Aug. 17, 1965 F. A. BERNHARDT 3,201,006

SALT SPREADER

Original Filed Oct. 12, 1962 2 Sheets-Sheet 1

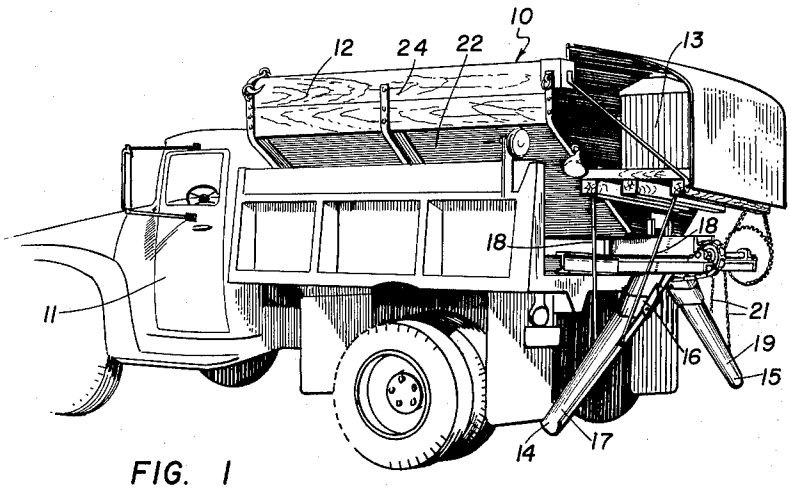


FIG. 1

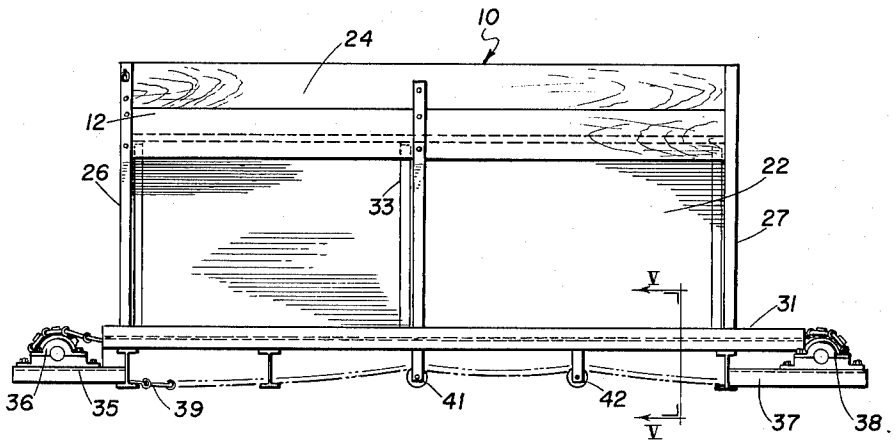


FIG. 2

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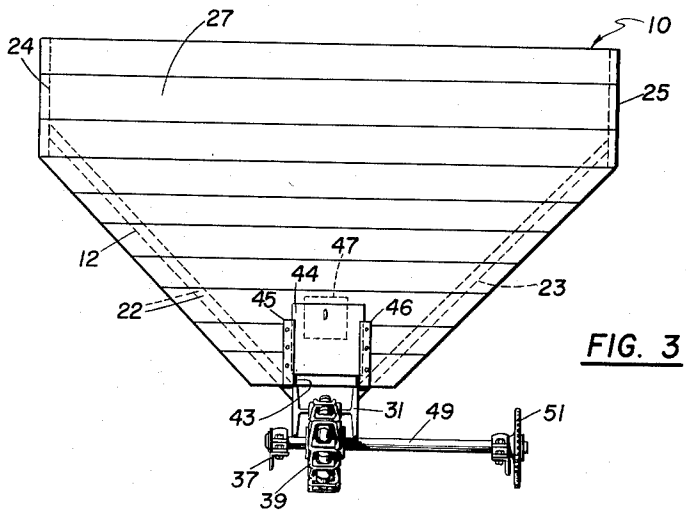


FIG. 3

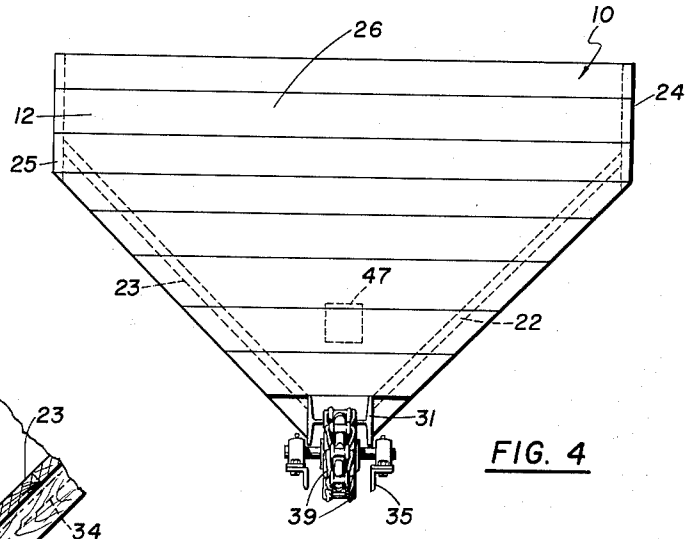


FIG. 4

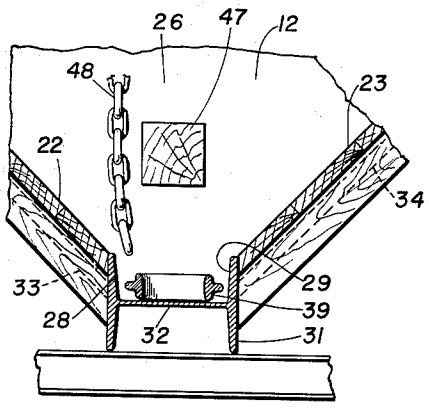


FIG. 5

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3,201,006

SALT SPREADER

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Continuation of abandoned application Ser. No. 230,096, Oct. 12, 1962. This application Mar. 8, 1965, Ser. No. 446,761

1 Claim. (Cl. 222—330)

This invention relates to a salt spreader and, more particularly, to apparatus arranged, to direct a stream of dry chemicals from the rear of a vehicle. This is a continuation of my patent application Serial No. 230,096, filed October 12, 1962, now abandoned.

In snow removal operations on roads, it is common practice to spread quantities of salt or other chemicals on the top of ice and snow in the road. This operation is usually performed by releasing the salt in a stream from a hopper at the rear of a truck and it is common practice to broadcast the salt by means of a rotating sprinkler. However, the necessity of removing the salt from the hopper through a single opening has resulted in very awkwardly-shaped hoppers which are capable of self-feeding through the exit opening. This restriction in hopper design, in turn, means that the hopper is capable of carrying substantially less salt than otherwise would be preferable. Furthermore, it is common to provide a truck whose sole purpose is the spreading of salt and, of course, this represents a waste of capital equipment which is not used during the warmer months. These and other difficulties experienced with the prior art devices have been obviated in a novel manner by the present invention.

It is, therefore, an outstanding object of the invention to provide a salt spreader of very rugged construction which is capable of a long life of useful service with a minimum of maintenance.

Another object of this invention is the provision of a salt spreader which is capable of operating with a hopper of large capacity.

A further object of the present invention is the provision of a salt spreader having a novel method of presenting the salt stream to the road.

It is another object of the instant invention to provide a salt spreader which is independent of the vehicle on which it is mounted, which has its own drive, and which has a means for regulating its speed of operation independently of the speed of the vehicle on which it is mounted.

It is a further object of the invention to provide a salt spreader in which the feed of salt may be closely controlled.

With these and other objects in view, as will be apparent to those skilled in the art, the invention resides in the combination of parts set forth in the specification and covered by the claim appended hereto.

The character of the invention, however, may be best understood by reference to one of its structural forms as illustrated by the accompanying drawings in which:

FIG. 1 is a perspective view of a salt spreader embodying the principles of the present invention;

FIG. 2 is a side view of the apparatus;

FIG. 3 is a rear end view of the apparatus with certain elements removed;

FIG. 4 is a front elevational view of the apparatus; and

FIG. 5 is a sectional view of the apparatus taken on the line V—V of FIG. 2.

Referring first to FIG. 1, wherein is best shown the general features of the invention, the salt spreader, indicated generally by the reference numeral **10**, is shown mounted on a truck **11**. The salt spreader consists of a hopper **12** of V-shaped cross-section at the rear of

which is mounted a gasoline engine **13**. Also mounted at the rear of the hopper are two chutes **14** and **15**. The chute **14** consists of an inner portion **16** which is fixed to the hopper and an outer portion **17** which is hingedly connected at its inner end to the inner portion. The outer portion **17** is supported by bars **18** and is capable of moving from an operative position, as shown in the drawing, to an upper inoperative position wherein it is directed upwardly instead of downwardly. The chute **15** is similarly provided with hinged inner and outer portions, the outer portion **19** being supported by chains **21** which may be shortened to support the outer portion in an upwardly-directed inoperative position.

Referring to FIGS. 2, 3, and 4, it can be seen that the hopper **12** is formed with inclined sides **22** and **23** which form the V and which terminate at their upper ends in straight sides **24** and **25**. Similarly, the hopper is provided with ends **26** and **27**. The sides and ends are formed of heavy wooden planks, this material being selected because it is readily replaced and is less subject to corrosion by the chemicals than would be a steel body. The bottoms of the sides **22** and **23** rest on the flanges **28** and **29** of an H-beam **31** having a horizontal web **32** extending between the flanges. The sides **22** and **23** rest on the upper edges of the flanges **28** and **29**, respectively, and bracing angle irons **33** and **34** extend downwardly to assist in supporting the hopper.

The front end of the hopper **12** is provided with a supporting base **35** on which is mounted a sprocket wheel **36**. At the rear end, the hopper is similarly provided with a supporting base **37** which also carries a sprocket wheel **38**. Extending around the sprocket wheels is an endless chain **39** of the open-link type which, because of the generally square conformation, not only fits well over the pins of a sprocket wheel but also make excellent drag links for conveying the salt out of the hopper. The chain **39** lies on the upper surface of the web **32** of the beam **31** as it passes through the hopper, passes around the sprocket **38**, extends under the bottom of the hopper (with its bight of the lower run resting on idler wheels **41** and **42**) and returns in its upper run to pass through the hopper lying on the upper surface of the web **32**. As is evident in FIG. 4, the chain enters the forward end of the hopper readily because of the opening presented by the lower edge of the end member **26** and the space between the web **32** and the flanges **28** and **29**. At the rearward end an additional opening **43** extends upward from the lower edge of the end **27**. An adjustable door **44** extends over the upper part of this opening and is slidable within guides **45** and **46** which also are provided with screws making it possible to tighten the door and lock it in place. Extending through the hopper from one end to the other is a beam **47** which is made of wood and which overlies the beam **31**, for a purpose to be explained hereinafter. Also mounted in the hopper fastened in the upper part of one of the sides but extending downwardly between a side **22** or **23** and the beam **47** is a length of ordinary chain **48**.

The sprocket **38** at the rearward portion of the hopper is keyed to a shaft **49** having a sprocket wheel **51** at its opposite end. This wheel is connected to the gasoline engine **13** for driving the chain.

The operation of the invention will now be readily understood in view of the above description. The salt spreader **10** is mounted on a truck **11** and the truck proceeds along the road on which it is desired to distribute salt. The gasoline engine **13** is started and drives through the sprocket wheel **51** and the shaft **49** to move the chain **39** so that its upper run moves rearwardly through the hopper. Salt contained in the hopper **12** slides down the sides **22** and **23** and falls onto the moving chain. The

open links of the chain form, with the upper surface of the web **32** of the beam **31** on which they rest, pockets of considerable size into which the salt passes and which carries it out of the hopper. A considerable body of salt other than that carried in the pockets so formed also moves out of the opening **43** at the rear of the hopper, the amount of this body being regulated by the adjustment of the door **44**, thus regulating the size of the gap formed by the web **32**, the flanges **28** and **29** of the beam **31**, the sides of the opening **43**, and the lower edge of the door **44**. Since a portion of the chain **39** extends outwardly of the rear of the hopper a considerable distance, the salt is carried a substantial distance rearwardly of the hopper before it is permitted to fall downwardly. As is evident in FIG. 2, the chain **39** leaves the beam **31** a short distance from the tangent point of the sprocket wheel **38** and the salt, therefore, falls downwardly and to the side because of the removal of the support furnished by the web **32** and the flanges **28** and **29**. The chutes **14** and **15** are mounted to receive the salt as it leaves the chain and to distribute it laterally generally in a windrow longitudinally of the road more or less in line with the path which the wheels of the truck **21** have taken. If desired, the lower portion **17** of the chute **14** or the lower portion **19** of the chute **15** may be raised to an inoperative position so the salt flows down one chute only ao provide a higher concentration on the road. It has been found by the applicant that the provision of salt in a single line in very substantial quantities performs a better job of melting the snow and ice than is provided by a broadcast distribution of the salt lightly over the whole area of the road. Apparently, the heavy concentration of salt forms a pool which readily spreads laterally under the action of traffic to melt the snow and ice. The beam **47** serves the purpose of relieving the chain **39** of the direct pressure load of the salt in the hopper. The chain **48**, by moving around under the action of the movement of the truck, serves to break up any accumulations of salt which may block free flow downwardly onto the chain **39**.

It can be seen that the salt spreader is a separate, self-contained unit which may be readily mounted in the back of a truck but which may also be readily removed by use of block-and-tackle. The construction is very strong and the positive drive of the chain through the body of salt in the hopper causes a positive feed in readily regulatable amounts.

It is obvious that minor changes may be made in the form and construction of the invention without departing from the material spirit thereof. It is not, however, desired to confine the invention to the exact form herein shown and described, but it is desired to include all such as properly come within the scope claimed.

The invention having been thus described, what is claimed as new and desired to secure by Letters Patent is:

A spreader for salt and the like, comprising

(a) a main hopper having sloping sides which approach each other at their lower edges to form a longitudinally-extending horizontal vertex, and having an H-shaped beam mounted in the bottom of the hopper, the said beam having a portion which extends beyond the rear of the hopper,

(b) an endless chain of open-link type which forms upwardly-directed pockets with the upper surface of the web of the beam between the flanges thereof and having an upper run which extends through the bottom of the hopper along the said horizontal vertex, said endless chain being mounted on sprockets mounted in spaced relationship beyond the ends of said H-beam whereby salt being carried by said chain is permitted to fall free of said chain and the edge of the web of said beam, and

(c) a pair of chutes each having one end positioned to receive said falling salt and adapted to convey the salt laterally to deposit a row of salt from each chute, the chutes each having a hinged outer portion which may be moved to an upwardly-directed inoperative position.

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