Sept. 15, 1964 A. D. BATKO 3,148,466

ATTACHMENT FOR MATERIAL MOVING VEHICLES SUCH AS GRADERS AND THE LIKE

Filed Feb. 18, 1963 2 Sheets-Sheet 1

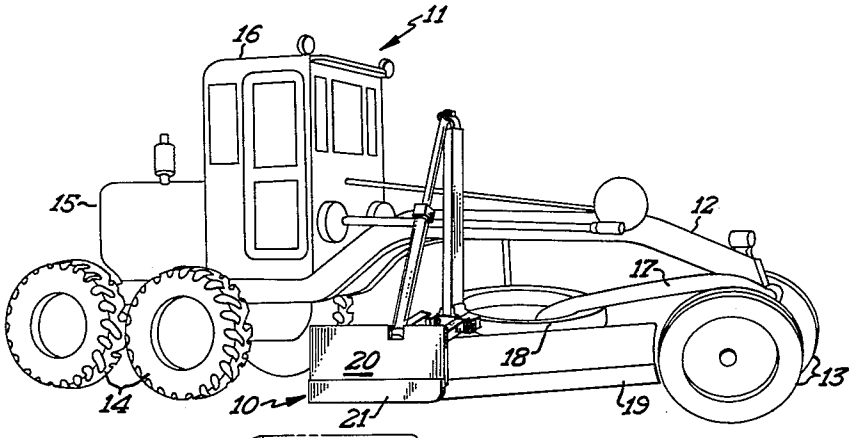


Fig 1

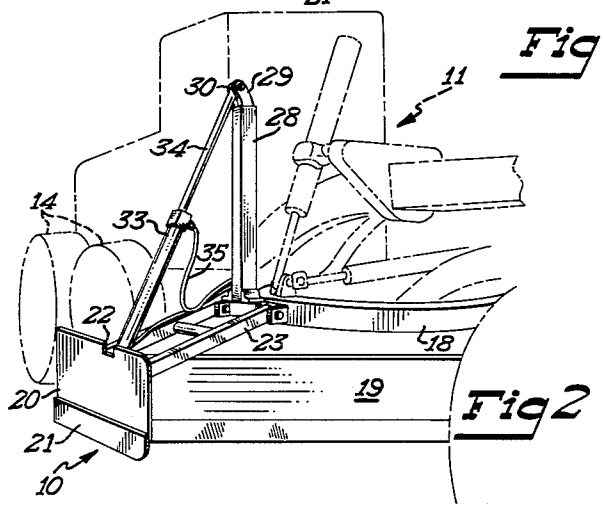


Fig 2

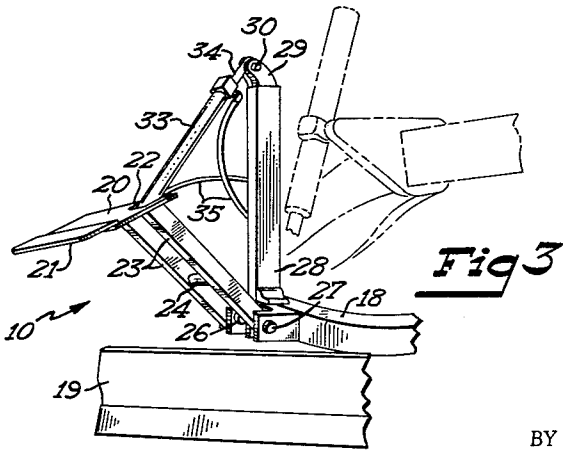


Fig 3

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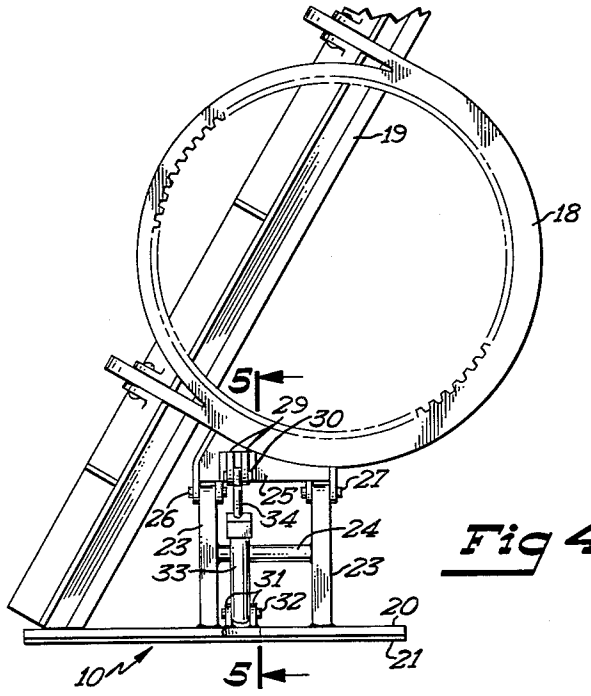


Fig 4

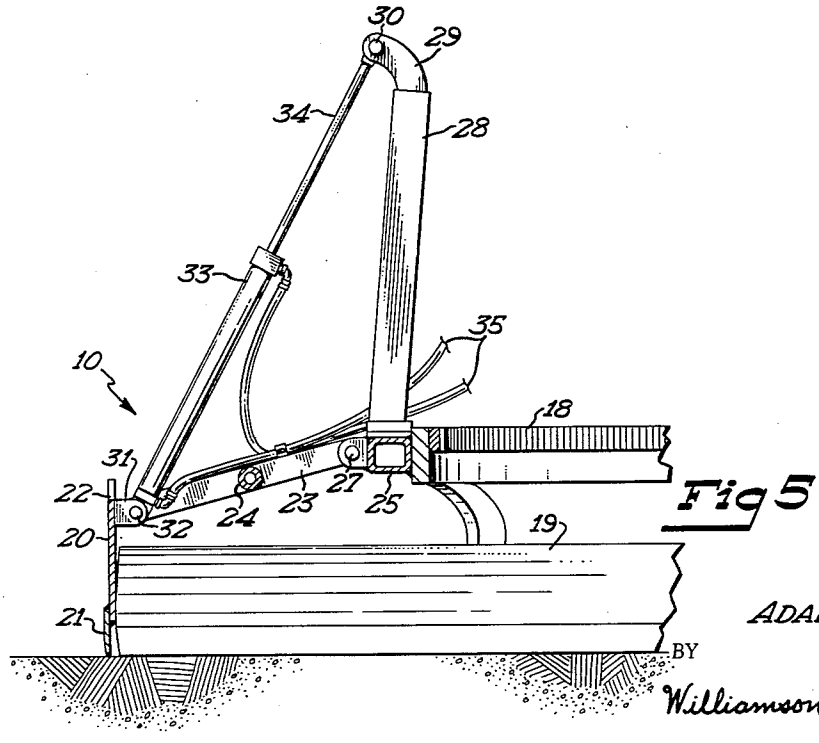


Fig 5

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ATTACHMENT FOR MATERIAL MOVING VEHICLES SUCH AS GRADERS AND THE LIKE

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This invention relates to vehicles or road machines having material moving blades such as graders and the like, and more particularly to an attachment for such vehicles to permit controlled lateral discharge of material by the material moving blade.

It has been found that during material moving operations such as snow removal, grading, surfacing and shouldering, it is sometimes desirable to accurately control the location at which the material is to be discharged by the material moving blade of the vehicle. Generally speaking, these types of material moving operations are performed through the use of road machines having material moving blades such as graders, tractors, trucks and the like.

The material moving blades employed in these road machines are normally obliquely oriented with respect to the direction of travel so that the material is constantly discharged in a windrowing fashion from one side of the blade. For example, during a snow removal operation it is desirable to prevent the windrowing discharge of the snow at entrance ways such as driveways which join the road surface from which the snow is being removed.

Some prior art devices have been developed, the purpose of which is to control the discharge of snow and other material from the material moving blade during a material moving operation. The devices are in the form of small irregular shaped blades or attachments which are shifted into and out of obstructing relation with the discharge end of the material moving blade. These attachments are normally connected to the material moving blade and normally depend upon coaction with the surface of the ground to be moved into and out of obstructing relation with respect to the material moving blade. These prior art attachments, however, have been found objectionable since because of their inherent construction, positive positioning with respect to the material moving blade cannot be obtained. Further, since no provision has been made for replacing worn parts, only short service can be expected from such devices.

Therefore a general object of this invention is the provision in a road machine of the type having a material moving blade, such as grading machines and the like, of an attachment device, of simple and inexpensive construction, which is positively and effectively shiftable into and out of obstructing relation with respect to the material moving blade thereby permitting controlled moving and discharge of the material by the machine.

Another object of this invention is to provide a gate attachment device which is readily mountable upon a conventional road machine, such as a grader or the like, and which is selectively vertically swingable into and out of obstructing relation with respect to the material moving blade of the machine, and is especially adaptable for use during a snow removal operation to allow an operator to prevent the windrowing discharge of the snow into driveways and other entrance ways which connect with the road being treated.

A further object of this invention is to provide a novel and improved gate attachment device of the class described which may be mounted upon any conventional road machine without extensive alteration thereof and which may be very positively and quickly controlled by the operator from the cab, preferably through the medium of a fluid pressure system.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like character references refer to the same or similar parts throughout the several views, and in which:

FIG. 1 is a perspective view of a conventional patrol grading machine employing my invention;

FIG. 2 is a front perspective view of my attachment device in the lowered operative position with respect to the material moving blade of the grading machine, the latter being illustrated in dotted line configuration;

FIG. 3 is a front perspective view similar to FIG. 2 but with the attachment device illustrated in the raised inoperative position;

FIG. 4 is a top plan view of my attachment device illustrated in the lowered operative position with respect to the material moving blade; and

FIG. 5 is a transverse sectional view taken approximately along line 5—5 of FIG. 4 and looking in the direction of the arrows.

Referring now to the drawings and more specifically to FIG. 1 it will be seen that one embodiment of my novel gate attachment device, designated generally by the reference numeral 10, is illustrated in close combinative relation with a conventional patrol grader designated by the reference numeral 11. The patrol grader 11 includes the main frame 12 supported for traversing movement over the ground by the articulate front wheels 13 and the tandemly-arranged driven rear wheels 14. The grading machine 11 also includes the conventional diesel engine 15 and has the usual cab structure 16. The grader 11 is provided with the usual draw bar 17 which revolvably supports the blade circle 18. The standard mold board type material moving blade 19 is mounted on the blade circle 18 in the usual well known manner for movement therewith. This material moving blade is also provided with the conventional means for permitting adjustment of the blade either manually or by power operation to various selected positions in the well known manner.

It is pointed out that during the snow removal operation, the material moving blade 19 will be oriented in oblique relation with respect to the path of travel of the machine as best seen in FIGS. 1 and 2. Snow will be engaged by the front face of the material moving blade and will be discharged in windrowing fashion from the rearwardly disposed end of the blade. During this snow removal operation from a roadway, it is desirable to prevent the lateral discharge of the snow into entrance ways, such as driveways or the like, which connect with the road being cleared. My novel gate type attachment device 10 is especially adaptable in permitting this controlled type of discharge from the material moving blade 19.

Referring now to FIGS. 2 and 5 it will be seen that my gate type attachment device 10 includes a substantially rectangular flat gate member 20 preferably constructed of a suitable rigid meallic material and having an elongate generally rectangular cutting edge element 21 secured to the lower edge thereof. It is preferred that this cutting edge element 21 be detachably connected to the lower peripheral edge portion of the gate member 20 by bolt assemblies or the like to permit removal of this cutting edge element when the same becomes worn. It will be noted that this cutting edge element is tapered slightly downwardly, the lower edge thereof being substantially straight and substantially parallel with the upper peripheral edge of the gate member 20. It will be noted that the upper peripheral edge of the gate member 20 has a centrally located recess 22 therein the purpose of which will be explained more fully hereinbelow.

The gate member 20 also has a pair of elongate rigid laterally spaced-apart arms or links 23 secured to the

rear surface thereof as by welding. It will be noted that these arms or links 23 are interconnected by a cross brace member 24 to laterally reinforce the same and it will also be noted that these arms are disposed in substantially parallel relation with respect to each other but are disposed in slightly angulated relation with respect to the general plane of the gate member 20. The links 23 and cross brace member 24 define an elongate rigid link structure for interconnecting the gate member to the blade circle 18.

A mounting bracket 25 having an arcuate rear face is rigidly secured to the blade circle 18 as by welding and this mounting bracket has a plurality of apertured ears 26 rigidly affixed thereto and projecting laterally therefrom. These ears 26 are arranged in spaced-apart pairs adjacent opposite ends of the bracket and each pair receives therebetween one of the arms or links 23. Each of the arms 23 are pivotally connected to its associated pair of mounting ears 26 by means of pivot pins 27.

Referring now to FIG. 4 it will be noted that the pivot pins 27 are axially aligned so that the pivotal axis of the gate member 20 is disposed in substantially transversely extending relation with respect to the longitudinal axis and the general plane of the material moving blade 19. Thus it will be seen that the gate member 20 is mounted for vertical swinging movement between an inoperative raised position, as shown in FIG. 3, and a lowered operative position as best seen in FIGS. 2 and 5. It will be noted that when the gate member 20 is in the lowered operative position it is positioned in contacting relation or at least in very close proximity to the rearwardly disposed end of the material moving blade 19 and in obstructing relation with the front face of the material moving blade to thereby prevent discharge of material from that end of the blade. It is also pointed out that the material moving blade 19 is normally obliquely arranged, as illustrated in FIGS. 1 and 4 for snow removal and grading operations. When the material moving blade is so disposed, the gate member 20 will be longitudinally arranged in the direction of movement of the grading machine 11.

Means are also provided for causing vertical swinging movement of the gate member 20 between the lowered operative and the elevated inoperative positions. To this end it will be seen that an elongate mast structure or mounting post member 28 is rigidly mounted in upstanding relation upon the mounting bracket 25. This mounting post member is affixed to the mounting bracket 25 by any suitable securing means such as welding or the like. It will be noted that the upper end of the mounting post member 28 is provided with a pair of laterally spaced-apart curved attachment ears 29 which are suitably apertured for the reception of a pivot 30 therethrough.

The gate member 20 also has a pair of laterally spaced-apart apertured attachment ears 31 affixed to the rear surface thereof. These ears 31, as best seen in FIGS. 4 and 5 are disposed adjacent the upper peripheral edge of the gate member and between the arms 23. The lower end of a hydraulic cylinder 33 is pivotally connected to the attachment ears 31 by a pivot 32 and this hydraulic cylinder 33 is provided with an extensible and retractable piston rod 34, the upper end of which is pivotally connected to the attachment ears 29 by the pivot 30. This hydraulic ram is of the double acting type and suitable conduits 35 interconnect the cylinder 33 to a suitable source of hydraulic fluid carried by the patrol grader machine 11. When the piston rod 34 is in the retracted position, as best seen in FIG. 3, the gate member 20 will be elevated to the inoperative position and when the piston rod is extended, the gate member will be disposed in the lowered operative position. It is also pointed out that the controls for operating the double acting hydraulic ram will be located within the cab structure 16 for easy access by the operator thereof.

When my novel gate type attachment device is used in conjunction with a grading machine during a snow removal operation, the gate member 20 will be elevated to the inoperative position as the material moving blade 19 traverses the roadway being cleared to remove the snow therefrom. As the grading machine approaches an entrance way to the roadway being cleared, such as a driveway or the like, the operator will actuate the controls to cause the extension of the piston rod 34 whereby the gate member will be very quickly lowered to the operative position. When the gate member 20 is in the lowered operative position, the lower peripheral edge of the cutting edge element 21 will, under most conditions, preferably engage the road surface being cleared while the rear end portions of the gate member and cutting edge element will engage or be disposed in very close proximity to the rearwardly disposed end portion of the material moving blade 19.

Therefore since the gate member is disposed in obstructing relation with respect to the discharge end portion of the material moving blade, the snow will accumulate against the front surface of the material moving blade and will not be discharged as the material moving blade passes the entrance way. As the material moving blade 19 passes the entrance way, the operator may actuate the controls to cause the piston rod 34 to be attracted into the cylinder 33, thus causing rapid positive raising of the gate member from obstructing relation with regard to the front face of the material moving blade. This permits the snow to be windrowed in a controlled manner along the road surface being cleared. The recess 22 in the gate member 20 permits the gate member to be raised to a position so that there is no interference thereof with the vision of the operator.

My novel gate attachment device may also be used in conjunction with a grading machine during a surfacing operation wherein material such as gravel is to be distributed over a large surface such as a parking lot, roadway or the like. In this type of operation it is desirable to control the distribution of the material and especially wherein a large mound or pile of such material must be equally distributed. Since in the conventional surfacing operation of this type, the material is constantly being discharged as it is moved, it becomes necessary to constantly traverse the area being surfaced to get the proper equal distribution. However, through the use of my gate type attachment device, material can be carried from one point to a substantially remote location while preventing discharge and distribution of the material during traversing movement of the grading machine.

Similarly, my novel gate type attachment may also be used during a shouldering operation wherein it is desirable to control the distribution of material such as large stones and the like. In this type of operation, it is often times desirable to discharge the stones at a predetermined point and in conventional grading machines no provision is made for this controlled type of discharge simultaneously during the shouldering operation. However, through the use of my novel gate type attachment device it now becomes possible to not only simultaneously perform the shouldering operation but also to control the discharge of material such as stones and the like.

From the foregoing description it will be seen that I have provided a novel and improved gate type attachment device for use in conjunction with material moving blades associated with grading machines, and which is especially adaptable in controlling the distribution and discharge of material from the material moving blade.

It will also be seen from the preceding paragraphs that my novel gate type attachment device is especially adaptable for use in snow removal operations wherein windrowing of snow into entrance ways to the road being cleared may be effectively controlled by the operator of the machine.

It will therefore be seen that I have provided a novel

and improved gate type attachment device, which is not only of simple and inexpensive construction, but one which functions in a more efficient manner than any heretofore known comparable devices.

It will of course be understood that various changes may be made in the form, details, arrangement and proportions of the various parts without departing from the scope of my invention.

What is claimed is:

1. In combination with a mobile grading machine of the type having an annular revolvable blade mounting structure, and a blade mounted on said annular mounting structure for movement therewith,

an attachment device including a generally rectangular gate structure having a substantially straight lower edge,

an elongate link structure having one end connected to said gate structure and having the other end thereof pivotally connected to said annular blade mounting structure for vertical swinging movement relative thereto between an elevated inoperative position above the blade and a lowered operative position wherein the lower peripheral edge of the gate structure is disposed in engaging relation with the surface of the ground, said gate and link structures being bodily movable with the annular blade mounting structure during revolving movement of the latter,

said gate structure when in said lowered position being disposed in transversely extending obstruction relation with respect to the discharge end of the blade to thereby prevent the discharge of material therefrom,

a mast structure mounted on said annular blade mounting structure and extending upwardly therefrom adjacent the axis of pivot of said link structure,

and an actuator mechanism extending between and respectively connected to the upper end portion of said mast structure and said gate structure and being operable for selectively causing vertical swinging movement of said gate structure between said operative and inoperative positions independently of any movement of the grading machine blade relative to the annular blade mounting structure.

2. In combination with a mobile grading machine of the type having an annular revolvable blade mounting structure, and a blade mounted on said annular mounting structure for movement therewith,

a substantially rectangular gate member,

an elongate cutting edge element having a substantially straight lower cutting edge detachably affixed to the lower marginal portion of said gate member and depending therefrom,

an elongate link structure having one end thereof fixedly connected to said gate structure and having the other end thereof pivotally connected to said annular blade mounting structure adjacent the periphery thereof whereby to permit vertical swinging movement of said gate member between an elevated inoperative position above said blade and lowered operative position wherein the lower edge of the cutting edge element is disposed in substantially engaging relation with the surface of the ground, said gate member and link structures being bodily movable with said annular blade mounting structure during revolving movement of the latter,

said gate member when in said lowered operative position being disposed in transversely extending obstructing relation with respect to the discharge end of the blade to thereby prevent the discharge of material therefrom,

an elongate mast structure mounted on said annular blade mounting structure and extending upwardly therefrom adjacent the axis of pivot of said link structure,

and an elongate fluid pressure piston and cylinder unit having one end thereof connected to said gate member and having the other end thereof connected to said mast structure adjacent the upper end thereof whereby upon extension and retraction of the piston and cylinder unit, said gate member will be vertically swung between said operative and inoperative positions independently of any movement of the grading machine blade relative to the annular blade mounting structure.

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