

Dec. 29, 1931.

C. H. NABER ET AL

1,838,631

ROAD SPREADER

Filed June 19, 1928

2 Sheets-Sheet 1

Fig. 1.

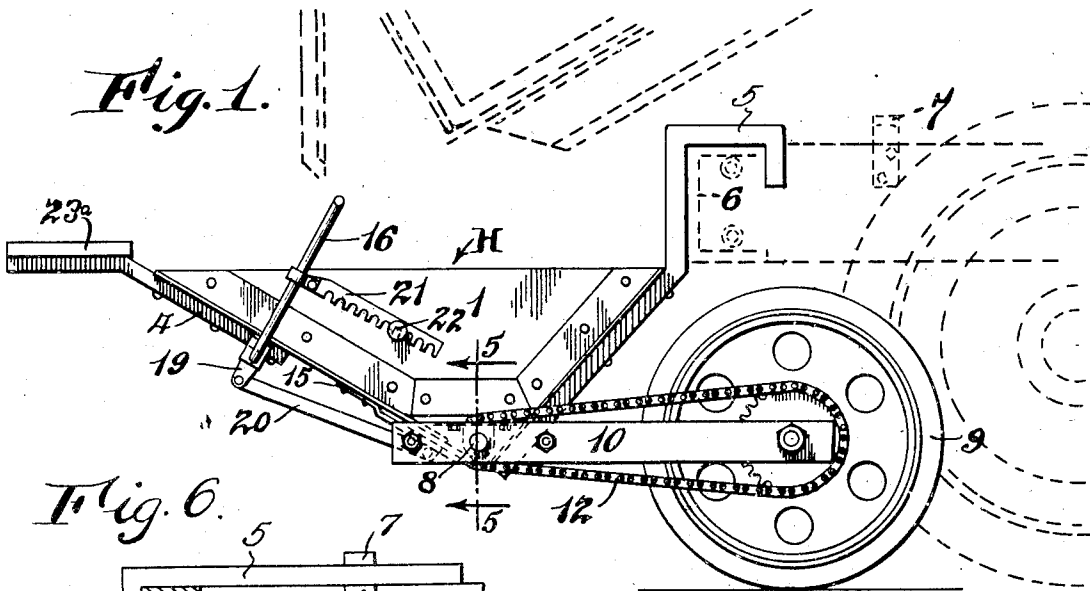


Fig. 6.

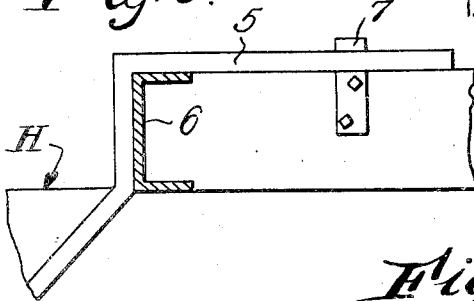


Fig. 2.

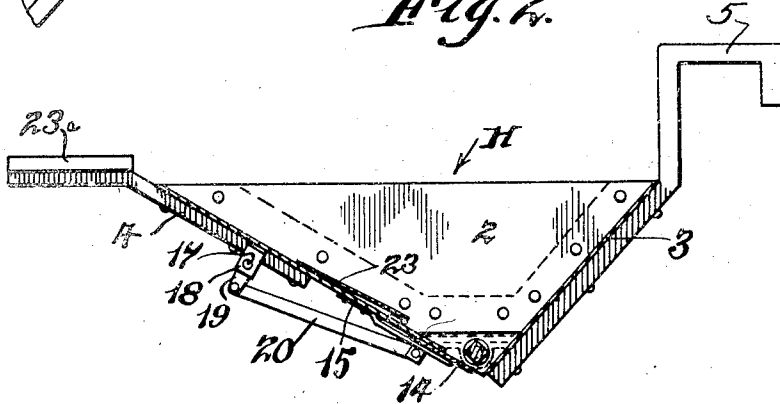
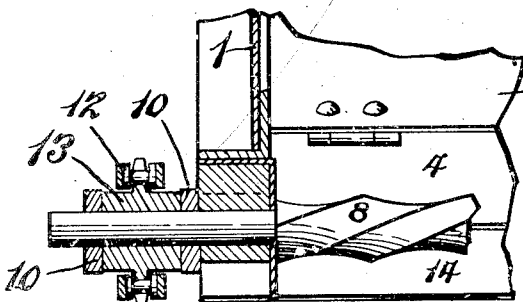


Fig. 5.



Inventor

*Claude H. Naber
& Clarence Holliday*

By

Popp & Powers

Attorney

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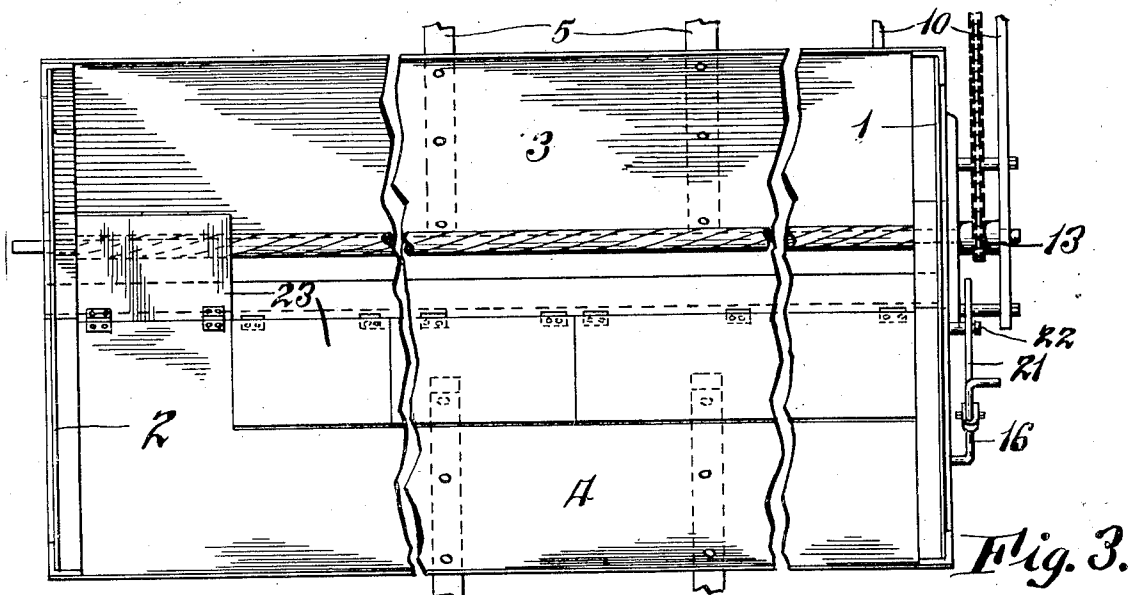
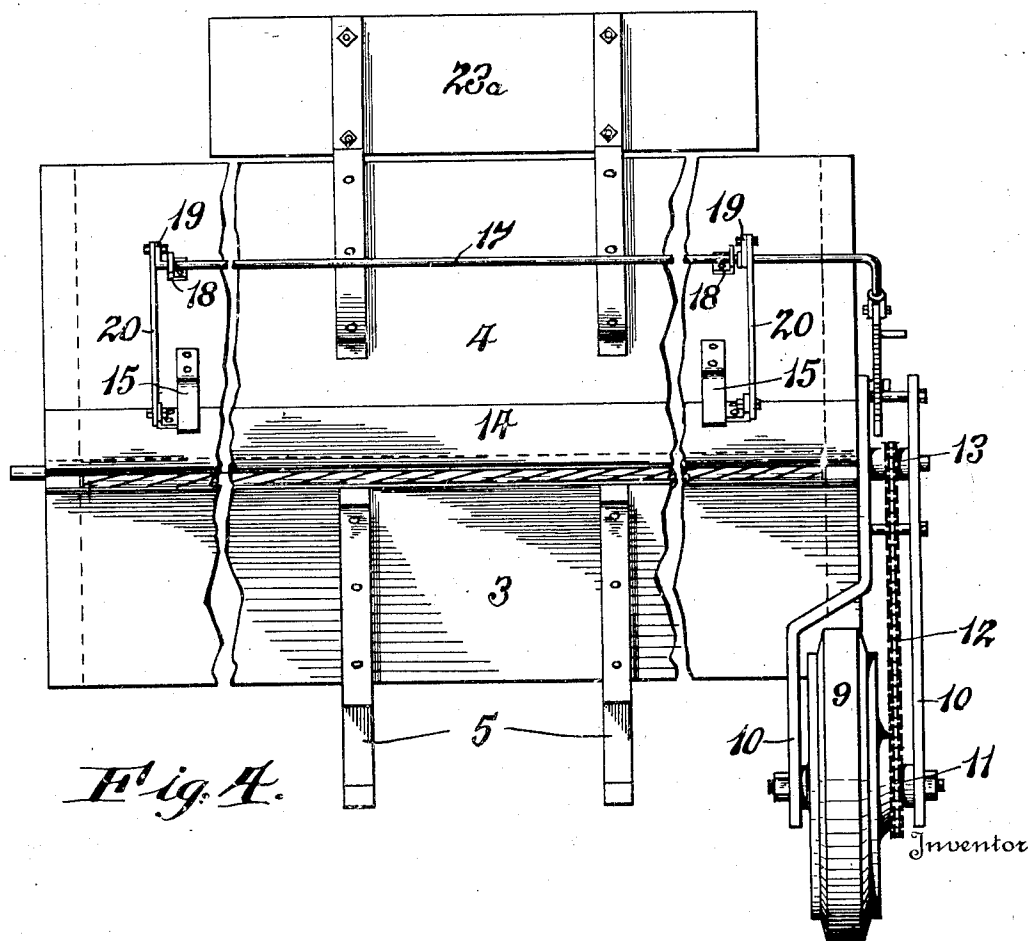
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2 Sheets-Sheet 2



Claude H. Naber &
Clarence Holliday
By Popp & Powers Attorney

UNITED STATES PATENT OFFICE

CLAUDE H. NABER AND CLARENCE HOLLIDAY, OF HAMBURG, NEW YORK, ASSIGNORS
TO N & H SPREADERS, INC., OF HAMBURG, NEW YORK, A CORPORATION OF NEW
YORK

ROAD SPREADER

Application filed June 19, 1928. Serial No. 286,699.

This invention relates to an improved spreader which is primarily intended for, but not necessarily limited to, use on a dumping truck wherein it functions to receive material such as chip stone, which is dumped from the truck body and to spread such material over the surface of a road. The spreader is of the type which has a hopper adapted for attachment to the truck and an agitator shaft for maintaining the material within the hopper in a loose condition to insure a uniform and even feed.

In the constructions of this type as heretofore proposed, the practice has been to drive the agitator shaft either from the driving system of the truck or from the ground through an auxiliary wheel, the latter having, in such case, the additional function of supporting the spreader as a whole. In the first mentioned drive, the connection between the driving system is a positive one in which the agitator shaft must rotate as long as the truck moves. In the auxiliary drive, the weight of the hopper is sufficient to press the wheel against the surface of the road with such force as to amount to a drive equally as positive as the first mentioned drive. A positive drive has the objection, however, that it will cause a disruption of one or more parts of the driving connection or associated parts when any of the material being spread wedges between the shaft and hopper so tightly as to lock the shaft against rotation. This is particularly liable to happen when spreading a rough, hard material such as chip stone, the size of the pebbles varying considerably.

An object of this invention is to avoid the above objection and, therefore, to provide a driving means which is arranged to slip when the agitator shaft is locked against rotation.

Another object of the invention is to provide a spreader which can be quickly and easily attached to or removed from the various types of dumping trucks now in common use.

A further object is to provide means for varying both the length and width of the hopper outlet whereby the strip of material being spread may be controlled both as to quantity and dimensions, and to arrange the

width controlling means with respect to the shaft so that such means may be utilized to effect the quick release of the material which becomes wedged between the shaft and hopper.

An embodiment of a spreader embodying the features of the invention is illustrated in the accompanying drawings, wherein:

Fig. 1 is a side elevation of the spreader as it appears when attached to a truck, the latter being indicated by dotted lines.

Fig. 2 is a transverse section, through the vertical center of the spreader.

Fig. 3 is a top plan view showing one of the outlet opening blocking doors in its operative position, parts of the spreader being omitted.

Fig. 4 is a bottom plan view.

Fig. 5 is a section along line 5—5 of Figure 1.

Figure 6 is a fragmentary view showing a modified form of securing means for the spreader.

The spreader, as stated, includes a hopper and an agitator shaft. The hopper which is indicated generally at H, may be of any suitable construction, the construction shown consisting of vertical side walls 1 and 2 and downwardly converging front and rear walls 3 and 4, all of which are suitably secured together. The lower marginal edges of the front and rear walls 3 and 4 are spaced apart to provide a discharge opening from which the spreading material emerges as it is being fed to the road.

For the purpose of securing the spreader to a truck, the front wall 3 is provided with a pair of forwardly extending arms 5 which are of hook shape whereby they may be hooked over the rear cross member 6 (indicated in dotted lines in Fig. 1) of the truck chassis. This mode of attachment has the advantage of permitting the spreader to be attached to, or removed from the truck in a relatively short time whereby one spreader may be efficiently utilized with several trucks in which case it is operated to spread the material of one truck while the others are being loaded. If desired, the arms 5 may extend straight instead of being of hook shape. With straight

arms, the securement is effected by placing the arms over the rear cross member 6 and under the member 7 which is also attached to the truck chassis. This mode of securement permits the use of a narrow hopper which can be adjusted backward or forward relatively to the cross member 6 and according to the overhang of the truck body and thereby centered with respect to the stream of material flowing from the truck, whereas when hook-shaped arms are used, the overhang is taken care of by the use of a wide hopper. In any case, the truck is secured without the use of fastening means and this feature materially increases the efficiency of the spreader.

The agitator shaft 8 extends parallel to the discharge opening and below the horizontal plane of the lower marginal edge of the rear wall 4, it being noted that this edge is elevated with respect to the lower marginal edge of the front wall 3. The ends of the shaft project through the vertical side walls 1 and 2 of the hopper and are journaled in suitable bearings. This shaft may be of any suitable form and as shown is made in the form of a spiral. The agitator shaft 8 is driven by means which include a frictionally driven element which is arranged to slip when the shaft encounters an obstruction to its rotation.

The frictionally driven element referred to preferably comprises the auxiliary wheel 9 which, as shown, frictionally engages the road. The wheel 9 is journaled in a bracket 10 which, in turn, is loosely or pivotally mounted on a projecting end of the shaft 8. The wheel 9 carries a sprocket 11 which is connected by a chain 12 to a sprocket 13 fixed on the agitator shaft. Obviously a movement of the truck causes the wheel 9 to rotate and therefore to drive the shaft through the chain and sprocket connection mentioned. It will be noted, however, that the manner in which the wheel is mounted permits it to follow the elevations and depressions of the road whereby it is continuously effective to drive the shaft. It is also noted that the wheel does not support the hopper but merely supports its own weight plus part of the weight of the bracket in which it is journaled. The wheel therefore, bears against the road with a relatively light force as compared to the auxiliary wheels of prior constructions which support the hopper and therefore provide, in effect, a positive drive. This light force on the wheel 9 is sufficient to maintain the rotation of the wheel, and consequently the drive of the shaft, under normal operating conditions but it is insufficient to compel the continued rotation of the wheel when the shaft is locked against rotation by the wedging of material against the shaft.

It is also insufficient to effect the disruption of any parts connecting the wheel and shaft. The wheel, therefore, functions as a friction element which upon the locking of

the shaft, slips relatively to the member which it engages that is to say the road and thereby limits to a safe value, the stresses set up in the driving means and associated parts.

The thickness of the strip of material being spread is regulated by a door or gate 14 which is slidably secured to the rear wall 4 of the hopper and laterally coextensive therewith. The door or gate is slidably held against the rear wall 4 by brackets 15 secured to the wall and extending over the door toward the discharge opening. The movement of the door or gate is effected through an operating lever 16 which extends along one side of the hopper and has its lower end secured to a shaft 17, the latter being journaled in lugs 18 formed on, or secured to the wall 4. The shaft 17 carries one or more fixed arms 19, the outer ends of which are pivotally connected to links 20. The other end of the links 20 is pivotally connected to the sliding door 14. Obviously a movement of the operating lever 16 effects a movement of the arm 19 through the shaft 17 and such movement of the arm 19 effects a corresponding movement of the sliding door through the link 20, the door being movable, of course, fully across the space delimited by the lower marginal edges of the walls 3 and 4. It is noted that the door 14 being inclined, facilitates the discharge of material through the opening and does not tend to build up material at the opening with the result of clogging it as would be the case if the door were horizontally arranged. It is also noted that the door is arranged to extend the discharge opening upwardly beyond the horizontal plane of the lower side of the agitator shaft.

This works to advantage inasmuch as the truck, is ordinarily run backward in spreading material such as chip stone over an oiled road, and when so operated the agitator shaft drives the material toward the sliding door side of the hopper. As a result any material wedging between the shaft and hopper must wedge against the door and may, therefore, be quickly released by sliding the door to its full open position.

In order to hold the door at any desired position, the operating lever 16 carries a rack 21, the teeth of which cooperate with a pin 22 which is secured to a side wall of the hopper, to lock or latch the lever in any position to which it is moved. This arrangement also permits the lever to be moved quickly to the full open position to release the wedged material and then quickly moved back to its normal position.

The width of the strip of material being spread may be regulated by a series of doors 23 which are hinged to the inner surface of one of the converging walls 3 or 4. These doors normally extend upwardly against the surface of the wall but when it is desired to

decrease the width of the strip, one or more doors may be swung over the agitator shaft to block the discharge opening to the extent desired. The arrangement of the doors 23 in such a manner that when they are moved to block off a part of the discharge opening they extend over the agitator shaft, has two distinct advantages. First it enables a reduction in the power required to operate the agitator shaft which is proportionate to the number of doors moved to an operative position. In other words, although the agitator shaft extends the entire length of the discharge opening the arrangement of the doors is such that when closed material is not fed to that portion of the shaft which extends beneath the closed doors. There being no material acted upon by the agitator shaft beneath the closed doors no power is wasted in rotating the shaft in material which is not being discharged from the hopper. Hence there is no wearing of that portion of the agitator shaft which lies above that portion of the discharge opening which is not availed of. When the spreader is in operation, the last portion of the material contained in the truck usually feeds unevenly to the hopper. It is necessary to level this material in the hopper to insure an even feed to the road and this operation may be performed by one of the workmen. With an oiled road, however, the workman cannot walk along the truck to do so but must be supported on the truck or hopper. To this end, the hopper is provided with the rearwardly extending step or ledge 23a upon which the workman may stand.

It is to be understood that the spreader may be used to spread any loose material. Where it is utilized to spread a hard rough material under conditions which permit the truck to be run forward, the front wall of the hopper is preferably provided with a door arranged similarly to the door 14 inasmuch as the rotation of the agitator shaft is reversed in such case, and the material will therefore tend to wedge between the shaft and the front wall 3. If desired, however, the door may be mounted so as to spring outward upon the wedging of material to thereby effect its release.

We claim as our invention:

1. A spreader of the class described comprising a hopper having inclined front and rear walls, the lower portions of which delimit an outlet opening and the lower edge of one wall portion being elevated with respect to the lower edge of the other wall portion, an agitator shaft extending over said discharge opening and below the horizontal plane of said elevated edge, a gate slidably mounted on the elevated wall portion for inclined movement across said opening to vary the width of the opening, means for moving said gate and doors mounted on one of said walls for movement to either of two posi-

tions, in one of which they extend over the said agitator shaft and outlet opening to cut off a corresponding portion of said opening.

2. A spreader of the class described comprising a hopper having inclined front and rear walls, the lower portions of which delimit an outlet opening and the lower edge of one wall portion being elevated with respect to the lower edge of the other wall portion, an agitator shaft extending over said discharge opening and below the horizontal plane of said elevated edge, a gate slidably mounted on the elevated wall portion for inclined movement across said opening to vary the width of the opening, means for moving said gate, means for holding said gate in any position to which it may be moved, said moving and holding means cooperating to permit the door to be moved quickly to full open position to release material wedged between the shaft and the door and a series of doors mounted on said hopper and separably movable to one position wherein they extend along the inner surface of one of said walls and to another position wherein they extend over the said agitator shaft and outlet opening to block off a corresponding portion of said opening.

3. A spreader of the class described comprising a hopper having front and rear walls, the lower portions of which delimit an outlet opening, an agitator shaft arranged in said hopper adjacent said opening and doors mounted on one of said walls for movement to either of two positions in one of which they extend over the said agitator shaft and outlet opening to block off a corresponding portion of said opening.

4. A spreader of the class described comprising a hopper having front and rear walls, the lower portions of which delimit an outlet opening, an agitator shaft arranged in said hopper adjacent said opening and a series of doors mounted on said hopper and separately movable to one position wherein they extend along the inner surface of one of said walls and to another position wherein they extend over the said agitator shaft and outlet opening to block off a corresponding portion of said opening.

5. In a spreader for attachment to a truck which includes a chassis and a body carried by said chassis tiltable relative thereto to enable the discharge of the contents of said body by gravity, the combination of a hopper arranged beneath the discharge end of said body for receiving the material so discharged, an agitator shaft in said hopper, means operable upon movement of said vehicle to drive said shaft, said means including an element which is arranged to limit to a safe value the stresses set up by the wedging of material against said shaft and means independent of the drive means for said shaft and including said chassis for support-

ing the entire weight of said hopper as so arranged and any material delivered to it, said supporting means including a direct connection between said hopper and said chassis.

5 6. In a spreader for attachment to a truck which includes a chassis and a body carried by said chassis tiltable relative thereto to enable discharge of the contents of said body
10 by gravity, the combination of a hopper arranged beneath the discharge end of said body for receiving the material so discharged, an agitator shaft in said hopper, means operable upon the movement of said
15 vehicle to drive said shaft, said means including a frictionally driven element which is arranged to slip when the shaft encounters an obstruction to its rotation, thereby to limit to a safe value the stresses set up in the
20 machine and means independent of the drive means for said shaft and including said chassis for supporting the entire weight of said hopper as so arranged and any material delivered to it, said supporting means
25 including direct connection between said hopper and said chassis.

7. In a spreader for attachment to a truck which includes a chassis and a body carried by said chassis tiltable relative thereto to enable discharge of the contents of said body
30 by gravity, the combination of a hopper arranged beneath the discharge end of said body for receiving the material so discharged, an agitator shaft in said hopper, a
35 wheel operably connected to said shaft and arranged to drive the shaft upon movement of said vehicle, said wheel being arranged to slip when the shaft encounters an obstruction to its rotation, thereby to limit to a safe
40 value the stresses set up in the machine and means independent of said wheel and including said chassis for supporting the entire weight of said hopper as so arranged and any material delivered to it, said supporting
45 means including a direct connection between said hopper and said chassis.

8. In a spreader for attachment to a truck which includes a chassis and a body carried by said chassis tiltable relative thereto to enable discharge of the contents of said body
50 by gravity, the combination of a hopper, an agitator shaft in said hopper, a wheel arranged to frictionally engage the road and operably connected to said shaft to drive the
55 same upon movement of said vehicle, said wheel bearing against the road with a force sufficient to drive the shaft under normal operating conditions but which permits the wheel to slip over the road when material
60 becomes tightly wedged between the shaft and the hopper and means independent of said wheel and including said chassis for supporting the entire weight of said hopper and any material delivered to it.

65 9. In a spreader for attachment to a truck

which includes a chassis and a body carried by said chassis tiltable relative thereto to enable discharge of the contents of said body by gravity, the combination of a hopper having front and rear walls, means secured to a wall of said hopper and arranged to co-operate with the said chassis to support the entire weight of said hopper and its contents from said chassis, said hopper being supported in a position to receive the material discharged from the body of said truck and being at all times instantly attachable to or removable from the vehicle.

10. In a spreader for attachment to a truck which includes a chassis and a body carried by said chassis tiltable relative thereto to enable discharge of the contents of said body by gravity, the combination of a hopper having front and rear walls, a pair of arms secured to a wall of said hopper and extending outwardly therefrom, said arms being formed to fit over the cross member of said chassis to support the entire weight of the hopper and its contents from the chassis, said hopper being supported to receive the material discharged from said body and being at all times instantly attachable to or removable from the vehicle.

In testimony whereof we hereby affix our signatures.

CLAUDE H. NABER.
CLARENCE HOLLIDAY.