Dec. 20, 1960 H. LOTZ 2,964,862

ANTI-SPILL ATTACHMENT FOR MATERIAL MOVING BLADE

Filed March 7, 1960

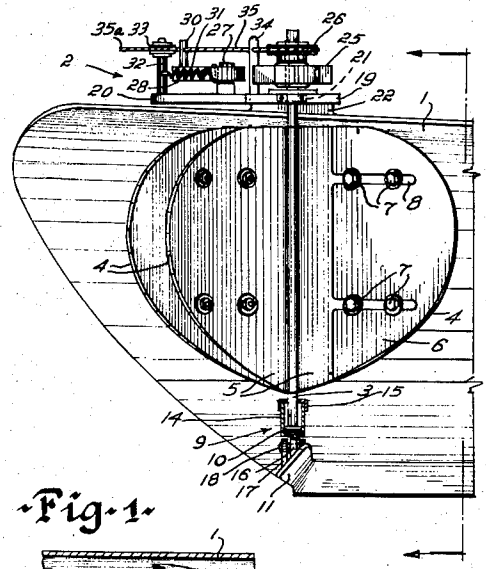

Fig. 1.

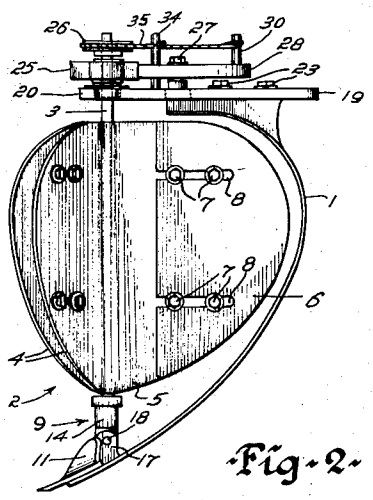

Fig. 2.

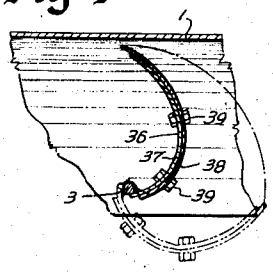

Fig. 5.

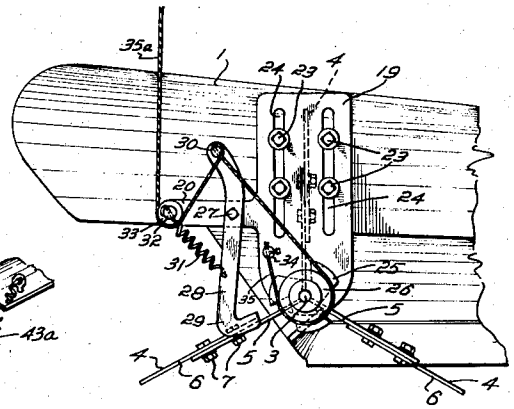

Fig. 3.

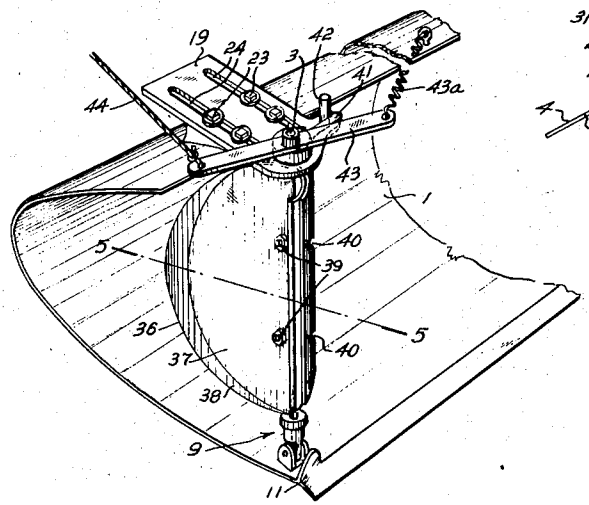

Fig. 4.

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ANTI-SPILL ATTACHMENT FOR MATERIAL MOVING BLADE

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This invention relates to attachments for material moving blades such as are employed in earth and and snow moving plows and the like.

In the use of material moving blades the end spill is frequently undesirable and creates a problem. For example, in the use of conventional snow plows on streets, roads and sidewalks, the end spill at crosswalks, driveways and the like creates a snow bank which blocks such walks and driveways and must subsequently be removed. One type of attachment for preventing such end spill is disclosed and claimed in my prior Patent 2,763,943.

It is an object of the present invention to provide an attachment for conventional material moving blades which may be employed to prevent end spill during any desired portion of travel of the blade whereby no bank of material created by the blade occurs at such portions of travel.

A further object is to provide such an attachment which may be freely and accurately operated with little effort.

The invention will be described with reference to the accompanying drawings in which

Figure 1 is a front elevation, partly in section, showing one type of attachment mounted on a material moving blade according to the present invention,

Figure 2 is an end elevation of the embodiment of Figure 1,

Figure 3 is a plan view of the embodiment of Figure 1,

Figure 4 is a persepctive view of another type of attachment mounted on a material moving blade, and

Figure 5 is a section through line 5—5 of Figure 4.

In the drawing, 1 is a material moving blade of conventional form.

The attachment illustrated in Figures 1, 2 and 3, is generally indicated at 2 and comprises a shaft 3 and a plurality (three as shown) of anti-spill blades 4 complementarily shaped to substantially fit the contour of the blade 1 and fastened to the shaft 3 approximately 120° apart. Each anti-spill blade 4 comprises a fixed plate 5 which is fastened longitudinally along the shaft 3 and an adjustable plate 6 which is adjustably fastened for substantially radial movement with respect to the shaft, to the plate 5 by bolts 7 in the slots 8 of the adjustable plate.

The shaft 3 is rotatably mounted on the forward face of blade 1 adjacent one end thereof. One end of shaft 3 is mounted near the bottom edge of the blade by means of a thrust bearing assembly generally indicated at 9. As shown in Figure 1, the shaft 3 extends from adjacent the top edge of the blade 1 to adjacent the bottom edge of the blade 1 and may be seated upon a ball bearing 10. The bearing 10 is seated in a cup 14 which may be filled with graphite or other lubricant. Cup 14 has a cap 15 through which shaft 3 extends and has a lower extension in the form of a lug 16. The cup 14 is rockably

mounted on the bottom edge of blade 1 by means of a bracket 17 which is fastened to the blade 1 near its bottom edge. As shown, lug 16 is pivoted in bracket 17 on pin 18 which passes therethrough and into bracket 17. A baffle 11 positioned on blade 1 in front of bracket 17 protects the rockable mounting from clogging.

Near the top edge of the blade 1, the other end of shaft 3 is rotatably mounted in supporting plate 19 by means such as ball bearing 21. The plate 19 is adjustably fixed to the top edge of the blade 1, and, as shown, sits on a boss 22 on the blade 1. Bolts 23 extend through slots 24 in the plate 19 into the boss 22.

Above plate 19 on shaft 3 a toothed wheel or gear 25 is fixedly positioned. The gear 25 has a tooth corresponding to each blade 4. Pulley 26 is fixed to the shaft above gear 25. Pivoted at 27 on externally extending arm 20 of plate 19 is a dog 28. Dog 28 has, at the forward end thereof, a hooked end 29 for engaging the teeth of gear 25 and a post 30 extending upward from the other end of the dog. A spring 31 is fixed at one end to dog 28 at a point between pivot point 27 and hooked end 29. The other end of spring 31 is fixed to a post 32 which is fixed to and extends upwardly from arm 20 of plate 19. Post 32 is provided with a pulley 33. An anchor post 34 is positioned beside the shaft 3 and extends upward from plate 19. A brake cable 35 is fixed at one end to post 34, passes around pulley 26, is fixed to post 30 on dog 27. A trip cable 35*a* is fixed to post 30, passes around pulley 33 and extends back to a position where it may be readily available to the driver of the vehicle on which the material moving blade is mounted.

Figures 4 and 5 show a single bladed attachment mounted on the material moving blade 1 in the same manner as the triple bladed attachment. The anti-spill blade 36 consists of a curved plate 37 longitudinal fastened to the shaft 3 and a curved or arcuately cross-sectioned adjustable plate 38 adjustably fastening to plate 37 by bolts 39 in the slots 40 of the curved plate 38. The curved plates 37 and 38 are so shaped as to fit complementarily into the blade 1 such that the convex side of the anti-spill blade forms with the blade 1 a substantially continuous surface for engaging the material to be moved. As before, the edge of the blade 36 conforms with the contour of the blade 1 and is rotatable with the shaft 3 to place such edge in closely fitting relation with the blade 1.

An arm 41 is fixed to shaft 3 above plate 19 for abutment with a stop pin 42 on plate 19. Above member 41 a bar 43 is fixedly mounted on the shaft 3 intermediate its ends. To one end of the bar, a spring 43*a* is fixed and to the other end a trip cable 44 is fastened. The spring 43*a* is attached at its other end to the top edge of the blade 1 at such an angle that it acts to bring the anti-spill blade 36 into closed position, as shown in Figures 4 and 5. The trip cable 44 is arranged to open the anti-spill blade against the action of spring 43*a* the position as shown in dotted lines in Figure 5.

The operation of both embodiments of the invention will be described in association with a snow plow. The adjustable plates 6 or 38 are adjusted to enlarge the spill blade by shifting the position of bolts 7 or 39.

The three bladed anti-spill attachment 2 being freely rotatable normally rotates under the impact of snow thereon and permits spillage of the snow over the end of blade 1. As the plow is passing a walk or driveway, the trip cable 35 is pulled causing dog 28 to pivot. The first action of this movement is to tighten the brake cable around pulley 33 thus decreasing the velocity of the spinning shaft 3 and, of course, the gear 25. The second action of the movement is to bring hooked end 29 into

engagement with a tooth of gear 25. This causes one of the spill blades to be locked in fitting relation with blade 1 to form a substantially continuous snow-retaining surface therewith. Upon release of the trip cable when the walk or drive is passed, spring 31 causes hooked end 29 of the dog 28 to move out of engagement with the gear tooth and the anti-spill blades begin again to spin under the impact of the snow.

The curved blade attachment is perhaps best adapted for a sidewalk plow although no limitation is intended by this statement. In operation, the spring 43*a* urges the anti-spill blade into fitting relation with blade 1. In this position, horizontal arm 43 rests against stop pin 42. Pulling of the trip cable 44 against the action of spring 43*a* and arm 43 causes the anti-spill blade to move into open position, as shown in dotted lines in Figure 5. The anti-spill blade, being curved, may be turned easily even when a mass of snow bears thereon. As previously indicated, in the closed or anti-spill position of the blade 36, its convex surface is disposed in substantially continuous relation to the major portion of blade 1. Thus, the convex surface and substantially arcuate shape of the anti-spill blade are such that as it is turned to open position, it need push aside very little snow. On release of the trip cable the spring brings the anti-spill blade back into fitting relation with the blade 1.

The advantages of the attachment described are readily apparent. Ease and accuracy of operation are obviously accomplished to a high degree. The provision of simply operated size adjustment of the anti-spill blade or blades better adapts the attachment to varying conditions of use.

I claim:

1. Anti-spill attachment for a material moving blade comprising a shaft rotatably mounted on one end of said material moving blade and extending from adjacent the bottom edge to adjacent the top edge of the material moving blade, an anti-spill blade fixed to said shaft, said anti-spill blade having an edge conforming with the contour of said material moving blade and being rotatable with said shaft to place said edge in closely fitting relation with said material moving blade, means locking said anti-spill blade in said closely fitting relation with the material moving blade to prevent spillage of material over said one end of the material moving blade, and means for releasing said locking means to permit rotation of said anti-spill blade and spillage of material over said one end of the material moving blade.

2. Anti-spill attachment for a material moving blade comprising a shaft rotatably mounted on said material moving blade and extending from adjacent the bottom edge to adjacent the top edge of the material moving blade, a plurality of anti-spill blades fixed to said shaft, each said anti-spill blade having an edge conforming with the contour of said material moving blade and being rotatable with said shaft to place said edge in closely fitting relation with said material moving blade.

3. Anti-spill attachment for a material moving blade as defined in claim 2, said anti-spill blades being three in number and positioned approximately 120° apart.

4. Anti-spill attachment for a material moving blade as defined in claim 2, including manually operable detent means for arresting rotation of said shaft and anti-spill blades in one of a plurality of positions, one of said anti-spill blades in each of said positions being disposed with its edge in closely fitting relation with said material moving blade.

5. Anti-spill attachment for a material moving blade as defined in claim 2, including means for braking rotation of said shaft, detent means for arresting rotation of said shaft and anti-spill blades in one of a plurality of positions, and manually operable means for successively actuating said braking means and said detent means, one of said anti-spill blades in each of said positions being disposed with its edge in closely fitting relation with said material moving blade.

6. Anti-spill attachment for a material moving blade as defined in claim 2, including means for locking one of said anti-spill blades into closely fitting relation with said material moving blade comprising a pulley and a gear fixed to said shaft, said gear having teeth complementary in number and position to said anti-spill blades, a dog carried by the top edge portion of said material moving blade and having a pivot intermediate its ends, one end of said dog being engageable with said teeth, a post mounted on the other end of said dog, a spring attached at one end to the top edge portion of said material moving blade and at the other end to said dog intermediate said pivot and tooth-engaging end, a brake cable having one end anchored with respect to said material moving blade and its other anchored to said post, the intermediate portion of said cable engaging said pulley, and a manually operable trip cable having one end anchored to said post.

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