

Oct. 13, 1942.

G. B. KESTER

2,298,768

SNOW PLOW

Filed June 7, 1940

2 Sheets-Sheet 1

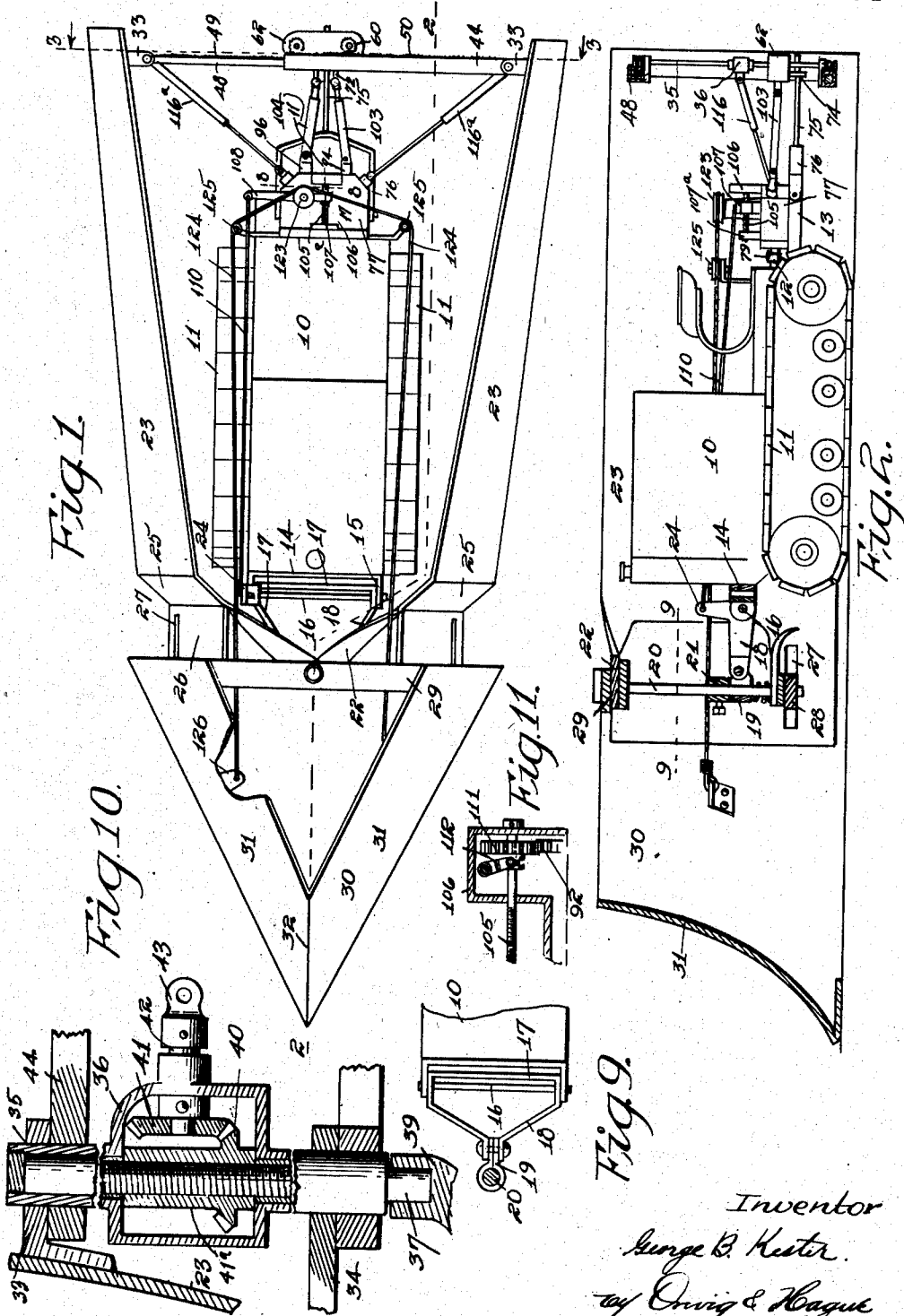


Fig. 9.

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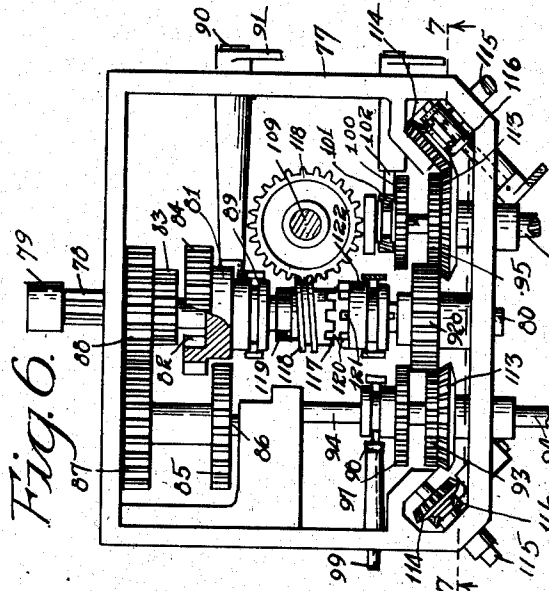


Fig. 6.

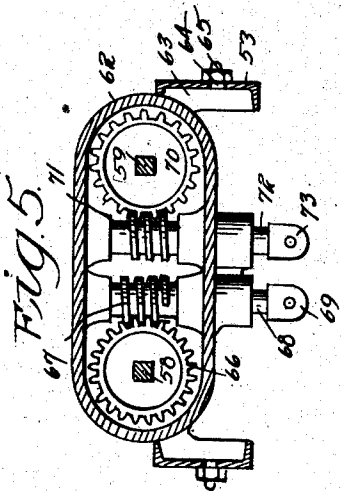
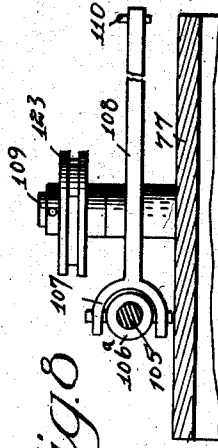


Fig. 5.



UNITED STATES PATENT OFFICE

2,298,768

SNOW PLOW

George B. Kester, Tingley, Iowa

Application June 7, 1940, Serial No. 339,335

18 Claims. (Cl. 37-44)

This invention relates to improvements in snow plows. The object of my invention is to provide a snow plow so constructed and arranged that the tractor for operating the snow plow may be mounted between a pair of forwardly and rearwardly inclined blades, wherein the power from the tractor may be applied to the forward end of the blades in such a manner as to stabilize the blades when in action, against side draft or lateral movement, and in connection therewith, improved means for attaching the blades to the forward end of a tractor and for elevating and lowering the same.

A further object of my invention is to provide in a snow plow of the type above described and in which is employed blades of a considerable height or width, in the neighborhood of six feet or more, improved means for adjusting the rear or free ends of the blades toward and from each other and for stabilizing the blades against inward and outward movement of the top edges of the blades relative to inward and outward movements of the bottom edges of the blade, to overcome the tendency of the lower edges of the blade to move inwardly relative to the upper edges when a larger portion of the pressure is applied to the lower edges of the blades.

A further object is to provide in a snow plow of the type having a pair of forwardly and inwardly inclined blades, with a power-applying means between the blades, improved means for moving the free ends of the blades toward and from each other and relative to the tractor, and wherein either of the blades may be moved inwardly or outwardly independently of the other to assist in the steering of the plow and to adjust the width of the path cleared thereby, and, further, to provide in connection therewith improved means for elevating and lowering the rear ends of said blades by power derived from the power take-off of the tractor.

A further object of my invention is to provide in a snow plow, other means to assist in the steering of the snow plow, which consists in providing ahead of the forwardly and inwardly inclined blades, a pointed head or wedge pivotally mounted to swing laterally, and in connection therewith, means actuated from the power take-off of the tractor for adjusting said head.

A further object is to provide in a snow plow of the type above described, an improved gear mechanism which may be detachably connected to the draw bar of a tractor and operatively connected with the power take-off shaft for performing all of the above mentioned adjustments,

wherein the gears are all enclosed in a single box or casing.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of my improved snow plow, showing the manner in which it is attached to a tractor, preferably of the type employing endless and flexible treads;

Figure 2 is a longitudinal and sectional view of the same taken on the line 2-2 of Figure 1;

Figure 3 is a transverse sectional view taken on the line 3-3 of Figure 1;

Figure 4 is an enlarged sectional view taken on the line 4-4 of Figure 3;

Figure 5 is an enlarged detail sectional view taken on the line 5-5 of Figure 3;

Figure 6 is a top view of the gear casing with the cover plate removed, portions being broken away;

Figure 7 is a detail sectional view taken on the line 7-7 of Figure 6;

Figure 8 is an enlarged detail sectional view taken on the line 8-8 of Figure 1;

Figure 9 is a detail sectional view taken on the line 9-9 of Figure 2;

Figure 10 is an enlarged detail sectional view taken on the line 10-10 of Figure 3; and

Figure 11 is a sectional view taken on the line 11-11 of Figure 1.

On the drawings I have used the reference numeral 10 to indicate a tractor having an endless tread 11 and a power take-off shaft 12 and a draw bar 13, which are of ordinary construction. Mounted on the forward end of the tractor 10 is a cross bar 14 having at each end a forwardly extending portion 15 for supporting a shaft 16, to which is pivotally supported a frame 17, having forwardly and inwardly extending members 18 pivotally supporting a collar 19, in which is slidably mounted a vertical shaft 20 held against downward movement by means of an adjustable collar 21. Mounted on the shaft 20 are horizontally and transversely arranged members 22 forming part of the side wings 23 and providing means for pivotally supporting the forward end of said side wings to permit their rear ends to swing toward and from each other, and at the same time provide means for mounting the forward end of the said side wings to the forward end of the tractor, the said side wings 23 extending on each side of the tractor

and terminating in a point some distance beyond the rear end thereof, so that, when the tractor is mounted between the forward ends of the wings, it provides means for applying power to the forward ends thereof, for advancing the said wings forwardly and over the ground surface.

The frame 17 is provided with an upwardly extended arm 24 by means of which the forward ends of the members 18 may be raised and lowered, and which in turn provides means for raising and lowering the forward ends of the blades 23. The forward end of each of the blades 23 is provided with a forwardly and inwardly inclined portion 25 terminating in forwardly extending portions 26 having horizontal slots 27 near their lower ends for receiving a horizontally arranged bar 28 mounted on the lower end of the shaft 20.

Mounted above the top members 22 and on the said shaft 20 is a bar 29, the bars 28 and 29 being fixed to the lower and upper ends of the shafts 20 and adapted to support the rear end of the nose portion 30, which comprises forwardly and inwardly inclined diverging and upwardly and inwardly inclined cutter blades 31, terminating in a cutter edge 32. The rear ends of the blades 31 are designed to overlap the forward ends of the forwardly extending portions 26 wherein the member 30 as a unit may be pivoted about the shaft 20, with the rear edges of the blades 31 substantially in alignment with the front edges of the blades 23. The said member 30 provides means for penetrating a snow drift and for separating the snow to deliver the same to the blades 23. By pivoting the said head 30, means is provided whereby a lateral suction may be created in the direction in which the pointed end is swung, to thereby assist in steering the forward end of the tractor and also the forward end of the blades 23. It is oftentimes necessary to penetrate a snow drift in which the drift is very deep at one side of the highway and is comparatively shallow on the other side of the highway, so that if the drift was penetrated with the nose portion or pointed end of the head in alignment with the central longitudinal axis of the tractor, a side draft would be created tending to point the tractor out of the drift, while with my improved construction the forward end of the head 30 could be pivoted to enter the deeper side of the drift, which would tend to pull the forward end of the tractor and the blades into the drift rather than out of the drift. Means hereinafter described is provided for steering the said head.

It is oftentimes desirable that the rear end of one of the blades 23 be moved to a greater distance from the longitudinal center of the tractor than that of the rear end of the other blade, thus assisting and co-ordinating with the aforementioned action of the nose in overcoming side draft and steering the plow, or it may be desirable to move both of the free ends of the blades outwardly or inwardly to vary the width of the path cleaned by the snow plow. To accomplish this I have provided the following mechanism:

Mounted on the inner surface of the rear ends of each of the blades 23, and near their top edges, I have provided a bracket 33, and near the bottom of each of the said blades I have provided a bracket 34, the inner ends of said brackets rotatably supporting a vertically arranged tube 35, the central portion of which is provided with a gear casing 36. Extending longitudinally

through the tube 35 is a shaft 37 having its outer surface screw-threaded. Pivotally connected to the lower end of each of the shafts 37 is a caster wheel 39 providing means for supporting the weight of the blades 23, which weight is carried by means of a bevel gear 40 threaded on the shaft 37, said bevel gear serving as a nut, said gear having a hub 41a on which the upper side of the casing 36 is mounted, thus providing means for supporting the tubular member 35, and in turn therewith the brackets 33 and 34. It will be seen that as the gear 40 is rotated, the tubular member 35 may be elevated or lowered with respect to the shaft 37, said gear 40 being rotated by means of a bevel gear 41 driven by a shaft 42 from a universal joint 43 which is operated in the manner hereinafter described.

Pivotally supported on the upper end of one of the tubes 35 and resting on a collar 35a, adjustably fixed thereto, is a tubular bar 44 having its back side provided with a longitudinal slot 45. Pivotally mounted on the lower end of said tubular member 35 is a second tubular bar 46 having a slot 47 in its rear side. Telescopically supported in each of the members 44 and 46 is a bar 48 having their outer ends pivotally supported on the upper and lower ends of another one of the tubular members 35, the upper member 48 being supported by a collar 35b, as clearly illustrated in Figure 3 the collars 35a and 35b serving to support the weight of the bars 44 and 48, and they in turn the weight carried by the brackets 33. The rear face of each of the bars 48 is provided with a rack 49. The upper edge of the back side of the member 44 is provided with a rack 50, while the back edge of the member 46 is provided with a rack 51. The inner ends of the tubular members 44 and 46 are connected to a vertical frame member 52, so that the members 44 and 46 and the member 52 constitute a rigid frame having its outer end pivotally connected on the corresponding tubular member 35.

Slidably mounted to and between the members 44 and 46 is a carriage 53, said carriage comprising upright channel irons 54 having their upper ends connected to a shoe 55 adapted to travel on the under surface of the member 44, the lower ends of the members 53 and 54 being connected to a shoe 56 adapted to travel on the upper surface of the member 46 so that the carriage is free to move longitudinally between the member 52 and the tubular member 35. The back face of each of the members 55 and 56 is provided with bearings 57 for supporting upright shafts 58 and 59, the ends of the shaft 58 being provided with pinions 60 designed to coact with the racks 50 and 51, while the ends of the shaft 59 are each provided with a pinion 61 designed to coact with the racks 49, said pinions being fixed to their respective shafts. From this arrangement it will be seen that the tubular shafts 35 may always be supported parallel to each other and that the said tubular members may be moved toward and from each other so that the distance between the blades 23 may be adjusted and at the same time maintain the blades in their proper upright positions. The shafts 58 and 59 and their respective pinions and racks also serve to support the telescopic rack bars in horizontal alignment without bending down in the middle when the blades 23 are at their outer limit of movement. From this it will be seen that the members supporting the said rack bar and the co-operating pinions and shafts 58 and 59 serve to provide a telescopic frame, so

arranged that the blades 23 are held against rocking movement about their longitudinal axis.

Slidably mounted in the channel irons 53 and 54 is a gear casing 62 having lugs 63 formed thereon adapted to travel in the said channel irons (see Fig. 5). Each of the channels is provided with a vertical slot 64 for receiving a bolt 65 to provide means whereby the gear casing may be adjusted at various elevated positions. The shafts 58 and 59 are mounted to pass through said gear casing 62, the shaft 58 being provided with a worm gear 66 which is slidably mounted on said shaft and is designed to mesh with a worm 67 mounted on a horizontal shaft 68, having at its inner end a universal joint 69. A similar worm gear 70 is slidably mounted on the shaft 59 and is in mesh with a worm 71, which is mounted on a shaft 72, having a universal joint 73. By this arrangement it will be seen that the rack bars 50 and 51 may be moved longitudinally relative to the carriage 53 by rotating the shaft 58 by means of gears 66 and 67 and the shaft 68. In like manner the racks 49 may be moved longitudinally by rotating the shaft 59 by means of the gears 70 and 71 and the shaft 72, thus providing means for adjusting the rear ends of the blades toward and from each other.

Extending downwardly from the bottom of the casing 62 is a flange 74 adapted to receive one end of a rod 75, said rod being connected to the frame member 76, which in turn is pivotally connected to the draw bar 13 of the tractor, thus providing means for supporting the carriage 53 against lateral movement relative to the tractor. The carriage is permitted to move upwardly and downwardly due to the pivotal connection between the members 76 and the draw bar 13.

For operating the various adjustments above described from power derived from the power take-off shaft 12 I have provided a gear casing 77, which is adapted to be located on the draw bar 13 rearwardly of the rear end of the shaft 12, as illustrated in Figure 2. Supported in the front side of the gear casing 77 is a shaft 78 operatively connected with the shaft 12 by means of a suitable coupler 79; and pivotally mounted on the inner end of the shaft 78 is one end of what I shall term the driven shaft 80. Splined to the forward end of the shaft 80 is a combination internal and external gear device 81, the internal gear 82 being adapted to be moved into and out of mesh with a pinion 83 carried by the shaft 78, while the external gear 84 is adapted to be moved into and out of mesh with a spur gear 85, carried by a counter shaft 86, the forward end of the counter shaft 86 being provided with a gear 87 in mesh with a gear 88 carried by the shaft 78. A suitable yoke 89 is carried by a shaft 90 and provides means for sliding the gear 81 to either of two operative positions.

The mechanism thus described constitutes the reverse mechanism wherein the shaft 80 may be disconnected from the shaft 78 or it may be driven in either direction by manipulation of the shaft 90 through the lever 91.

Fixed on the rear end of the shaft 80 is a spur gear 92 adapted to mesh with a gear 93 rotatably mounted on a counter shaft 94 and also in mesh with a gear 95 rotatably mounted on a counter shaft 96. Splined to the shaft 94 is a spur gear 97 which may be moved into and out of operative position with the gear 92 by means of a fork 98 mounted on a rock shaft 99. The shaft 96 is also provided with a spur gear 100, which is splined thereto and adapted to be moved into

and out of operative relation with the gear 92 which is controlled by a fork 101 mounted on a shaft 102. The rear end of the shaft 94 is connected to a telescopic shaft 103, which in turn is connected to the shaft 72. Means is thus provided whereby the racks 50 and 51 may be actuated from power derived from the shaft 12 simply by moving the gear 97 into mesh with the gear 92. In like manner, the shaft 96 is connected to a telescopic shaft 104 by means of suitable universal joints, said shaft 104 being connected to the shaft 68, thus providing means whereby the racks 49 may be driven from power derived from the shaft 12, the reverse gear mechanism 81 providing means whereby the shaft 92 may be driven in either direction, and thus providing means whereby the said racks may be either moved inwardly or outwardly.

Supported above the shaft 80 is a shaft 105 which is mounted in an upwardly extending portion 106 in the top of the gear casing and has its forward end extending through said portion 106 and mounted in a bearing 107a. This outwardly extending portion of the shaft 105 is screw-threaded and provided with a nut 106a (see Fig. 8) which is pivotally connected to a fork 107 carried on one end of a lever 108, and which is pivotally mounted on a vertical shaft 109. The free end of the shaft 108 is provided with a link 110, the forward end of which is connected to the upper end of the arm 24 carried by the frame member 17. The inner end of the shaft 105 is provided with a gear 111 which is adapted to be moved into and out of mesh with the gear 92 by means of a shift fork 112. By this arrangement it will be seen that if the shaft 105 is rotated, the nut 106a will be caused to move longitudinally of the shaft, and in turn to cause the lever 108 to be rocked about the shaft 109 and the link 110 to be moved longitudinally, causing the collar 19 of the frame member 17 to be elevated or lowered, and with it the forward end of the blades 23, and the entire nose assembly 30, as before described. Inasmuch as the frame 17 is actuated from the screw-threaded shaft 105, it will be seen that the forward ends of the blades 23 and nose 30 will be locked against downward movement at any position where the gear 111 disengages the gear 92. For raising and lowering the back ends of the blades 23 I have provided on the back face of each of the gears 93 and 95 a bevel gear 113, each of which is designed to mesh with a bevel gear 114, one of said beveled gears being mounted on a shaft 115 arranged diagonally in one corner of the casing 77, a shift fork 116 being provided for moving the gear 114 into and out of engagement with the corresponding gear 113.

Operatively connecting the shaft 115 with the universal joint 43 of each of the corresponding ones of the shafts 37, is a telescopic shaft 116a. Thus means is provided for elevating and lowering the rear ends of the blades 23 by simply moving the gears 114 into engagement with the gears 113, after which the shaft 115 will be rotated, causing the shaft 42 to be rotated, and with it the gear 41 and in turn the gear 40, causing the casing 36 and the tubular shaft 35 to be elevated or lowered, and with them the telescopic frame member connecting the rear ends of said blades. It will readily be seen that the rear end of either blade may be elevated a slight distance relative to the other since the entire frame supporting said blades will rock on the pivot connecting the members 18 and 19, or both

blades may be elevated simultaneously, the shaft 15 being reversed by simply operating the reverse gear 81. The screw-threaded shaft 37 provides means for locking the blades in any one of their elevated or lowered positions. The lower end of the shaft 109 is rotatably mounted in the casing 77 and is provided with a worm gear 117, which is designed to mesh with a worm 118 carried on the shaft 80 and limited against longitudinal movement therewith by means of suitable collars 119. One face of the hub of the gear 118 is provided with a clutch element 120 designed to coast with a clutch element 121 carried by a collar 122 which is splined to the shaft 80. Thus means is provided for rotating the shaft 109 by means of the said clutch elements and the worm 118. The upper end of the shaft 109 is provided with a grooved pulley 123 designed to support a cable 124, which is preferably wound once around the pulley in the groove thereof, and having its free end extending over pulleys 125, thence extending forwardly to suitable lugs 126 carried on the inner face of the members 31, as indicated in Figure 1. By this arrangement it will be seen that rotation of the shaft 109 and the pulley 123 will cause the member 30 to be oscillated about the pivot 20, the worm gear 117 serving as means for locking the member 30 in any one of its adjusted positions so that the said member 30 may be moved to position with its apex end in the central longitudinal axis of the tractor, or said end may be shifted to either side of said longitudinal axis to create a suction or draft to assist in steering the forward ends of the blades 23 and also the tractor 10.

Thus, it will be seen that I have provided a snow plow comprising a pointed nose portion which is pivotally mounted to the forward end of a tractor to swing about a vertical axis and in which is provided blades supported on each side of the tractor to increase the width of the cut made by the member 30, each of these blades being adjustable laterally and relative to the tractor, one independently of the other, so that the material may be moved principally to one side of the tractor if so desired, or the material may be moved in opposite directions as the tractor is advanced, the forward ends of the side blades terminating in forwardly and inwardly inclined portions to provide a recess for the rear end of the nose, to prevent snow from entering between the forward ends of the side blades and the tractor.

One advantage of my device lies in the fact that the entire mechanism may be easily and quickly connected to or detached from the tractor by simply removing or attaching the frame member 14, applying the casing 77 and the frame member 76, then making the necessary connections between these members with the blades. When the device is thus applied, all the adjustments of the snow plow may be performed by power from the power take-off shaft. By providing the telescopic frame connecting the rear ends of the side blades means is provided whereby the blades may be moved toward and from each other, and at the same time maintain the blades rigidly in their proper vertical cutting angle or against rotation about their longitudinal axes.

In some types of tractors the power take-off shaft is controlled by the same friction clutch which controls the motion of the tractor. When my device is used with the aforesaid type of tractor it is desirable to include a friction clutch of the conventional type in place of the coupler 79, 75

to permit the shaft 78 to be controlled independently of the tractor-operating mechanism.

I claim as my invention:

1. In a snow plow, a nose portion, a pair of side wings, means for pivoting the forward ends of said wings to the forward end of a tractor to swing about a vertical axis with the tractor between said wings, means for swinging the forward end of the nose portion laterally relative to the longitudinal axis of said tractor and to said wings, means for adjusting the rear end of said side wings toward and from each other and to said tractor.

2. A snow plow attachment for tractors, comprising a nose portion, a pair of side wings, means for pivoting the forward end of said wings to the forward end of a tractor to swing about a vertical axis with the tractor between said wings, means for swinging the forward end of the nose portion laterally relative to the longitudinal axis of said tractor to assist in the steering of said wings, means for adjusting the rear ends of said side wings toward and from each other, and means actuated from the power take-off shaft of a tractor for adjusting said nose and side wings.

3. A snow plow attachment for tractors, comprising a nose portion, a pair of side wings, means for pivoting the forward end of said wings to the forward end of a tractor to swing about a vertical axis with the tractor between said wings, means carried by the tractor for mounting said pivot means to be elevated and lowered, means actuated by the power take-off of a tractor for swinging the forward end of said nose to various laterally adjusted positions, means actuated by said power take-off for adjusting the rear ends of said wings to move toward and from each other, and means actuated by said power take-off for raising and lowering said nose portion and the forward ends of said wings.

4. In a snow plow attachment for tractors, the combination of a tractor, a bracket carried by said tractor, a blade supported on each side of said tractor, means pivoting the forward ends of said blades to said bracket to permit the rear ends of said blades to be adjusted toward and from each other, means for adjusting the rear ends of said blades to move toward and from each other, said means comprising a telescopic shaft connected between the upper edges of the back ends of said blades, a telescopic shaft connected between the lower edges of the back ends of said blades, a vertical brace bar connecting the inner ends of one set of corresponding ends of said telescopic shafts, and means for adjusting said telescopic shafts longitudinally, and means for connecting said telescopic shafts to the rear end of the tractor.

5. A snow plow attachment for tractors, comprising in combination, a tractor, a bracket carried by the forward end of said tractor, a blade supported on each side of said tractor, means pivoting the forward ends of said blades to said bracket to permit the rear ends of said blades to be adjusted towards and from each other, means for adjusting the rear ends of said blades to move toward and from each other, comprising a telescopic shaft carried between the upper edges of the back ends of said blades, a second telescopic shaft connected between the lower edges of the back ends of said blades, a vertical brace bar connecting the inner end of one set of corresponding ends of said telescopic shaft, a rack bar carried by each telescopic member of said shaft, a carriage movably supported to

and between the said set of telescopic bars, having a brace bar, vertical guides carried by said carriage, a gear casing carried by said guides, a pair of vertical shafts rotatably mounted to said carriage and passing through said gear casing, a pinion gear fixed to each end of each shaft, the pinions of one shaft being in mesh with one set of said rack bars, and the pinions of the other shaft in mesh with the other set of rack bars, a worm gear slidably mounted on each shaft and within said gear casing, a worm in mesh with each of said gears, a shaft supporting each of said worms, and means actuated by the power take-off of said tractor for rotating each of said worm shafts independently of each other in either direction, whereby corresponding sets of racks and their respective blades may be moved relative to said tractor, and means for fixing the carriage against lateral movement relative to said tractor.

6. In a snow plow, a nose portion, a pair of side wings, means for pivoting the forward ends of said wings to the forward end of a tractor to swing about a vertical axis with the tractor between said wings, means for swinging the forward end of the nose portion laterally relative to the longitudinal axis of said tractor and to said wings, means for adjusting the rear end of said side wings toward and from each other and to said tractor, and means actuated from the power take-off of said tractor for elevating and lowering the rear ends of said side wings.

7. A snow plow attachment for tractors, comprising a nose portion, a pair of side wings, means for pivoting the forward end of said wings and nose to the forward end of a tractor to swing about a vertical axis with the tractor between said wings, means carried by the tractor for mounting said pivot means to be elevated and lowered, means actuated by the power take-off of a tractor for swinging the forward end of said nose to various laterally adjusted positions, means actuated by said power take-off for adjusting the rear ends of said wings to move toward and from each other, means actuated by said power take-off for raising and lowering said nose portion and the forward ends of said wings, and means actuated from the power take-off of said tractor for raising and lowering said side wings.

8. A snow plow attachment for tractors, comprising in combination a tractor, a bracket carried by the forward end of said tractor, a nose portion, means for pivoting said nose portion to said bracket to swing about a vertical axis, a blade supported on each side of said tractor, means pivoting the forward end of said blades to said bracket to permit their rear ends to be adjusted toward and from each other, means for adjusting said blades, comprising a telescopic shaft carried between the upper edges of the back ends of said blades, a second telescopic shaft connected between the lower edges of the back ends of said blades, means for adjusting the upper and lower telescopic shafts simultaneously, means mounting said adjusting means to hold it against horizontal movement relative to said tractor, and means actuated by the power take-off shaft of said tractor for actuating said adjusting means.

9. A snow plow attachment for tractors, comprising in combination a tractor, a bracket carried by said tractor, a nose portion, means for pivoting said nose portion to said bracket to swing about a vertical axis, a blade supported

on each side of said tractor, means pivoting the forward end of said blades to said bracket to permit their rear ends to be adjusted toward and from each other, means for adjusting said blades, comprising a telescopic shaft carried between the upper edges of the back ends of said blades, a second telescopic shaft connected between the lower edges of the back ends of said blades, means for adjusting the upper and lower telescopic shafts simultaneously, means supported by the tractor mounting said adjusting means to hold it against horizontal movement relative to said tractor, means actuated by the power take-off shaft of said tractor for actuating said adjusting means, means actuated from the power take-off shaft of said tractor for adjusting said nose portion, and means actuated from the power takeoff shaft of said tractor for raising and lowering the ends of said side wings independently.

10. In a snow plow attachment for tractors, the combination of a tractor, a bracket carried by the forward end of the tractor, a bracket pivotally mounted to the first bracket to swing about a horizontal axis, a vertical shaft carried by the second bracket, a nose portion, means for mounting said nose portion to swing about the vertical shaft, a pair of side wings, means for pivotally mounting the forward ends of said side wings to said vertical shaft, and means for rocking said second bracket on its horizontal axis for raising and lowering said nose portion and the forward ends of said side wings.

11. In a snow plow, the combination of a bracket adapted to be attached to a tractor, a nose portion comprising diverging blades and a frame rigidly supporting said blades in fixed relation with each other, means pivotally connecting the back end of said frame to said bracket to swing about a vertical axis, means actuated by power derived from said tractor for swinging the forward end of said nose transversely of its line of travel, and means actuated by power derived from said tractor for elevating and lowering said nose portion.

12. In a snow plow, the combination of a supporting frame, a pair of spaced apart side wings operatively connected thereto, a nose portion, means supporting said nose portion ahead of said side wings to support and move snow outwardly and deliver it to the forward end of said side wings as the snow plow is advanced, means pivotally mounting the rear end of said nose to the forward end of said side wings to swing about a vertical axis, power means applied to the forward end of said wings for moving them forwardly, and means for swinging the forward end of said nose portion transversely of its line of advance to assist in steering said snow plow as it is advanced.

13. In a snow plow, a nose portion, a pair of side wings, means for pivoting the forward ends of said wings to the forward end of a tractor to swing about a vertical axis with the tractor between said wings, and means for swinging the forward end of the nose portion laterally relative to the longitudinal axis of said tractor and to said wings.

14. A snow plow attachment for tractors, comprising a bracket adapted to be carried by a tractor, a nose portion comprising forwardly converging blades, means mounting the nose portion on said bracket to permit its forward end to swing laterally, and a side wing extending rearwardly from the rear end of one of said converging blades.

15. A snow plow attachment for tractors, comprising in combination a tractor, a bracket carried by said tractor, a nose portion, means for pivoting said nose portion to said bracket to swing about a vertical axis, a blade supported on each side of said tractor, means pivoting the forward end of said blades to said bracket to permit their rear ends to be adjusted toward and from each other, means for adjusting said blades, comprising a telescopic shaft carried between the upper edges of the back ends of said blades, a second telescopic shaft connected between the lower edges of the back ends of said blades, and means for adjusting the upper and lower telescopic shafts simultaneously.

16. A snow plow, comprising a support, a pair of spaced and longitudinally mounted blades, means pivoting the forward ends of said blades to said support to permit their rear ends to be adjusted toward and from each other, means for adjusting the rear ends of said blades comprising a telescopic shaft carried between the upper edges of the back ends of said blades, a second telescopic shaft connected between the lower edges of the back ends of said blades, and means for adjusting the upper and lower shafts simultaneously and at the same speeds.

17. In a snow plow, the combination of a port-

able support, a nose portion comprising diverging blades and a frame supporting said blades, means pivoting said frame to swing about a vertical axis to permit its forward end to swing laterally, a wing having its forward ends pivotally supported near the rear end of one of said blades to receive snow from the corresponding first said blade as the plow is advanced, and means for adjusting the angularity of the nose relative to said support and said wing, for the purpose stated.

18. In a snow plow attachment for tractors, the combination of a tractor, a bracket carried by said tractor, a blade supported on each side of said tractor, means pivoting the forward ends of said blades to said bracket to permit the rear ends of said blades to be adjusted toward and from each other, means for adjusting the rear ends of said blades to move toward and from each other, said means comprising a telescopic shaft connected between the upper edges of the back ends of said blades, a telescopic shaft connected between the lower edges of the back ends of said blades, and means for simultaneously adjusting said telescopic shafts longitudinally and at the same rate of speed.

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