

Jan. 18, 1966

R. E. BRAMMER

3,229,983

MATERIALS SPREADER MACHINE

Filed Jan. 6, 1964

3 Sheets-Sheet 1

FIG. 1

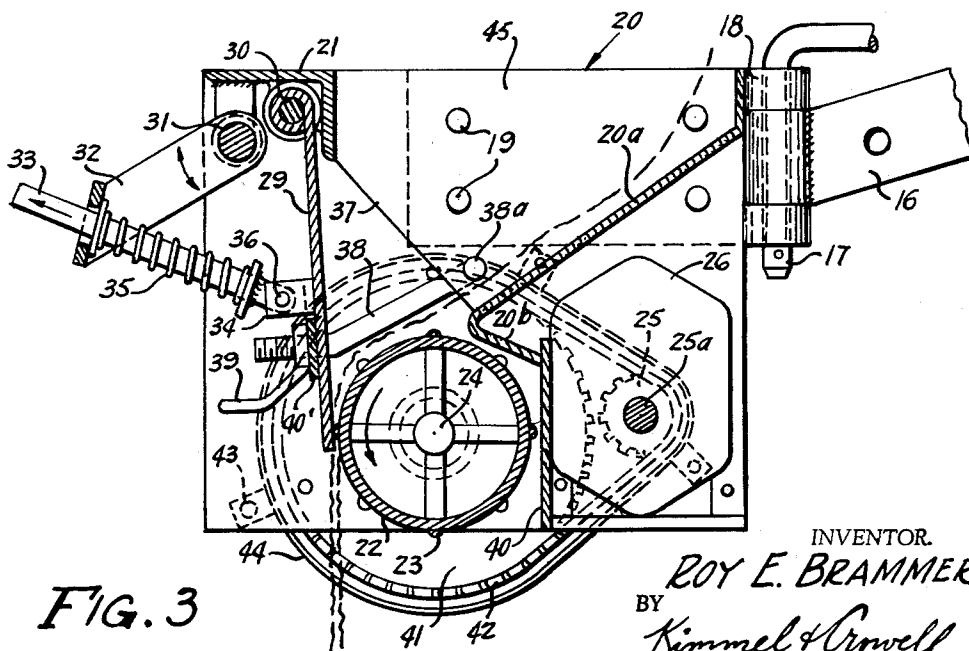
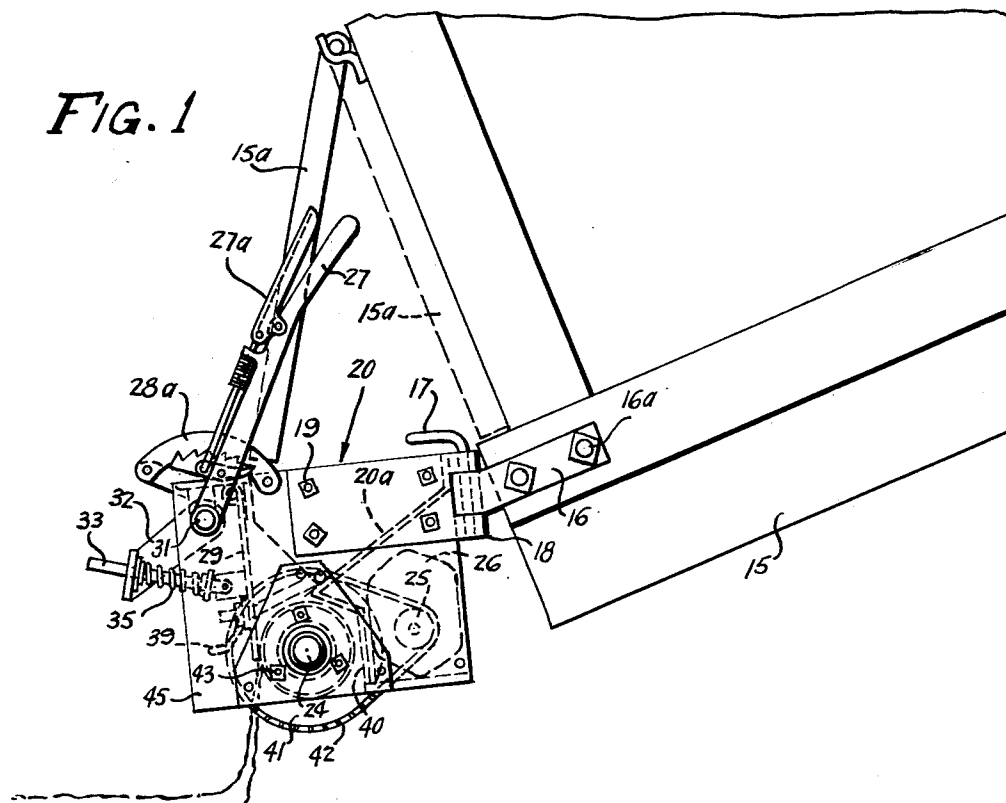


FIG. 3

INVENTOR.
ROY E. BRAMMER
BY
Kimmel & Crowell
ATTORNEYS.

Jan. 18, 1966

R. E. BRAMMER

3,229,983

MATERIALS SPREADER MACHINE

Filed Jan. 6, 1964

3 Sheets-Sheet 2

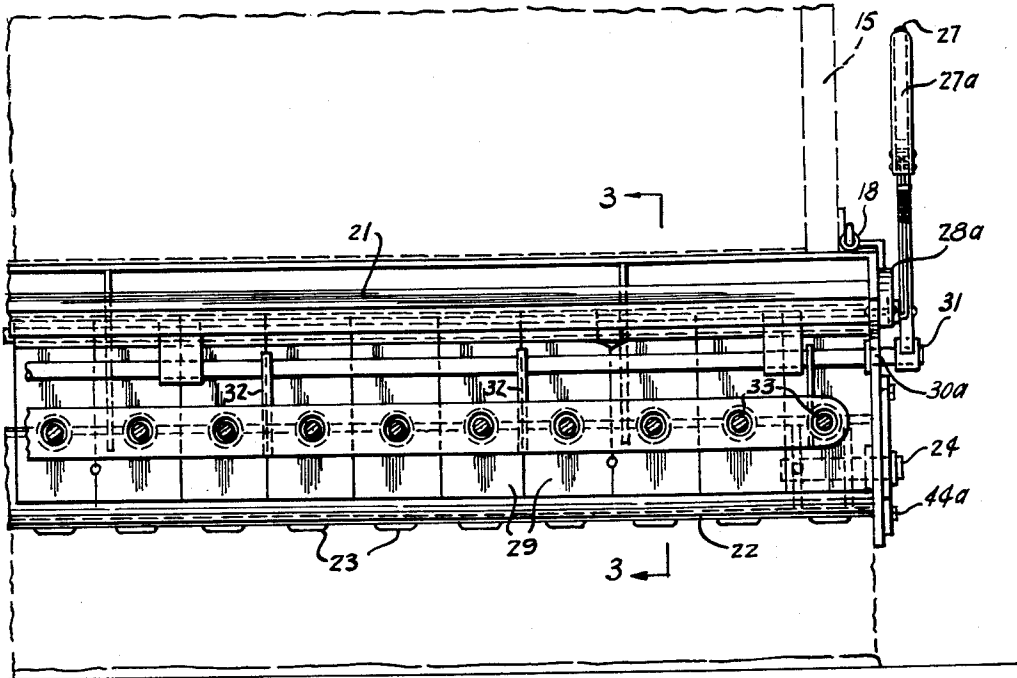


FIG. 2

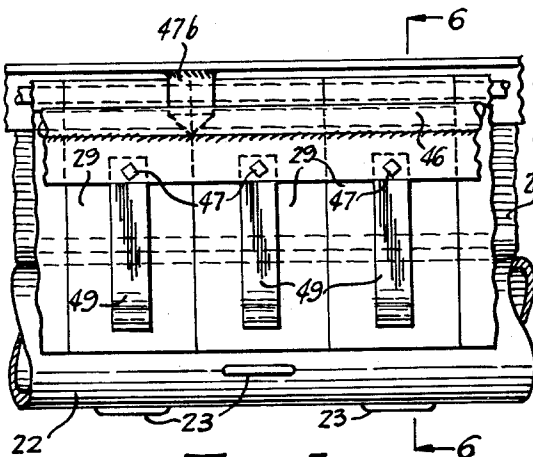


FIG. 5

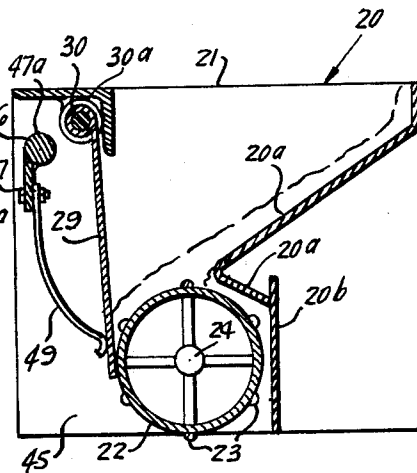


FIG. 6

INVENTOR.
ROY E. BRAMMER
BY
Kimmel & Crowell
ATTORNEYS.

Jan. 18, 1966

R. E. BRAMMER

3,229,983

MATERIALS SPREADER MACHINE

Filed Jan. 6, 1964

3 Sheets-Sheet 3

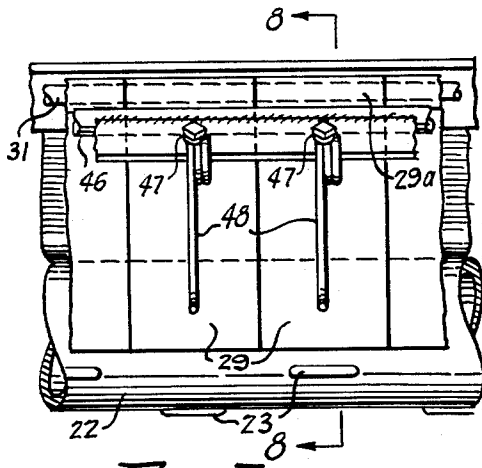


FIG. 7

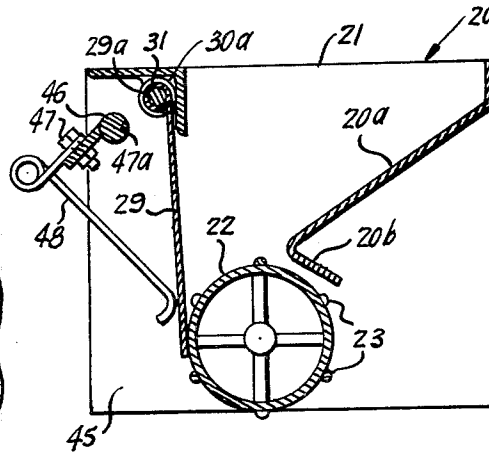


FIG. 8

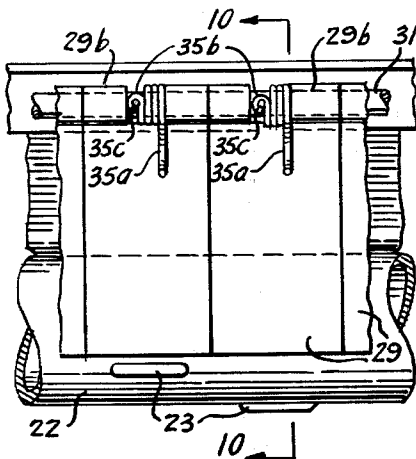


FIG. 9

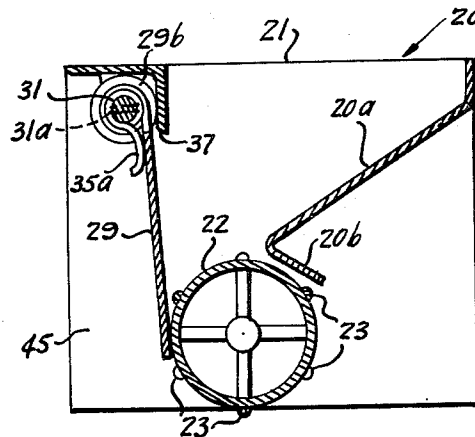


FIG. 10

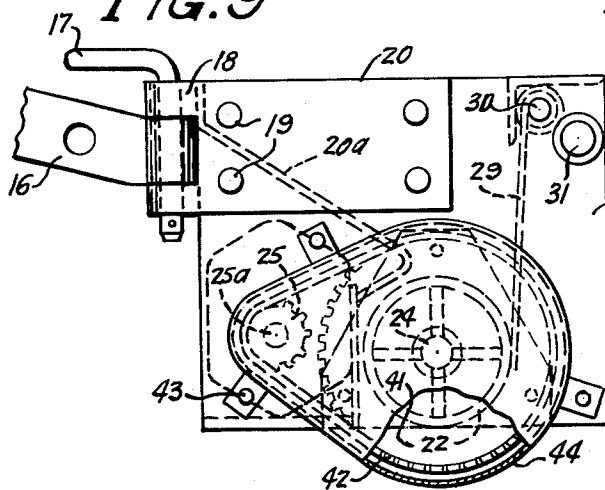


FIG. 4

INVENTOR
ROY E. BRAMMER
BY
Kimmel & Crowell
ATTORNEYS.

1

2

3,229,983
MATERIALS SPREADER MACHINE
 Roy Edward Brammer, Monroe Heights, Salineville, Ohio
 Filed Jan. 6, 1964, Ser. No. 335,837
 4 Claims. (Cl. 275—2)

This invention relates to improvements in aggregate type of spreader machines.

More particularly, this invention relates to an aggregate type of spreader machine for efficient, economical, and selective spreading of sand, stone, gravel, salts, calcium-chloride, or other bulk materials.

Spreader machines have the problems of clogging, accidental dumping, non-uniform distribution of varying quantities of spreaded materials and do not provide selective means whereby only a portion of the width of the spreader gate means may be used for spreading various materials as an all purpose and all weather spreader machine over rough and icy roads, ploughed ground and the like.

The new machine of this invention solves the above problems by providing selective means for blocking off any portion of the spreader gate having multiple discharge openings, providing adjustable spring bias means for the openings to vary the rate of distribution of spreaded material, and arcuate projections on a spreader drum of sufficient size to prevent clogging of materials used when the rate of spreading is substantially increased or decreased or a portion of the spreader drum is blocked off for small strip distribution for selective road repair.

It is a primary object of this invention to provide a spreader machine for aggregate materials which will provide a selective flow of aggregate on a road surface without clogging and reduce wear on the springs coacting with a multiple of discharge door means.

Another object of this invention is to provide a new spreader machine for aggregate materials which will reliably function in all kinds of weather conditions and over rugged terrain.

A still further object of this invention is to provide a spreader machine for various aggregate materials which will save money, time and materials on substantially any spreading project.

Another object of this invention is to provide a new spreader machine which is adapted for selective narrow strip, patching or broad strip distribution for road repair.

Another object of this invention is to provide a new spreader machine which is adapted for distribution of corrosive materials, such as salt, calcium-chloride and the like without substantial corrosion or clogging of the springs or working parts of the machine.

A further object of the invention is to provide a new machine having a spreader trough with narrow and multiple discharge openings so arranged that when a large particle of material is discharged the entire width of the trough or a larger part of the same does not open to allow a considerable amount of material to be accidentally discharged.

A still further object of the invention is to provide a new spreader machine adapted to spread more than one strip of aggregate material simultaneously while in transit.

Other objects and features of the invention will become apparent to those skilled in the art as will be more particularly pointed out and understood by reference to the following detailed description when considered in connection with the accompanying drawings in which like reference numerals designate like parts throughout the figures thereof and wherein:

FIGURE 1 is a side elevational view of the preferred embodiment of the new machine as seen attached to the tilted body of a dump truck and the like for spreading an aggregate material while in transit;

FIGURE 2 is a rear view of the new machine as seen on lines 2—2 of FIGURE 1 looking in the direction of the arrows;

FIGURE 3 is an enlarged fragmentary sectional view of FIGURE 2 taken on lines 3—3 looking in the direction of the arrows;

FIGURE 4 discloses an enlarged partial sectional side view of the spreader looking from the opposite end as FIG. 1;

FIGURE 5 is an enlarged partial rear view of a second embodiment of the invention employing leaf spring bias means for the door of each multiple discharge opening of the spreader;

FIGURE 6 is a sectional view of FIG. 5 taken on lines 6—6 looking in the direction of the arrows;

FIGURE 7 is an enlarged partial rear view of a third embodiment of the invention in which a torque spring means is employed in connection with the hinge of each multiple discharge door of the spreader;

FIGURE 8 is a sectional view of FIG. 7 taken on lines 8—8 looking in the direction of the arrows;

FIGURE 9 is an enlarged partial rear view of a fourth embodiment of the invention in which the bias spring for the door of each multiple discharge opening of the spreader is incorporated in each hinge of the multiple doors; and
 FIGURE 10 is a sectional view of FIG. 9 taken on lines 9—9 looking in the direction of the arrows.

Referring to the drawings, wherein like reference numerals designate like parts, FIGURES 1, 2, 3, and 4 are an exemplary embodiment of the invention attached to the body of a dump truck 15 and open tail gate 15a by coupling means 16, coacting coupling 18 and pin means 17. Tail gate means 15a may be fitted with bulkhead end plates to prevent material leaking out of the sector opening formed by the body, and the tail gate 15a.

The spreader box 20 is tilted relative to the dump body 15 in order to allow the tail gate 15a to swing away from the dump body 15 to just miss the spreader box 20, but to also be close enough to it to accomplish a seal or loss of material out of the back. This ability of the tail gate 15a to miss and swing wide open is to allow dumping clear over the spreader 20 which is sometimes desired.

Spreader means 20 comprises, in general, service housing 26, spreader drum 22, driven by sprocket means 25 and 41 and chain means 42 connected to a hydraulic motor, combustion engine, or other power means (not shown); hopper means 21, gate means 29 connected to biased spring means 35 by lever means 27 and shaft means 31.

Hopper means 21 may be varied as to shape as desired and consists of trough means 20a, lip means 20b, and end plates 45. Each hopper of each embodiment of the invention has a discharge opening 37 which is selectively closed by multiple door or gate means 29 biased as desired by spring means 35 in association with lever means 27, spring keeper means 27a and arcuate catch means 28 and notch means 28a. Rod means 38 and nut means 39 are suitably mounted in bearings 38a of FIG. 3 whereby rod means 38 is a selective adjusting means for various modes of operation of multiple door means 29 hinged on shaft means 30, as shown.

A bar 40 will be furnished in various sets of widths. The bar will have holes to receive rods 38. For example, two rods 38 could hold in place a bar with a 24" length and thus prevent spread for this width.

Spreader drum means 22 mounted on shaft 24 and in suitable end bearings is unique in that it carries small longitudinal projections 23 having an arcuate cross section as shown attached by their longitudinal axis to drum means 22 in staggered positions, which permits discharge of varying quantities of materials from substantially full

discharge to substantially zero discharge of materials. In use, the wiping or cleaning action of drum projections 23 with spring biased door means 29 prevents materials from becoming clogged in spreader 20 during its varied use.

During use, spreader 20 is controlled for quantity of discharged material by tightening or lessening the amount of compression on springs 35 by lever means 27 and locked in position by keeper means 27a coacting with arcuate catch notch means 28a, during which rod means 33 freely reciprocates in crank bar means 32. Rod means 33 is hingedly connected by hinge means 34 and screw or bolt means 36 to each multiple door means 29, as shown.

Of course, the quantity of material discharged by the spreader may also be varied by the rotary speed of the spreader drum per unit of road travel by the dump truck 15. The positioning of spring means 35 behind door means 29 is novel in several ways, in that such an arrangement will permit a large article of aggregate to pass through the discharge gate means 29 of spreader 20 without substantially accidental discharging of large amounts of material. Also, the springs 35 are protected from corrosive materials such as chemicals, salts and the like by being so positioned behind door means 29 so as to not contact such materials while they are being discharged. Furthermore, if desired, door means 29 may be selectively and substantially blocked by bar 40, rod means 38, and nut means 39 of FIG. 3 or by proper insert means in hopper opening 37, as desired. Such adjustment of rod means 38 is advantageous in spreading aggregate material in strip form during road repair or the distribution of salts or the like on the crown of an icy road surface during inclement weather. The purpose of this technique is to get the salt to completely penetrate through to the bottom of a rather thick ice accumulation whereupon the salt water resulting would then flow both directions on the cross surface of the road undermining the ice and loosening it from the road. Continued traffic would then tend to break up the ice thus loosened from the road or a snow plow could be used for this purpose.

In FIGS. 1 and 3, housing means 44 protectively encloses sprocket chain 42, pinion sprocket 25 and driven sprocket 41, by being secured to the hopper structure 21 by bolt means 43. Hopper means 21 is attached to coupling means 18 by bolt means 19. Coupling means 18 is connected to truck coupling means 16 by pin means 17. Coupling means 16 is connected to the dump truck bed 15 by bolt means 16a as shown.

FIGURE 4 shows an end view of spreader means 20, coupling means comprising coupling members 16, coacting coupling means 18 secured to hopper means 21 by bolt means. Coupling means 16 and 18 are interconnected by pin means 17. Housing means 44 protectively covers sprocket means 25 and 41 and chain means 42. Housing means 44 is secured to end plate means 45 by bolt means 43. Sprockets 25 and 41 may be of any relative sprocket ratio, as desired. Bearings and mountings for sprockets 25 and 41, may be of any desired conventional design.

FIGS. 5 and 6 are a second embodiment of the invention in which leaf spring means 49 are applied to the back surfaces of the multiple doors 29 to control the quantity of materials discharged per unit of time or distance of travel of dump truck 15. Spring means 49 is secured by bolt means 47 to shaft means 46 in bearing means 47a in FIG. 6, as shown. Various pressures may be applied, as desired, to springs 49 by a lever and keeper means as in FIG. 1 to regulate the space or pressure between multiple door means 29 and spreader drum 22 for a desired rate of discharge of aggregate materials from spreader 20. The operation of spreader drum 22 for FIGS. 5 and 6 is substantially the same as described in FIGS. 1, 2, 3, and 4.

FIGS. 7 and 8 illustrate a third embodiment of the

invention in which torsion springs 48 are mounted by bolt means 47 to shaft and bar like means 46 in suitable end bearings 47a as in FIGS. 5 and 6. Shaft means 46 is controlled by a lever and keeper means as in FIG. 1.

The coaction of spring means 48 with the bottom portion of multiple door means 29 permit a more positive action of spring means 48 with multiple door means 29 when handling very heavy aggregate of materials which are to be selectively discharged or spread on a road or terrain surface. Door means 29 is secured by hinge means 29a to shaft means 31 supported in suitable end bearings 30a as desired. Spreader hopper means 21 consists of trough means 20a and back lip means 20b, as shown. Spreader drum 22 has spreader surface projections 23 as in FIGS. 1, 2, 3, 4, 5, and 6.

FIGURES 9 and 10 disclose a fourth embodiment of the invention in which torsion spring means 35a are formed as part of the hinge structure 29b of door 29 about shaft member 21 which may be controlled for tension against multiple door means 29 by a lever and keeper similar to lever 27 and keeper 27a of FIG. 1. Torsion spring means 35 is secured to rod means 31 by an eye 35b on the end of the spring loop being engaged on a pin 35c carried by a transverse aperture means 31a. Spring means 35 is a torsion spring means similar to the conventional screen door type and has a terminal end 35a biased for coaction with discharge doors 29 which may be applied selectively through shaft means 31 by a lever means 27 and keeper 27a as used in FIG. 1.

FIGURE 10 discloses a partial rear view of FIG. 9 showing the relationship of hinge means 29b to spring means 35a and shaft means 31. Shaft means 31 is supported in any conventional end bearing means 30a as in FIG. 8. In FIGS. 9 and 10 the spreader 20 functions as described for FIG. 1 in relation to spreader drum 22, staggered arcuate projections 23 and multiple door means 29 for a desired torsion force on spring means 35a by a lever 27 and spring biased keeper 27a as in FIG. 1.

The spreader drum of the various modifications of FIGS. 5, 7, and 9 is propelled by chain and sprocket means connected to a motor (not shown) as disclosed in FIGS. 1, 3, and 4, or other conventional energizing means as desired.

In each modification of the invention projections 23 are uniquely staggered in position on spreader drum 22 so that projections 23 will not coact with all of multiple gate means 29 at the same time to give a more smooth and uniform spread of materials from hopper 21. The longitudinal length of projection 23 may be equal to or less than the width of gate means 29, depending upon the type of wiping action between members 23 and 29 desired.

Each modification of the invention employs a different type of spring and lever-like coaction with the multiple discharge door means 29 of spreader 20, depending upon price and the type of use intended of the spreader. For example, if the spreader is used for heavy aggregates and hard road use, the modifications of FIGS. 1 and 5 may be used, while the modifications of FIGS. 7 and 9 may be used for occasional or less rugged use, if desired. Also, some customers prefer one type of spring action over others for the maintenance of their spreaders.

Operation

Each of the four embodiments of this invention operates in a general and similar manner, purposely, so that an operator does not have to have a new acquired skill for operation of each embodiment of the invention. For operation, the following steps may be taken:

The inventive hopper spreader is attached by coupling means 16 to coacting coupling means 18 by pin means 17, after which shaft 25a is energized by conventional gear or other means which are energized by a motor, power take-off of the truck drive or prime mover, as desired. The material to be spread is supplied from the inclined

5

body of the dump truck to spreader 20. Then the spring coaction with multiple door means 29 is regulated by lever means 27 and set by spring actuated keeper means 27a to a desired notch 28a in arcuate catch means 28 as desired.

For selective strip operation certain of the multiple door means 29 may be substantially blocked off by adjustment of rod means 28, bar means 40, and nut means 39; by inserts (not shown) to selectively cover a part of opening 37 of hopper means 21, or other desired conventional means. In this new machine it is found that the amount of spring pressure on the multiple door means 29 against spreader drum means 22 gives a wide control of the materials spread. For example, a tight setting of springs 35 and 35a would give a nice, fine, even spread of materials, and a loose setting of these springs would allow a good quantity of material to flow through the spreader.

It is to be understood, of course, that the foregoing disclosure relates to the embodiments of the invention as illustrated, but that various modifications and changes may be made in the invention by those skilled in the art without departing from the spirit and scope of the invention as set forth in the appended claims.

I claim:

1. A materials spreader comprising a transversely elongated hopper including end plates, supplemental plates secured to said end plates and adapted to secure said hopper to the rear of a dump truck, said hopper also including an open top adapted to be positioned in alignment with the bottom of the dump truck, a downwardly and rearwardly inclined baffle in said hopper, a transverse spreader drum rotatable in said hopper with the bottom of said baffle overlying the top of said drum, spaced staggered protuberances on the surface of said drum, a drive gear for said drum at one end thereof, a drive sprocket adjacent said gear, a chain connection between said gear and said sprocket, power means for driving said sprocket, a shaft extending across the rear upper

6

edge of said hopper between said end plates, a plurality of individual gates pivoted on said shaft and depending to a point adjacent the rear center portion of said drum, said baffle, drum and gates normally completely closing the open bottom and rear of said hopper, individual spring means biasing each gate toward engagement with said drum, means for varying the force exerted by said spring means, and means limiting the pivotal movement of certain of said gates against the bias of said springs, to hold selected ones of said gates completely closed.

2. The structure of claim 1 wherein said spring means comprises a rod pivoted to the rear of each gate, a spring surrounding each rod, an apertured transverse bar through which each rod extends, said bar serving to compress said springs.

3. The structure of claim 2 wherein the means for varying the force exerted by said spring means comprises an operating handle connected to said transverse bar for varying the relative position thereof, and means for locking said handle in a selected position of adjustment.

4. The structure of claim 3 wherein the means for limiting the pivotal movement of said gates comprises a second transverse bar, having openings therein, additional rods extending through said opening and pivoted in said hopper and clamping nuts threaded on the threaded extending ends of said additional rods.

References Cited by the Examiner

UNITED STATES PATENTS

30	1,489,739	4/1924	Chisholm	222—213
	1,606,676	11/1926	Urann	275—2A 16
	1,885,319	11/1932	Baumgardner	275—2
	2,777,700	1/1957	Valantin	275—2
35	3,000,641	9/1961	Walborn	275—2

ABRAHAM G. STONE, *Primary Examiner*.

WILLIAM A. SMITH III, *Examiner*.