to prevent the sand from spreading laterally in one direction from the truck but wherein it is desired to allow the sand to spread in the opposite direction. To do this the operator can adjust one of the deflector plates to a vertical or slightly inwardly angled position while adjusting the other deflector plate to a horizontal position.

Referring now to FIG. 1, the clutch **29** which engages the motor **33** to drive the conveyer **22** and the spinners **40** and **40'** is actuated by means of a vacuum controller **86** mounted beneath said motor. The vacuum controller **86** is provided with an outwardly projecting, reciprocable rod **87** pivotally connected to a lever **28**, projecting downwardly from the clutch **29**. Said vacuum controller is powered by the motor **33** and is controllable from the cab of the truck as indicated at **88** by means of an interconnecting electrical line **89**. An electric switch located in the cab at **88** energizes a solenoid (not shown) in the vacuum controller **86** which directs the vacuum in a well-known manner to cause the rod **87** to move either longitudinally outwardly or inwardly. This movement pivots the clutch lever **28** thus engaging or disengaging the clutch **29**, as desired by the operator.

A starter button **90** for starting the motor **33** is also mounted within the cab of the truck, said starter button being connected to said motor through an electrical line **91**. A Bowden type control cable **92** interconnects the motor **33** with a throttle **93** mounted within the cab of the truck whereby speed of said motor is controllable by the operator.

Thus it will be seen that the operator of my improved sand spreading device can operate the sand spreading mechanism entirely from the cab of the truck. He has readily available to him a starter button for starting the motor **33** and the throttle **93** for regulating speed of said motor after it has been started; he can engage or disengage the spinners **40—40'** and the conveyer **22** at will by means of the switch **88** which controls the vacuum controller **86**; and he can control the lateral spread of the sand by actuating either or both of the deflectors **77—77'** by means of the control handles **84—84'** respectively.

Referring now to the embodiment of my invention as shown in FIGS 6, 8, and 9, it will be understood that the conveyer, spinners, and deflectors, operate directly through mechanism which is substantially similar to that found in the first embodiment of my invention, the details of which need not be repeated here. Briefly, the spinners are operated through spinner gear boxes **100** and **100'** whereby said spinners project downwardly through chutes **101** and **101'** mounted adjacent the forward end of a hopper **110**, said hopper being of substantially similar construction to the hopper **10** of the first embodiment of my invention but being mounted directly upon a truck frame **102** instead of being mounted within the bed of a dump truck. The chutes **101—101'** are mounted forward of the hopper by means of a frame **103** which is in turn detachably mounted to longitudinal frame members **112—112'** of the hopper **110** by means of angled support brackets **121** and bolts **121***a*. A transfer gear box **104** is also mounted upon the frame **103** along with a reduction gear box **105**. The transfer gear box **104**, as in the first embodiment of my invention, is adapted to drive the spinners through the spinner gear boxes **100—100'** by means of a shaft **106**. The reduction gear box **105** is adapted to drive a conveyer **122** by means of sprockets **107** and **107'** mounted upon a shaft **108** projecting laterally from said reduction gear box. As in the first embodiment of my invention, sand is delivered from the hopper by means of the conveyer **122** to the chutes **101—101'** whereby said sand drops downwardly upon the spinner indicated at **109** in FIG. 8 to be distributed beneath the truck.

The deflectors indicated at **113** are operated through lift links **114**, bell crank levers **115**, Bowden type cables **116**, and control handles **117** and **117'** in a manner substantially similar to the first embodiment of my invention. The engine in the present embodiment of my invention is mounted to the frame **103** and is controlled by a starter button **118** and a throttle **119** which are mounted within the cab of the truck, also in a manner similar to that found in the first embodiment of my invention. It will also be understood that the spinners **109** are forwardly and rearwardly adjustable as are the spinners **40—40'** by the same type of mechanism, such mechanism not being shown in the second embodiment.

As shown in FIG. 6, the means for transferring power from the engine **133** to the reduction gear box **105** and the transfer gear box **104** are hydraulic means. The engine **133** is adapted to drive a hydraulic pump **123** which is mounted directly to said engine. The hydraulic pump **123** is supplied with fluid from an oil tank **124** by means of an hydraulic line **125**. A second hydraulic line **126** is connected to a standard, two-way parallel valve **127**, which is in turn connected back to the oil tank **124** by means of a return line **128**. A pair of hydraulic lines **129** and **130** connect the valve **127** to a hydraulic motor **131**. Said hydraulic motor is provided with a drive shaft **132** which drives the transfer gear box **104** and the reduction gear box **105**. The valve **127** is provided with an actuating handle **120** whereby fluid is directed through the hydraulic motor **131** and through the tank **124**. The handle **120** has three adjusted positions as indicated by the full line showing and the two dotted line showings of FIG. 6. The full line position designated by the letter "F" directs fluid through the line **129** to the hydraulic motor **131** and exhausts said fluid back through the valve by means of line **130** and to the tank by means of line **128**. The dotted line position designated "N" directs the fluid from the pump **123** through the line **126**, through the valve

127, and back to the tank 124 by means of the line 128. In this position the hydraulic motor is not actuated and is in a "neutral" or nonoperating position. To reverse the hydraulic motor, the handle 120 is placed in the dotted line position "R" whereby fluid is directed through the line 130 to drive the hydraulic motor 131 in the reverse direction after which the fluid is exhausted through the line 129, the valve 127 and the line 128 back to the tank 124.

In the forward "F" position of the handle 120, the conveyer 122 runs in a forward direction relative to the truck whereby sand is conveyed from the hopper 110 to the chutes 101—101'. Sand is thereby delivered to the spinners 109, and the sand spreading operation as herein before fully described takes place.

By reversing the direction of the conveyer 122, sand is carried to the rear of the truck and, therefore, to the rear of the hopper 110.

As best shown in FIG. 8, the modified hopper is provided with an additional slidable door or gate 140 mounted by means of angled slideways 141 to the rearwardly directed downwardly converging wall surface 111 of the hopper 110. It will be understood, of course, that the usual metering gate as shown in the first embodiment of my invention (not shown in the second embodiment) is provided at the forward end of the hopper adjacent the chutes 101, 101'.

The slidable gate 140 at the rear of the hopper makes it possible to use the sand spreading device of my invention not only for scattering sand on the roadway but also for stock piling the sand at intervals along the highway. It is well known that it is impossible for a single truck to carry enough sand for scattering beyond a limited distance. In icy weather, therefore, it is advantageous to have piles of sand stored at reasonable intervals along the highway whereby a sand spreading truck may be reloaded without driving many miles to a source of supply. The reversing features of this second modification makes the truck adaptable for such stock piling operations.

The valve 127 is operable through a reciprocating, Bowden type control cable 135 connected to a push pull type handle 136 mounted at any convenient point within the cab of the truck. This enables the operator of the vehicle to start or stop the engine, operate the deflectors, or stop, start or reverse the conveyer.

As illustrated in FIGS. 8 and 9, I provide an extender 150 for the hopper 110 which, it will be understood, is equally adaptable for use with the hopper 10 of FIG. 1. Said hopper extender comprises a rectangular frame made of inwardly directed, channel shaped beams 151 welded or otherwise suitably secured together at the corners. The inwardly bent, lower walls 153 of the beams 151 are slightly longer than the uppermost parallel walls 153' and are contiguously seated upon inwardly directed lips 109 of the hopper 110. Nuts 154 are preferably welded to the upper surfaces of the walls 153, and bolts 155 projected upwardly through aligned apertures in said walls 153 and lips 109 to secure the hopper extender 150 to the hopper 110.

The open, inner sides of the channel beams 151 are covered by means of guides or plates 152 welded at the uppermost edges thereof to the inwardly directed edges of the upper walls 153. Said plates 152 extend downwardly below the lowermost wall 153 and are welded thereto. Due to the difference in extent of the walls 153 and 153', the plates 152 converge in a downward direction and direct the flow of inpouring sand onto the slanted wall surfaces 111. The plates 152 prevent the sand from collecting on the walls 153 of the beams 151 and also tend to prevent the sand from becoming caked on the vertical walls of the hopper 110.

A centrally positioned, longitudinally disposed strengthening rib is provided at 160. Said rib is preferably of box construction comprising, in the form shown, a channel member 156 closed at the open side thereof by means of a plate 157. The rib 160 is welded or otherwise suitably secured to the end-most plates 152 to give rigidity to the hopper extender 150.

This newly designed hopper extender not only increases the capacity of the hopper but also eliminates material build up which is characteristic of conventional extenders. The box construction of the central rib and the converging plates on the beams more efficiently direct the flow of sand through the hopper to the conveyer and, therefore, to the spinners.

It will be understood that the mechanical type spreader of the first embodiment may be mounted intermediate the ends of the truck, as illustrated in the second embodiment of my invention, when the hopper is mounted directly to the truck frame. Also, the hydraulic actuated spreader of the second embodiment may be mounted rearwardly upon a dump type truck as shown in FIG. 1. Finally, either type of spreader may be mounted to the rear of a truck wherein the hopper is mounted directly to the truck frame.

It will be understood that numerous changes may be made in my invention, such as changes in size and dimension, without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In a sand spreader for a vehicle having a driving control station, a hopper for storing a supply of sand, a pair of chutes disposed adjacent one end of said hopper, said chutes having top entrances and bottom outlets, a conveyer mounted longitudinally beneath said hopper, a pair of shafts mounted one within each of said chutes, a pair of rotary spinners mounted adjacent the lower ends of said shafts, driving means connected to the upper ends of said shafts for rotating said shafts, said driving means connected to said conveyer, the combination wherein said hopper is provided with discharge means at either end thereof adjacent the ends of said conveyer, said driving means including reversible transmission means whereby said conveyer may be driven in either direction to either deliver sand from said container to the top entrances of said chutes or alternatively to deliver sand to discharge means at the opposite end of said hopper.

2. In a sand spreader for a vehicle, a hopper mounted upon said vehicle for carrying a supply of sand, said hopper having adjustable discharge openings at either end thereof, a pair of chutes disposed adjacent one end of said hopper, said chutes having top entrances and bottom outlets, a conveyer extending longitudinally of said hopper from one of said discharge openings to the other of said discharge openings and adapted to deliver sand from said hopper to a selected one of said discharge openings, a pair of shafts mounted one within each of said chutes, each of said shafts having a lower end projecting below the bottom outlet of the chute in which it is mounted, a pair of rotary spinners mounted one upon each of said lower ends of said shafts, gear mechanism adapted to drive said conveyer and said shafts from a common drive shaft, a pair of pivoted deflectors mounted on opposite sides of said chutes in spaced relation to said rotary spinners, said deflectors pivotable to control the spread of sand from said spinners, the combination with a prime mover, a hydraulic pump mounted to said prime mover, a supply tank for containing fluid and valve means for directing fluid from said pump through said tank back to said pump, a hydraulic motor mounted upon said common drive shaft, said valve means adapted to direct fluid under pressure from said pump through said hydraulic motor in either of two opposite directions to optionally drive said common drive shaft in either of two opposite rotative directions whereby the movement of said conveyer and said shafts may be reversed or stopped.

3. In a sand spreader for a truck-type vehicle having a control cab, a hopper for storing a supply of sand, a pair of chutes disposed adjacent one end of said hopper,

said chutes having top entrances and bottom outlets, a conveyer mounted longitudinally beneath said hopper and adapted to deliver sand therefrom to the top entrances of said chutes, a pair of shafts mounted one within each of said chutes, each of said shafts having a lower end projecting below the bottom outlet of the chute in which it is mounted, a pair of rotary spinners mounted one upon each of said lower ends of said shafts, driving means connecting the upper ends of said shafts for rotating said shafts, a gear transfer box adapted to connect said driving means of said shafts to a common drive shaft, a reduction gear box adapted to drivingly connect said conveyer with said common drive shaft, a pair of pivoted deflectors mounted on opposite sides of said chutes in spaced relation to said rotary spinners to control the spread of sand therefrom, a prime mover, the combination with starter and control means mounted in said cab for actuating said prime mover, a hydraulic pump mounted to said prime mover, a fluid supply tank, a hydraulic motor mounted to said common drive shaft, a control valve having a plurality of hydraulic lines extending therefrom and interconnecting with said hydraulic pump, said hydraulic motor and said supply tank, said valve actuable to direct fluid from said pump in two alternate opposite directions to drive said hydraulic motor in either of two opposite directions, said valve being actuable to direct the fluid from said hydraulic pump to said supply tank and back to said pump thereby by-passing said hydraulic motor, handle means for actuating said valve, remote control means mounted in said cab and adapted to move said handle of said valve, remote control means for pivoting said deflectors mounted in said cab, said hopper having adjustable discharge openings at either end thereof whereby sand may be optionally delivered either to said chutes or to the end of said hopper opposite said chutes to discharge said sand.

4. A truck-type vehicle having a driving control station, a hopper for storing a supply of sand mounted upon said vehicle, a conveyer mounted longitudinally beneath said hopper, discharge openings at either end of said hopper adjacent the ends of said conveyer, a hydraulic motor driving said conveyer, a prime mover, a hydraulic pump driven by said prime mover, a fluid supply source, a valve directing fluid through said hydraulic motor in either of two opposite directions to drive said conveyer to convey sand optionally to either end of said hopper, said valve adjustable to direct the fluid whereby it by-passes said hydraulic motor and returns to said supply source.

5. A truck-type vehicle having a driving control station, a hopper for storing a supply of sand mounted upon said vehicle, a conveyer mounted longitudinally beneath said hopper, adjustable discharge openings at either end of said hopper adjacent the ends of said conveyer, a hydraulic motor driving said conveyer, a prime mover, a hydraulic pump driven by said prime mover, a fluid supply source, a valve having a plurality of hydraulic lines interconnecting said hydraulic motor, said pump, and said supply source therewith, said valve adjustable to direct fluid through said hydraulic motor in either of two opposite directions to drive said conveyer to convey sand optionally to either end of said hopper, said valve adjustable to direct the fluid whereby it by-passes said hydraulic motor and returns to said supply source, a handle for actuating said valve, and remote control means mounted at said control station for actuating said handle.

6. A truck-type vehicle having a control cab, a hopper for storing a supply of sand mounted upon said vehicle,

a conveyer mounted longitudinally beneath said hopper, adjustable discharge openings at either end of said hopper adjacent the ends of said conveyer, a hydraulic motor driving said conveyer, a prime mover, a hydraulic pump mounted upon said prime mover, a fluid supply tank, a valve having a plurality of hydraulic lines interconnecting said hydraulic motor, said pump, and said tank therewith, said valve directing fluid through said hydraulic motor in either of two opposite directions to drive said conveyer to convey sand optionally to either end of said hopper, said valve adjustable to direct the fluid whereby it by-passes said hydraulic motor and returns to said supply tank, a handle for actuating said valve, remote control means mounted in said cab for actuating said handle, and remote control means mounted in said cab for starting and controlling the speed of said prime mover.

7. A combined sand spreading and material delivering vehicle comprising a chassis, a control cab, a hopper mounted upon said chassis having discharge openings at either end thereof, a conveyer mounted longitudinally beneath said hopper and adapted to deliver sand to either of said openings, sand spreading mechanism mounted adjacent one end of said hopper, power means for actuating said sand spreading mechanism and said conveyer, and control means mounted within said cab for actuating said sand spreader and said conveyer whereby said conveyer may be driven to move sand in the direction of said sand spreading mechanism or whereby said conveyer may be reversed to deliver said sand to the end of said hopper opposite said sand spreading mechanism to discharge the same from said hopper.

8. In a sand spreader for a vehicle, a hopper mounted upon said vehicle for carrying a supply of sand, said hopper having adjustable discharge openings at either end thereof, chute means disposed adjacent one end of said hopper, said chute means having top and bottom outlets, a conveyer extending longitudinally of said hopper from one of said discharge openings to the other of said discharge openings and adapted to deliver sand from said hopper to a selected one of said discharge openings, shaft means mounted within said chute means, said shaft means having a lower end projecting below the bottom outlet of the chute in which it is mounted, spinning mechanism mounted upon a lower end of said shaft means, gear mechanism adapted to drive said conveyer and said shaft means from a common drive shaft, the combination with a prime mover, a hydraulic pump mounted to said prime mover, a supply tank for containing fluid and valve means for directing fluid from said pump through said tank back to said pump, a hydraulic motor mounted upon said common drive shaft, said valve means adapted to direct fluid under pressure from said pump through said hydraulic motor in either of two opposite directions to optionally drive said common drive shaft in either of two opposite rotative directions whereby the movement of said conveyer and said shaft means may be reversed or stopped.

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Disclaimer

2,988,368.—*Donald R. Kerr*, Bucyrus, Ohio. SAND SPREADING MECHANISM WITH REVERSIBLE CONVEYER. Patent dated June 13, 1961. Disclaimer filed May 24, 1965, by the assignee, *Shunk Manufacturing Company, Inc.*

Hereby enters this disclaimer to claims 4, 5, 6 and 7 of said patent.

[*Official Gazette June 29, 1965.*]