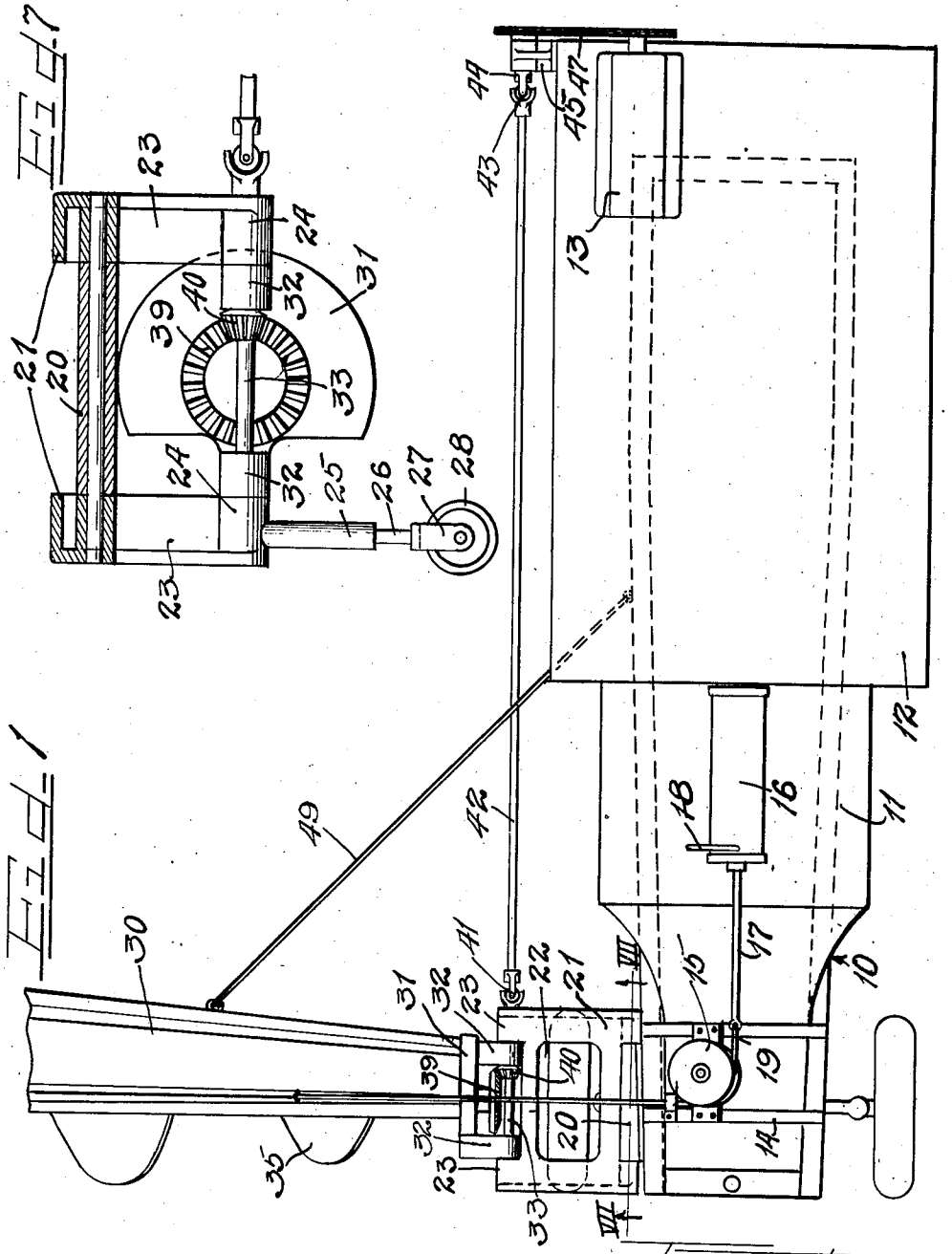
May 3, 1938. S. C. SLEEPER ET AL 2,115,790

SNOWBANK CUTTER

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SNOWBANK CUTTER

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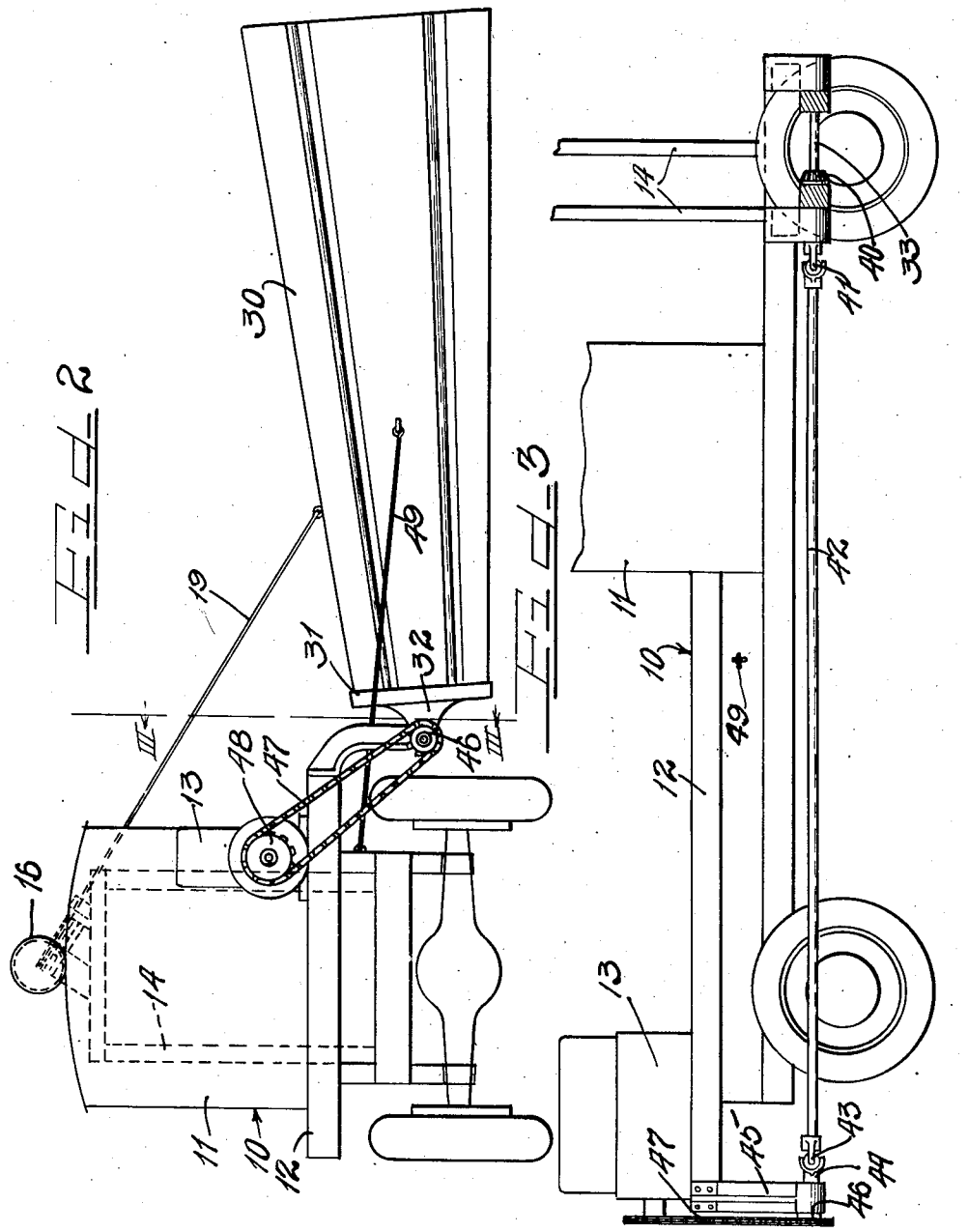


Fig. 2

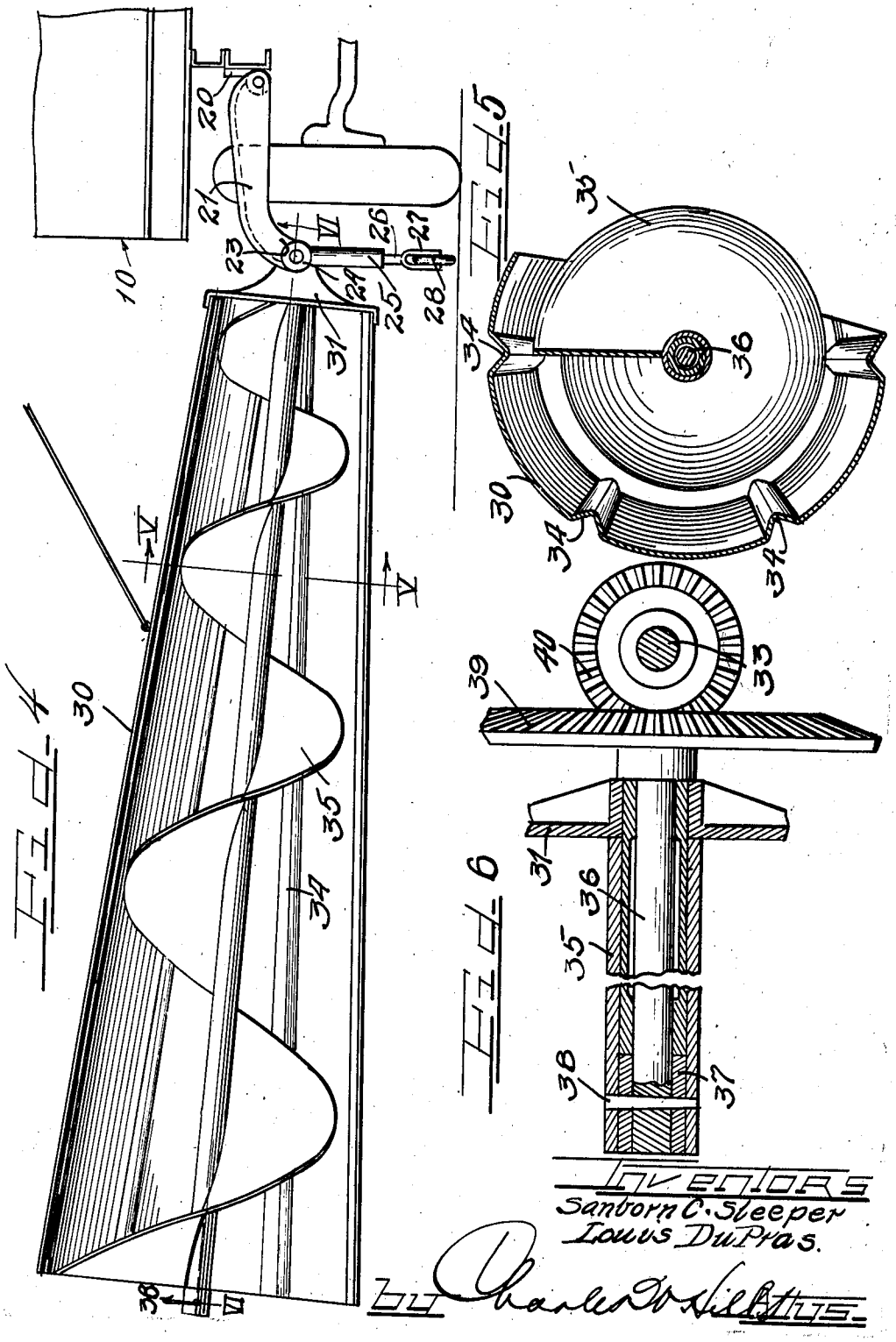
Fig. 3

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SNOWBANK CUTTER

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SNOWBANK CUTTER

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Application May 19, 1937, Serial No. 143,418

11 Claims. (Cl. 37—43)

This invention relates to a motor propelled device adapted to cut down snow banks at the sides of roadways. The device is usable in connection with snow plows that clear the roadways and can follow such snow plows.

It has heretofore been the practice, in clearing snow from highways, to merely push the snow to the sides of the road. Such road clearance causes the building up of snow banks on each side of the road. Furthermore, many places along the highways are subject to natural snow drifts alongside of the road. Whenever a snow bank is formed, either artificially or naturally, alongside of a road, snow is apt to drift adjacent the snow bank and cover the road. It is therefore important to remove these snow banks from the sides of the road, and the device of this invention is adapted for such removal of snow banks by cutting down the banks and propelling the snow at great distances from the road.

It is then an object of this invention to provide a snow bank cutter.

A further object of this invention is to provide a self-propelled vehicle with a laterally extending device adapted to cut into banks of snow along a roadway and discharge the snow at great distances from the road.

Another object of this invention is to provide a wing or moldboard on the side of a self-propelled vehicle adapted to be disposed over the shoulders of roads for cleaning out snow deposited on such shoulders.

A further object of this invention is to provide a laterally extending moldboard with a screw propeller for ejecting snow received on the moldboard laterally therefrom.

A further object of this invention is to provide a simple wing mounting structure with a screw propeller for cutting down snow banks.

Other and further objects of this invention will become apparent to those skilled in the art from the following detailed description of the annexed sheets of drawings which disclose a preferred embodiment of the invention.

On the drawings:

Figure 1 is a top plan view of a truck equipped with a snow bank cutter of this invention extending laterally from the truck with the end thereof broken away.

Figure 2 is a rear elevational view of the truck and snow bank cutter shown in Figure 1.

Figure 3 is a cross-sectional view, with parts in elevation, taken substantially along the line III—III of Figure 2.

Figure 4 is a front elevational view of the snow bank cutter of this invention illustrating the manner in which the moldboard of the cutter is carried from a truck.

Figure 5 is a cross-sectional view taken substantially along the line V—V of Figure 4.

Figure 6 is a horizontal cross-sectional view, with parts in elevation, and with parts broken away, taken substantially along the line VI—VI of Figure 4.

Figure 7 is a cross-sectional view, with parts in elevation, taken substantially along the line VII—VII of Figure 1.

As shown on the drawings:

In Figures 1 to 4 inclusive, the reference numeral 10 designates generally a motor truck having a driver's cab 11 and a platform back 12. An auxiliary motor 13 is mounted on the platform back 12.

The main chassis of the motor truck 10 carries a superstructure 14 which, as best shown in dotted lines in Figure 2, extends upwardly in front of the cab 11. The superstructure 14 carries at the top thereof a sheave 15 for a purpose to be hereinafter more fully described.

The roof of the cab 11 has mounted thereon a fluid pressure cylinder 16 having a piston rod 17 extending therefrom. A piston (not shown) is disposed in the cylinder 16 and is operated by fluid pressure, such as oil pressure, through a tube 18 communicating with the forward end of the cylinder as shown in Figure 1. A valve (not shown) disposed in the driver's cab, controls the flow of oil to the cylinder for operating the piston rod 17 into and out of the cylinder. The piston rod 17 has secured on the end thereof a cable 19 disposed around the sheave 15.

As best shown in Figures 1 and 4, the main frame of the motor truck 10 carries near the front end thereof a bracket 20 to which is swivelled a platform 21 extending over the front wheel of the truck. The platform 21 may have an opening 22 in the central portion thereof allowing the top of the wheel to extend above the platform.

The outer end of the platform 21 has downturned arms 23 best shown in Figures 4 and 7. The arms 23 have bosses 24 on the ends thereof.

One or both of the arms 23 can be provided with a housing portion 25 extending downwardly therefrom below its boss 24 for receiving the shank 26 of a wheel mounting 27 carrying a supporting wheel 28.

The platform 21 can thus be held in desired spaced relation from the ground by adjusting

the position of the shank 26 in the housing 25. The wheel 28 will hold the outer end of the platform 21 in a desired horizontal position.

A moldboard or wing member 30 of segmental conical shape has the small end mounted in a plate 31. The plate 31 carries brackets 32 which are pivoted to the bosses 24 of the arms 23 by a rod 33 extending through the bosses and brackets as shown in Figures 1 and 7.

The moldboard or wing 30 is formed of comparatively light weight sheet metal and has an open front face adapted to scoop up snow. The large end of the moldboard or wing may be from 12 to 15 feet away from the motor truck 10 and the wing is adapted to be swung outward over the shoulders and ditches of highways.

A plurality of inturned ridges 34 extending longitudinally in the inner face of the moldboard 30 may be crimped into the sheet metal forming the moldboard to rigidify the same and also to aid in clearing the moldboard of snow as will be more fully hereinafter described. A screw conveyor or propeller 35 is mounted in the moldboard 30 on a shaft 36 extending through the center of the moldboard and through the plate 31. As best shown in Figure 6, the end of the shaft receives a boss 37 thereon and a pin 38 extends through the end of the screw conveyor tube, the boss 37 and the shaft 36.

The other end of the shaft 36 receives, on the outside of the plate 31, a bevelled gear 39 adapted to drive the shaft and thus rotate the screw conveyor. The gear 39 is in mesh with a bevelled gear 40 secured on the rod 33.

The back end of the rod 33 receives a universal joint 41 connecting the rod with a shaft 42 extending alongside of the motor truck to the rear end thereof. The rear end of the shaft has a second universal joint 43 thereon which joint 43 is secured to a bearing member 44 carried in a bracket 45 secured to the platform 12 of the motor truck.

The bearing 44 has a sprocket gear 46 on the back end thereof driven by a chain 47 from a sprocket gear 48 on the auxiliary motor 13.

The screw conveyor 35 is thus driven by the auxiliary motor 13 and the moldboard 30 can be raised or lowered as desired carrying the screw conveyor therewith without interfering with the driving of the screw conveyor.

A reinforcing rod or brace 49, best shown in Figures 1 and 2, is hingedly connected to a midportion of the moldboard 30 and an intermediate portion of a frame of the motor truck. This brace 49 serves to hold the mold board in lateral relation to the motor truck.

It has been pointed out above that a cable 19 is secured to the piston rod 17 of the hydraulic cylinder 16. The other end of this cable 19 is secured to the mold board 30 intermediate the ends thereof. An operation of the piston rod 17 into and out of the cylinder 16 thus serves to raise and lower the moldboard relative to the truck. This cylinder is operated to lift the moldboard to clear mailboxes, telegraph posts and the like when such encumbrances are met along the shoulders of the roadway.

In operation, the screw conveyor 35 is driven at comparatively high speed and a forward movement of the truck moves the moldboard into snow banks formed along the roadway. The screw conveyor forcibly ejects the snow out of the large end of the moldboard and actually blows the snow a considerable distance from the roadway. The crimped portions 34 forming ridges in the moldboard guide the snow longitudinally out of the moldboard.

The moldboard or wing can be rapidly raised or lowered to encounter snowbanks of various heights and if very high snow banks are encountered several cuts may be taken through such banks to reduce their height to a desired level. The guide wheel 28 determines the normal height of the moldboard from the roadway and, as described above, this wheel is adjustable vertically so that any desired height for the moldboard can be obtained.

The hydraulic cylinder 16 rapidly raises the moldboard out of the path of mail boxes, telegraph posts, snow fences and other encumbrances.

The invention has been described in combination with a motor truck. While it is desired to use a wheeled vehicle for carrying the snow bank cutter, it should be understood that any type of vehicle is operative.

The provision of a moldboard having a larger outer end than inner end prevents a clogging of the device with snow since the screw conveyor moves the snow out of the large end of the moldboard and because it is larger than the inner end, the snow is not compacted during its passage out of the moldboard. High speed operation of the screw conveyor 35 actually effects a blowing of the snow into the field adjacent the road sides.

We are aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and we, therefore, do not purpose limiting the patent granted hereon otherwise than necessitated by the prior art.

We claim as our invention:

1. A snow bank cutter comprising a propelled vehicle having a main frame, a platform member swivelly connected to said main frame at the front end of the vehicle, a wheel for supporting said platform from the ground, a moldboard swivelly connected to said platform, a screw propeller in said moldboard and means on said vehicle for driving said propeller.

2. A snow bank cutter comprising a self-propelled vehicle, a wing member extending laterally from a side of the vehicle and swivelly connected thereto, said wing member having an open end spaced from the vehicle, a screw conveyor in front of said wing member, an auxiliary motor on said vehicle for driving said screw conveyor at high speeds to blow snow out of the open end of the wing member away from the vehicle, and means for raising said wing and screw conveyor relative to the vehicle.

3. A snow bank cutter comprising in combination with a motor truck, a platform swivelly connected to the main frame of the motor truck extending on each side of a front wheel of the truck, an adjustable wheel for holding the platform in spaced relation from the ground, a plate member swivelly connected to the platform, a sheet metal moldboard secured to said plate and extending laterally therefrom, said moldboard being arcuately curved and flared outward away from the plate, a screw conveyor mounted in said moldboard, an auxiliary engine on said truck, means operatively connecting said engine with said screw conveyor for driving the conveyor, a hydraulic cylinder operatively connected with the moldboard for raising and lowering the same and a brace member secured to an intermediate por-

tion of the moldboard and to the truck for holding the moldboard laterally of the truck.

4. A snow bank cutter comprising a self-propelled wheeled vehicle, an auxiliary engine carried at the back end of said vehicle, a wing member extending laterally from the front end of the vehicle having an open end spaced from the vehicle, means swivelly connecting the wing member to the vehicle, a screw conveyor rotatably mounted adjacent the front face of the wing member, and substantially coextensive therewith, means driven by the auxiliary engine connected to the screw conveyor for rotating the conveyor at high speeds to act as a blower, and means for raising and lowering said wing and screw conveyor relative to the vehicle whereby said vehicle is adapted to push said wing into snow banks and said screw conveyor blows the snow laterally out of the open end of the wing.

5. In a device of the class described, a wing member having a concave front face, raised rib portions extending longitudinally along said face and a screw conveyor coextensive with said wing adjacent said face.

6. In a leveling device, a scoop shaped wing member converging toward its inner end and means for moving material received by the wing out of the large end thereof.

7. In a leveling device, a scoop shaped moldboard converging toward one end thereof and a screw conveyor in said moldboard having the blades convergent therewith.

8. A snow bank cutter comprising a vehicle adapted to travel along a roadway, a moldboard pivotally connected to the vehicle for movement in a vertical plane about the pivotal axis, said moldboard adapted to extend laterally over the shoulders and ditches along the roadway, a screw rotatably mounted in front of said moldboard and adapted to move therewith, a motor on said vehicle operatively connected to the screw for rotating said screw at high speeds to blow snow out of the end of the moldboard away from the vehicle and means on said vehicle to swing the moldboard about its vertical axis, said snow bank cutter being free from stationary laterally extending parts whereby said means can raise all laterally extending structure so as not to extend beyond the roadway.

9. A snow bank cutter comprising a vehicle adapted to travel along a roadway; an open face arcuate shaped moldboard pivotally connected to the vehicle for movement in a vertical plane above the pivotal axis, said arcuate moldboard having a small closed end adjacent the vehicle and a large open end spaced from the vehicle, the moldboard diverging from the small to the large open end, a screw rotatably mounted in said moldboard and having the blades thereof diverging symmetrically with the moldboard, said screw adapted to move in a vertical plane with the moldboard, a motor on said vehicle operatively connected to the screw for rotating the screw at high speeds to blow snow out of the open end of the moldboard and means on said vehicle to swing the moldboard about its pivotal axis, said snow bank cutter being free from stationary laterally extending parts whereby said means can raise all laterally extending structure so as not to extend beyond the roadway.

10. In a snow bank cutter, a vehicle adapted to travel along a roadway, a platform member pivotally connected to the vehicle, a ground wheel for supporting the platform laterally of the vehicle, means for adjusting the ground wheel to raise and lower the platform and an arcuate shaped moldboard secured to said platform and adapted to extend laterally therefrom.

11. A snow bank cutter comprising in combination with a motor truck, a platform swivelly connected to the main frame of the motor truck, a ground wheel for holding the platform laterally of the truck, means for adjusting the ground wheel to raise and lower the platform from the ground, an arcuate shaped moldboard swivelly connected to the platform, said moldboard diverging from the platform and having a large open end, a screw mounted in said moldboard, an auxiliary engine operatively connected to said screw for rotating the screw at high speeds, and a hydraulic cylinder on said truck operatively connected with the moldboard for raising and lowering the same whereby the moldboard is adapted to extend laterally from the truck over the shoulders and ditches of a roadway for scooping up snow therefrom, said screw conveyor being adapted to blow the snow out of the open end of the moldboard away from the roadway and said hydraulic means being adapted to swing all of the parts extending laterally from the truck beyond the roadway upwardly in a vertical plane so as to carry said parts within the limits of the roadway.

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