

April 8, 1958

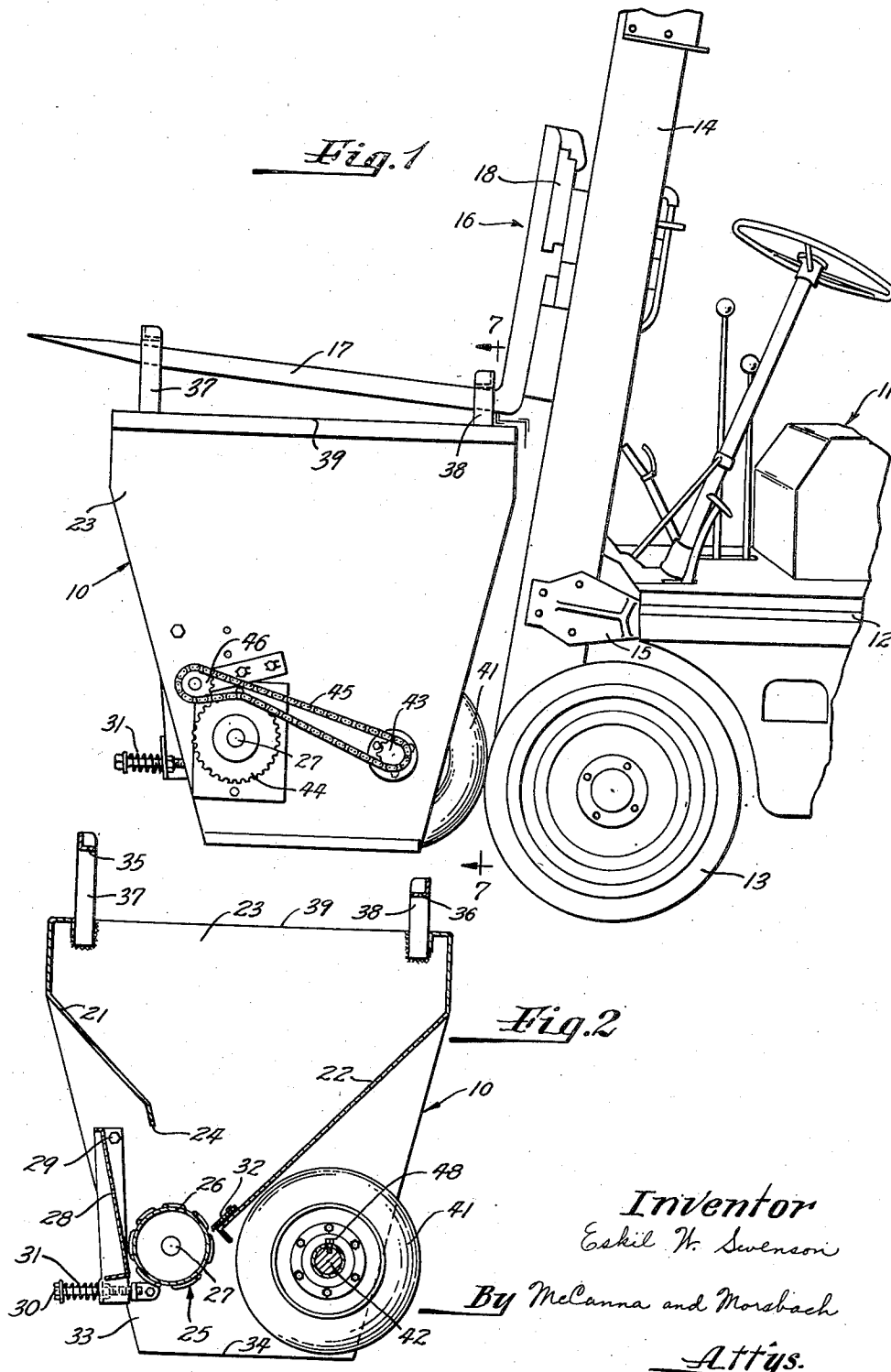
E. W. SWENSON

2,829,896

SPREADER ATTACHMENT FOR FORK LIFT TRUCK

Filed Nov. 19, 1954

2 Sheets-Sheet 1



Inventor
Eskil W. Swenson

By McCanna and Morsbach

Attys.

April 8, 1958

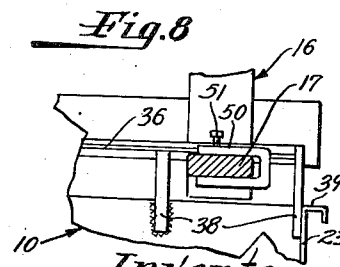
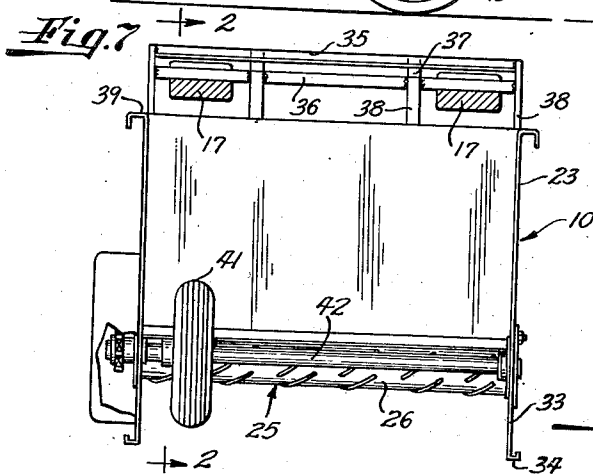
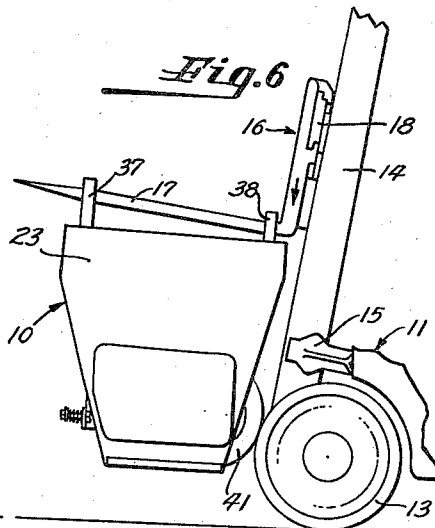
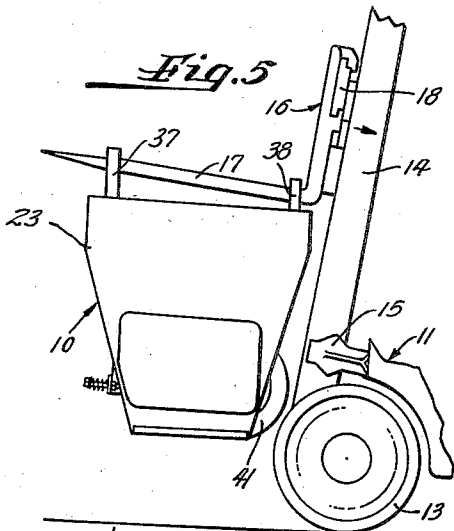
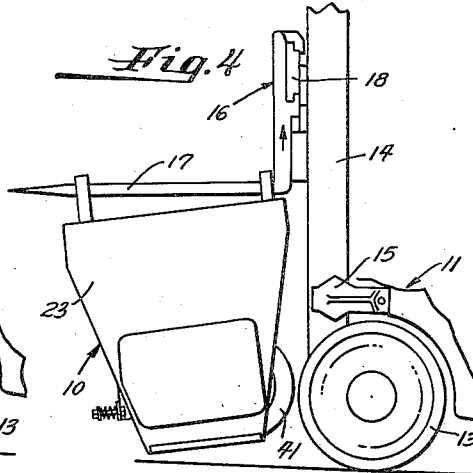
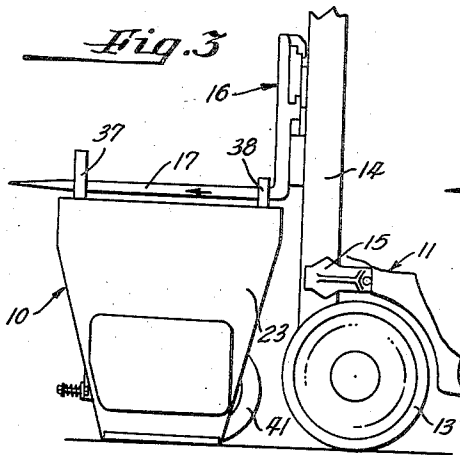
E. W. SWENSON

2,829,896

SPREADER ATTACHMENT FOR FORK LIFT TRUCK

Filed Nov. 19, 1954

2 Sheets-Sheet 2



Inventor
Eskil W. Swenson
By Melanna and Morsbach
Attys.

1

2,829,896

SPREADER ATTACHMENT FOR FORK LIFT TRUCK

Eskil W. Swenson, Cherry Valley, Ill.

Application November 19, 1954, Serial No. 470,077

6 Claims. (Cl. 275—2)

This invention relates to spreaders and more particularly to a spreader attachment for a fork lift truck.

An important object of this invention is the provision of a material spreader arranged to be carried by a vehicle and which can be attached to and detached from the vehicle without having to manually handle the spreader attachment.

Another object of this invention is the provision of a spreader attachment for a fork lift truck which is arranged to be elevated by the fork lift structure on the truck and the spreader feed mechanism driven from the ground engaging wheels of the truck when the attachment is in its raised position so that the truck may be easily turned and maneuvered during the spreading operation.

A further object of this invention is the provision of a spreader attachment for a fork lift truck in which the lift structure of the truck is operable to effect connection and disconnection of the drive for the spreader feed mechanism.

Yet another object of this invention is the provision of a spreader attachment for a fork lift truck which is arranged to support itself in an upright position ready to be picked up by the lift structure on the truck and transported thereby and which will compactly store a large quantity of material to be spread whereby the spreader attachment may be positioned at a convenient location ready for use when needed.

A still further object of this invention is the provision of a spreader attachment for a fork lift truck having hooks at the upper end thereof arranged to support the spreader attachment on the fork of the lift truck in driving engagement with the ground engaging wheels of the truck when the lift structure is raised and tilted rearwardly of the truck whereby the forks are inclined upwardly and forwardly to thereby maintain the spreader in proper position on the lift structure and in engagement with the ground engaging wheels by gravity.

These, together with various ancillary objects and advantages of this invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description when taken in connection with the accompanying drawings wherein:

Figure 1 is a fragmentary side elevational view of a lift truck having the spreader attachment mounted thereon;

Fig. 2 is a vertical sectional view through the spreader taken on the plane 2—2 of Fig. 7;

Fig. 3 is a fragmentary side elevational view of the lift truck and spreader illustrating the spreader attachment in its storage position and the lift truck in an approach movement thereto preparatory to picking up the spreader attachment;

Fig. 4 is a fragmentary side elevational view of the lift truck and spreader attachment illustrating the spreader attachment being raised by the lift structure on the truck;

Fig. 5 is a fragmentary side elevational view of the

2

lift truck and spreader attachment showing the spreader attachment in its transport position;

Fig. 6 is a fragmentary side elevational view of the lift truck and spreader attachment showing the spreader attachment in its spreading position;

Fig. 7 is a fragmentary vertical sectional view through the lift truck and spreader attachment taken on the plane 7—7 of Fig. 1; and

Fig. 8 is a fragmentary sectional view through the forks on the lift truck with the spreader attachment mounted thereon and showing a clamp for retaining the spreader attachment in position on the lift structure.

The spreader attachment indicated generally by the numeral 10 is arranged for use with a fork lift truck 11, of conventional construction, to be picked up and transported by the truck all without the necessity of manually handling the spreader.

The lift truck may be of any of various different constructions presently being manufactured, and which is general, include a body 12 having forward ground engaging wheel 13 and an upright frame 14 pivotally connected to the body adjacent the forward end thereof for tilting movement about an axis transverse the body forward and aft of the truck. The position of the frame 14 relative to the vehicle may be adjusted in any desired manner and as illustrated in the drawings includes a bracket 15 connected to the hydraulic ram of an hydraulically controlled apparatus, which apparatus is selectively operable to tilt the frame forwardly and rearwardly of the vehicle. A fork lift structure 16 is vertically movably mounted on the frame and is raised and lowered thereon, as by an hydraulically controlled apparatus (not shown). The fork lift structure is arranged to use a plurality of different instrumentalities, one of which includes a pair of forks 17 which are attached to the fork lift structure for movement therewith and project forwardly of the frame at substantially right angles thereto. In the type of lift truck illustrated, the forks 17 are adjustable laterally of the vehicle on the ways 18.

The spreader attachment 10 comprises a hopper having a front wall 21 and a rear end wall 22 and opposed side walls 23 secured to the front and rear end walls. As best shown in Fig. 2, the lower end 24 of the front wall 21 terminates above the lower end of the rear wall and a plate 28, which forms a continuation of the front wall, has the upper end thereof hingedly connected to the side walls 23 by pins 29. The plate 28 is spaced from the lower edge of the rear wall to provide an opening therebetween and a feed mechanism 25 is located at the opening for dispensing the material at a controlled rate from the hopper. The feed mechanism may be of any conventional construction and as shown in the drawings includes a rotary feed member 26 supported on a shaft 27 which is journaled at its opposite ends in the opposed side walls 23. The plate 28 extends alongside the feed member 26 and is adjustable towards and away therefrom by means of the adjusting bolt 30 to vary the amount of material dispensed, a spring 31 being provided to yieldably retain the plate in its adjusted position. The feed member is arranged for rotation in a counterclockwise direction as viewed in Fig. 2 to thereby dispense material from the hopper between the feed member and the plate 28 at a rate determined by the spacing therebetween and a plate 32 is adjustably mounted on the lower end of the rear wall and arranged to extend closely adjacent to the periphery of the feed member 26 to prevent passage of material therebetween.

The spreader attachment is intended for use in distributing material such as sand, salt, saw dust and the like over sidewalks and area ways in and about factories, and the size of the hopper is made such as to store a

3 relatively large quantity of this material sufficient to permit covering of a large area so as to thereby obviate the necessity of providing a separate device for storing the material to be dispensed by the spreader. The spreader attachment is made self-supporting when not in use and for this purpose the opposed side walls 23 are provided with lower end portions 33 which extend below the front and rear end walls of the hopper and have flat lower ends 34 preferably formed with a reinforcing channel to support the spreader in an upright position on a supporting surface. The spreader may thus be positioned at any convenient location in or about a factory or the like and filled with a suitable material to be dispensed so that the spreader is at all times ready for use when needed.

In order to attach the spreader to the lift truck, a pair of bars 35 and 36 are attached to the hopper at the upper end thereof adjacent the front and rear end walls 21 and 22 respectively by means of straps 37 and 38 to provide hooks for engagement with the fork lift structure of the truck. The bars 35 and 36 extend crosswise of the hopper parallel to the front and end walls thereof and are spaced above the upper end 39 of the hopper to permit the forks 17 of the lift structure to be inserted therebelow when the lift truck is advanced onto the hopper from the rear end thereof, as shown in Fig. 3. As best shown in Fig. 7, the straps 37 and 38, which respectively connect the several bars 35 and 36 to the hopper, are spaced apart a distance relatively greater than the width of the forks 17 and are arranged to engage opposite sides thereof to limit movement of the spreader laterally of the lift truck. For reasons set forth more fully hereinafter, the bar 35 is spaced relatively further above the upper end 39 of the hopper than is the bar 36.

Provision is made for driving the feed mechanism 25 at a rate correlated with the advance of the spreader and for this purpose there is provided a roller 41 which is disposed on a shaft 42 journaled in the depending portions 33 of the opposing side walls 23. One end of the shaft 42 extends through the side wall and is drivingly connected to the shaft 27 of the feed member 26. As best shown in Fig. 1 a sprocket 43 is provided on the projecting end of the shaft 42 and a sprocket 44 attached to the end of the feed member shaft 27, a chain 45 being provided to operatively connect the sprockets 43 and 44. An adjustable idler sprocket 46 is provided for adjusting the tension on the chain.

The roller may be arranged to extend below the lower ends 34 of the side walls and engage the ground as the lift truck is advanced to operate the feed mechanism at a rate correlated with the advance of the spreader. However, in order to facilitate turning and maneuvering of the lift truck, when the spreader is mounted thereon, the roller 41 is preferably arranged so as to be out of contact with the ground when the spreader is in its spreading position shown in Fig. 6. The roller is accordingly located above the lower end 34 of the side walls, so as to not contact the ground when the spreader is in its storage position, and arranged to project rearwardly from the spreader for engagement with the forward ground engaging wheel 13 on the lift truck 11 to be driven thereby as the truck is advanced. As best shown in Fig. 2 the roller is non-rotatably attached to the shaft 42 and is adjustable therealong by means of a set screw 48 to adapt the spreader for use with different types of lift trucks having different spacing between the front ground engaging wheels.

In accordance with the present invention, the spreader attachment is so arranged that when the upwardly extending frame 14 is disposed substantially vertically and the fork lift structure 16 moved upwardly therealong to raise the spreader, the roller 41 is spaced forwardly of the ground engaging wheel and does not contact the

same. When the frame 14 is tilted rearwardly of the vehicle, and the fork lift structure lowered, the roller then moves into engagement with the ground engaging wheel 13 of the truck to effect driving of the spreader feed mechanism. When it is desired to interrupt the feeding from the spreader, it is only necessary to either elevate the fork lift structure, or alternatively, pivot the frame 14 forwardly to effect disengagement of the roller from the ground engaging wheel. This arrangement, by which the roller does not engage the ground engaging wheel until the frame is tilted rearwardly, is advantageous in that the forks 17, which extend substantially perpendicular to the frame 14, are inclined forwardly and upwardly when the frame is tilted rearwardly and consequently, the spreader will be maintained by gravity in position on the forks adjacent the frame 14. In normal use it is, therefore, unnecessary to provide a separate apparatus for locking the spreader in position on the fork structure. However, in the event it is desired to operate the spreader on steep ramps and the like, a suitable clamp such as the C-clamp 50 shown in Fig. 8 may be provided. The C-clamp is detachably secured to the lift truck forks 17, as by the set screw 51, and arranged to engage the rear bar 36 of the spreader attachment to thereby prevent the spreader attachment from slipping off the fork lift structure when the truck descends a steep incline.

From the foregoing it is thought that the operation of the spreader will be readily understood. Briefly, the spreader is arranged to support itself in an upright position on a supporting surface, as shown in Fig. 3, and the hopper is formed with a sufficiently large capacity to hold a large quantity of the material to be spread. When it is desired to use the spreader, the fork lift truck 11 is maneuvered, as shown in Fig. 3, to advance toward the spreader attachment from the rear thereof to insert the forks 17 through the hooks formed between bars 35 and 36 and the attaching straps 37 and 38. The fork lift structure is then elevated, with the frame 14 in an upright position, to lift the spreader attachment off the supporting surface. As shown in Figure 4, the spreader attachment swings downwardly relative to the fork 17 about the rear bar 36, as the attachment is raised, until the forward bar 35 engages the fork. The forward bar thus defines a stop for limiting downward pivotal movement of the spreader attachment relative to the fork. Thereafter, the frame 14 is tilted rearwardly, as shown in Fig. 5, so that the fork 17 is inclined forwardly and upwardly to thereby maintain the spreader attachment on the fork lift structure by gravity. Since the spreader is raised above the supporting surface and does not contact the same, the lift truck with the spreader attached may be readily turned and maneuvered. As best shown in Figs. 5 and 6, the bars 35 and 36 are spaced different heights above the upper edge 39 of the spreader so that when the frame is tilted rearwardly and the forks 17 inclined upwardly, the spreader is supported in a substantially horizontal position.

When it is desired to dispense material from the hopper, the fork lift structure is lowered as shown in Fig. 6 to position the roller 41 in engagement with the ground engaging wheel 13 of the truck. Preferably, the lift structure is lowered to a position such that the pressure applied by the ground engaging wheel against the roller tends to pivot the spreader in a clockwise direction, as viewed in Fig. 6 so that the forward bar 35 is spaced slightly above the forks 17 whereby the weight of the hopper and the material contained therein urges the roller 41 into driving engagement with the ground engaging wheel 13. Since the roller 41 does not engage the ground it is apparent that the truck and spreader may also be readily maneuvered while spreading material.

After the spreading operation has been completed, the lift truck is maneuvered to the position from which

5

the spreader was removed and the lift structure lowered to discharge the spreader from the truck. In this manner, attachment and detachment of the spreader from the lift truck may be effected without requiring any manual handling of the spreader.

It is also to be noted that the spreader is located in front of the truck and spreads material in advance of the truck. Moreover, since the spreader is carried by the truck, the weight of the spreader and the material in the spreader increases the pressure applied to the forward drive wheels and materially improves the traction of the lift truck.

I claim:

1. In combination with a lift truck having a forward ground engaging wheel, an upwardly extending frame mounted on said truck for fore and aft tilting movement, and a lift structure vertically movably mounted on said frame and including a fork extending forwardly thereof, a spreader attachment comprising a hopper having front and rear end walls and side walls secured to said end walls, legs on said hopper for supporting the latter in an upright position when not in use, front and rear hooks on the upper end of said hopper adjacent the front and rear walls thereof for receiving the fork of the lift structure when the truck is advanced toward the rear wall of the hopper, said hooks supporting the hopper on the fork when the latter is raised, said front hook loosely receiving said fork to permit limited relative vertical movement therebetween, said hopper having a discharge opening therein, a feed member located at said opening for dispensing material from the hopper, a roller mounted on said hopper and arranged to engage said forward ground engaging wheel when the lift structure is raised and the frame is tilted aft of the truck, and means operatively connecting the roller to the feed member to drive the latter.

2. The combination of claim 1 wherein the hook adjacent the front wall of the hopper projects relatively farther above the hopper than the hook adjacent the rear wall thereof whereby the hopper is supported in a horizontal position when the frame is tilted rearwardly of the vehicle and the fork extends forwardly and upwardly.

3. In combination with a fork lift truck having a forward ground engaging wheel, a frame tiltable vertically fore and aft of the truck and a fork lift structure mounted on the frame for movement therealong and including a fork extending transversely to the frame and forwardly thereof, a spreader attachment comprising, a hopper having front and rear end walls having a dispensing opening therebetween and opposed side walls secured to the end walls, hooks attached to the upper end of said hopper and extending thereabove crosswise of the hopper adjacent the front and rear walls thereof for receiving the fork on the lift structure to support the hopper thereon when the lift structure is raised, the hooks adjacent the front wall of the hopper extending relatively farther above the upper end thereof than the hooks adjacent the rear wall of the hopper whereby said hopper is supported horizontally when the frame member is tilted aft of the vehicle and the fork is inclined forwardly and upwardly, and a roller mounted on said hopper to engage one of the ground engaging wheels on the truck when the frame member is tilted aft and the lift structure is raised to a preselected position, and means located at said opening for dispensing material from the hopper.

4. The combination of claim 3 including depending legs on said hopper extending below said roller for supporting the hopper in an upright position when not in use.

5. In combination with a fork lift truck having a forward ground engaging wheel, a frame mounted on the

6

truck for tilting movement fore and aft of the truck, and a fork lift structure mounted on said frame for movement therealong and including a fork extending transversely to said frame and forwardly thereof, a spreader attachment comprising, means defining a hopper having a dispensing opening therein, a rotatable member located at said opening for dispensing material from the hopper, hook means adjacent the upper rear portion of said hopper for receiving the fork on said lift structure to support the hopper thereon for limited vertical pivotal movement relative to the fork, means adjacent the upper forward portion of said hopper defining a stop engageable with said fork to limit downward pivotal movement of the hopper relative to the fork, said hook means and stop being arranged to support said hopper when said frame is disposed in a vertical position and said lift structure is raised, a roller mounted on said hopper and positioned to engage said ground engaging wheel when said frame is tilted aft of said truck whereby to pivot said hopper about said hook means and move said stop away from said fork and thereby yieldably maintain said roller in engagement with said ground engaging wheel under the weight of said hopper and the material contained therein, and means operatively connecting said roller to said rotatable member for driving the latter as said truck is advanced.

6. In combination with a fork lift truck having a forward ground engaging wheel, a frame mounted on the truck for tilting movement fore and aft of the truck, and a fork lift structure mounted on the frame for movement therealong and including a fork extending transversely to said frame and forwardly thereof, a spreader attachment comprising a hopper having front and rear end walls and having a discharge opening therebetween, side walls secured to said end walls and extending therebelow to provide support legs for supporting the hopper in an upright position, a rotary feed member located at said opening for dispensing material, hook means adjacent the upper rear portion of said hopper for receiving the fork on said lift structure to support the hopper thereon for limited vertical pivotal movement relative to the fork, means adjacent the upper forward portion of said hopper defining a stop engageable with said fork to limit downward pivotal movement of the hopper relative to the fork, said hook means and stop being arranged to support said hopper when said frame is disposed in a vertical position and said lift structure is raised, a roller mounted on said hopper and positioned to engage said ground engaging wheel when said frame is tilted aft of said truck whereby to pivot said hopper about said hook means and move said stop away from said fork and thereby yieldably maintain said roller in engagement with said ground engaging wheel under the weight of said hopper and the material contained therein, and means operatively connecting said roller to said rotatable member for driving the latter as said truck is advanced.

References Cited in the file of this patent

UNITED STATES PATENTS

805,010	Fullilove	Nov. 21, 1905
1,606,949	Litchfield	Nov. 16, 1926
1,723,805	Nickerson	Aug. 6, 1929
2,413,661	Stokes	Dec. 31, 1946
2,431,589	Shuler	Nov. 25, 1947
2,508,345	Hardz et al.	May 16, 1950
2,696,317	Toffolon	Dec. 7, 1954
2,709,269	Williams	May 31, 1955
2,792,970	Gaiman	Mar. 21, 1957

FOREIGN PATENTS

644,710	Great Britain	Oct. 18, 1950
---------	---------------	---------------