May 7, 1929. J. M. BISING 1,711,488

SNOWPLOW

Filed April 23, 1926 4 Sheets-Sheet 1

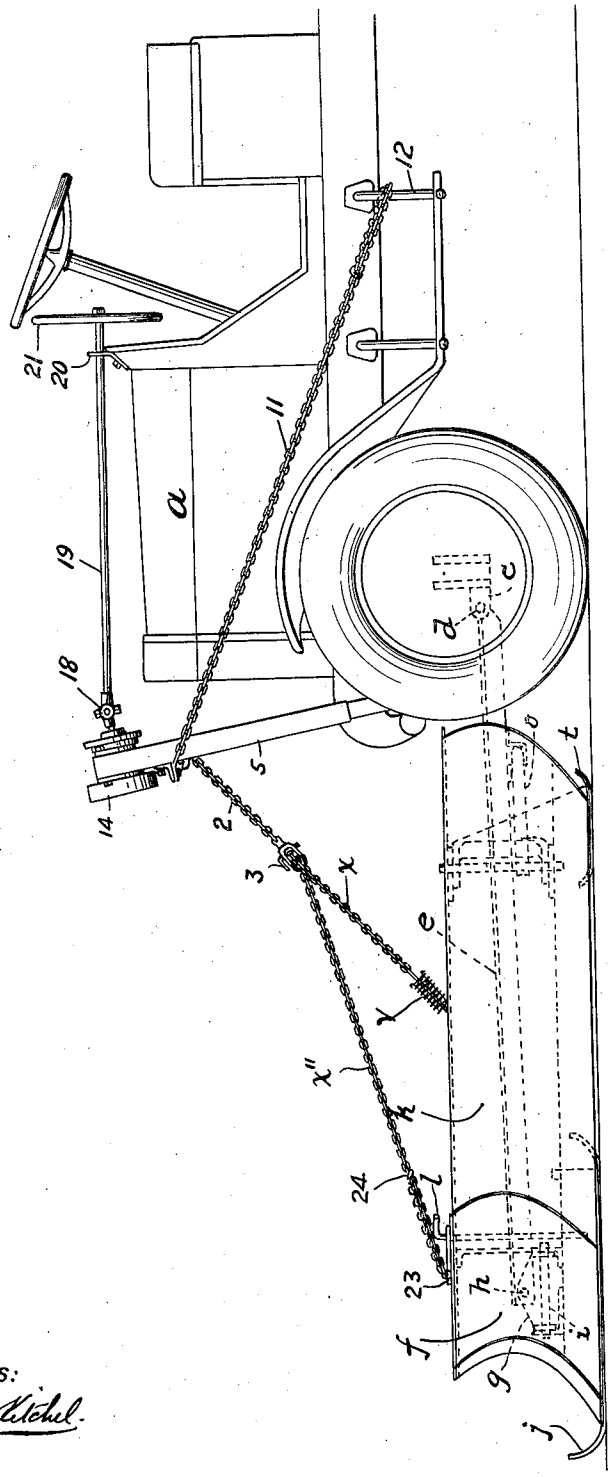


FIG. 1.

WITNESS:
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May 7, 1929. J. M. BISING 1,711,488

SNOWPLOW

Filed April 23, 1926 4 Sheets-Sheet 2

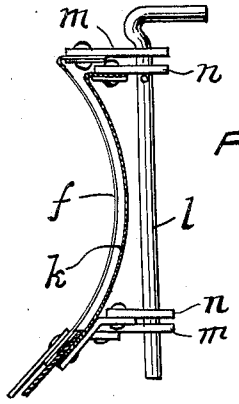


FIG. 4.

FIG. 2.

FIG. 3.

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May 7, 1929. J. M. BISING 1,711,488

SNOWPLOW

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FIG. 5.

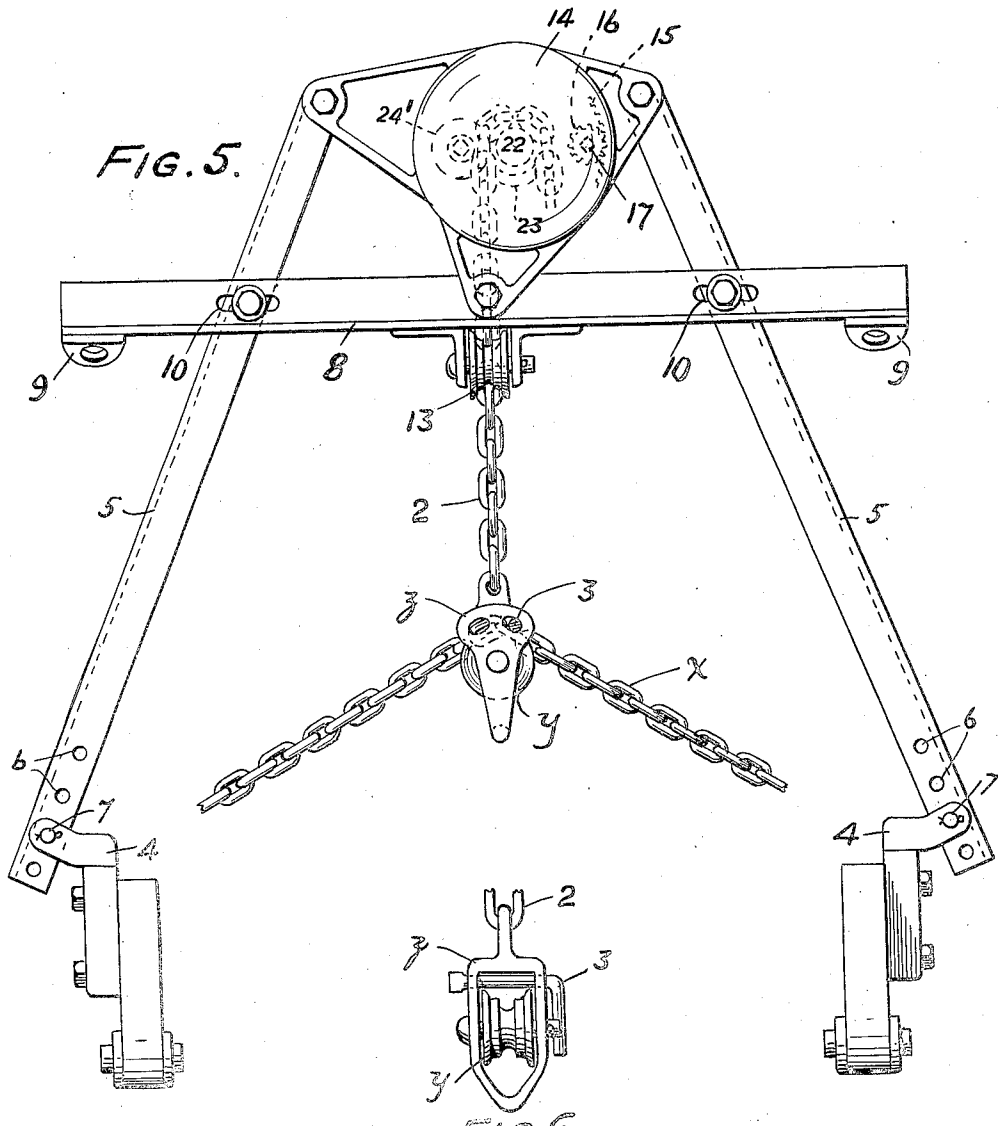


FIG. 6.

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May 7, 1929. J. M. BISING 1,711,488

SNOWPLOW

Filed April 23, 1926 4 Sheets-Sheet 4

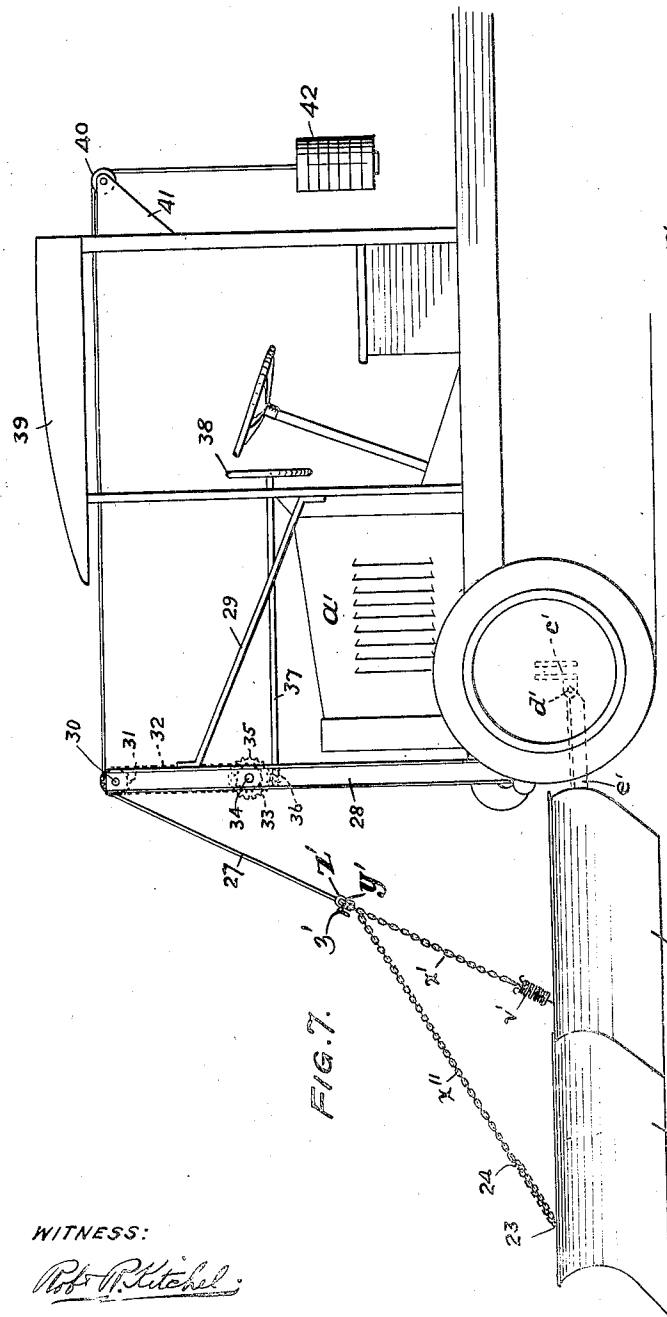


FIG. 7.

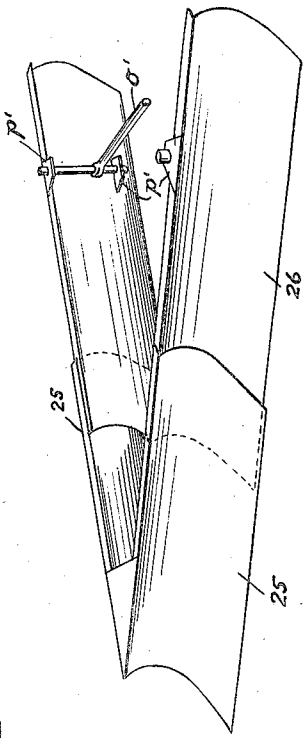


FIG. 8.

WITNESS:

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Patented May 7, 1929. 1,711,488

UNITED STATES PATENT OFFICE.

JAMES M. BISING, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO AMERICAN ROAD MACHINERY COMPANY, INC., OF KENNETT SQUARE, PENNSYLVANIA, A CORPORATION OF DELAWARE.

SNOWPLOW.

Application filed April 23, 1926. Serial No. 104,012.

My invention relates to snow plows and more particularly to snow plows of the type adapted for ready attachment to motor trucks.

Heretofore various forms of snow plows, including blade and V type plows, have been adapted for attachment to motor trucks and such plows have proved of substantial value in use in connection with the removal of snow from city streets and in maintaining highways open.

Such plows are of distinct advantage because of the fact that they do not require any special apparatus for their propulsion, being readily attached and detached from any one of the usual types of motor trucks.

In the use of such plows, speed is of paramount importance, especially in the work of maintaining highways open, which is accomplished during snow falls and the value of each plow depends upon the distance it may be made to cover efficiently.

The plows of the type indicated, as heretofore produced, while possessing substantial advantages, are not capable of any great speed in operation nor of any substantial adaptability to varying conditions, such as varying rates of snow fall, types of roads, etc., and therefor, fall far short of filling the requirements of the present increased motor traffic necessitating the maintenance of open highways and removal of snow from city streets.

Now it is the object of my invention to provide a plow of the type and for the purpose indicated, which will be of novel and greatly improved structure and which will have the capacity for operation at relatively high speed and a ready adaptability to varying conditions of service.

Having now indicated, in a general way, the nature and purpose of my invention, I will proceed to a detailed description thereof with reference to the accompanying drawings in which there has been illustrated a preferred embodiment and in which:—

Fig. 1, is a side view of a plow embodying my invention shown in operating relation with a truck.

Fig. 2, is a plan view of the plow shown in Figure 1.

Fig. 3, is a view of a detail of construction.

Fig. 4, is a section on line 4—4 of Figure 2.

Fig. 5, is a front view of hoisting apparatus.

Fig. 6, is a view of a detail.

Fig. 7, is a side view showing a modification of my invention.

Fig. 8, is a perspective view of the plow shown in Fig. 7.

Referring now more particularly to Figures 1–6 inclusive, *a* indicates a motor truck to the front axle *b* of which are clamped brackets *c* to which are pivotally secured, by means of horizontally extending pins *d*, the ends of the side members of a frame *e*, suitably cross braced and extending forwardly of the truck. The frame *e* as will be observed, may be raised and lowered relative to the ground about the pivot pins *d*.

A V shaped plow nose *f* is secured to the forward end of the frame *e* through the medium of a block *g* connected to the frame by a transverse pivot pin *h* and to the plow nose by a longitudinal pivot pin *i*. Thus the plow nose while secured to the frame may move about both transverse and longitudinal pivots and may conform to the surface over which it is propelled. Beneath the plow nose is a runner *j*.

From the ends of the sides of the plow nose *f* extend wings *k* which form a continuation of the sides of the nose. The inner ends of the wings extend behind the ends of the sides of the nose and are pivotally secured thereto through the medium of removable pins *l*, which are passed through brackets *m* and *n* secured to the sides of the nose and the wings respectively. Thus it will be noted that the wings may be readily removed or attached to the nose and that they may be adjusted at angles to the sides of the nose. In order to maintain the wings *k* in adjusted position and to brace them, struts *o* are pivotally attached at one end to brackets *p* secured adjacent the full ends of the wings and are provided with a series of holes *q* adjacent the full ends, which ends are adapted to pass through and be supported by brackets *r* secured beneath the side members of the frame *e*. The full ends are releasably secured to the frame and brackets *r* by means of pins *s* adapted to be passed through any one of the holes *q* and suitable holes formed in the side members of the

frame and brackets. Beneath the wings adjacent their full ends are positioned runners *t*.

Midway of the upper edges of the wings *k* are secured eyes *u* to which are attached, through the medium of springs *v*, which may be maintained under a set tension, the ends of a chain *x*. The chain *x* passes over a sheave *y*, the supporting frame *z* of which is engaged by one end of a chain 2. The sides of the sheave frame *z* are provided with holes for the passage of a pin 3, which when passed through the casing, as shown in Figure 6, engages the chain and acts to lock the sheave *y*, and prevent running of the chain *x*. Thus the chain *x* may be adjusted so as to have a greater length of chain between the sheave and one of the wings than between the sheave and the other wing and enable the plow to be maintained even during raising or lowering.

The plow nose *f* is provided with an eye 23 through which is adapted to be passed one end of a chain *x''*, the other end of which is secured to an extension *z'* of the sheave casing *z*. The chain is secured to the eye 23 by engagement of a hook 24 in the end of the chain with an intermediate portion of the chain, as shown in Figure 1. Thus the length of the chain from the sheave to the nose may be readily varied, permitting the nose to be adjusted upwardly or downwardly with or independently of the wings.

Secured to the forward end of the frame of the truck *a* are a pair of brackets 4 to which are adapted to be secured the ends of an **A** frame 5, each provided with a series of holes 6 through any one of which and a bracket is passed a pin 7. A cross member 8, provided with eyes 9 at its ends, is secured to the frame 5 by means of **U** bolts passing through holes 10 in the cross member, enabling it to be laterally adjusted. Chains 11 are fastened to the eyes 9 of the cross member and to, for example, running board brackets 12 of the truck and serve to brace the frame 5. Beneath the cross member 8 is secured a sheave 13 beneath which passes chain 2.

Secured to the top of the **A** frame 5 is a casing 14 within which is an internal gear 15 within which meshes a small pinion 16, mounted on a shaft 17 which extends through the rear of the casing and is connected through a sliding engagement with a universal joint 18 to a shaft 19, the rear end of which is supported by a bracket 20, mounted on the truck dash, and is provided with a hand wheel 21 for turning. The internal gear 15 is mounted on a shaft 22 which serves also to support a sprocket 23 over which passes the chain 2. It will be noted that if the pinion 16 be rotated by rotation of hand wheel 21, to which it is connected through shafts 17 and 19, the internal gear 15 and sprocket 22 will be rotated and the chain 2 drawn in or let out over the sprocket with the result that the frame *e* and attached plow may be raised up about the pivots *c* and again lowered. The ratio between the pinion 16 and the internal gear 15 is such that very little effort is required on hand wheel 21 in the raising or lowering of the plow. It will also now be noted that if in the raising of the plow it tends to twist or one of the wings tends to sag below the other, such tendency may be compensated for by varying the lengths of the portions of chain *x* between the sheave *y* and the wings respectively, which may be readily accomplished by adjusting the chain *x* on the sheave and then locking the sheave by means of the pin 3, as described.

The raising and lowering of the plow through the medium of pinion 16, though requiring very little effort on hand wheel 21, is relatively slow. In order to provide a more rapid means for raising and lowering the plow, for use when relative rapidity of manipulation is desirable, a second and larger pinion 24' is mounted, within the casing 14 in mesh with internal gear 15 on a shaft which extends out of the casing and may be connected to universal joint 18 and through the joint to shaft 19 and hand wheel 21. The larger pinion 24', it will be noted, though requiring slightly greater effort on hand wheel 21, enables greater speed in lifting and lowering of the plow.

Referring now to Figures 7 and 8, the **V** shaped plow nose 25 is secured to a frame *e'* attached through transversely extending pins *d'* to brackets *c'* clamped to the front axle of the truck *a'*. The plow 25 may be substantially similar in construction to the plow *f* except that its sides are of substantial length. Wings 26 are arranged telescopically with the sides of the plow 25 in such a manner as to enable them respectively to be extended varying distances from the ends of the sides of the plow or to be telescoped with the sides so that they will have a negligible extension.

The wings adjacent their outer ends are provided with brackets *p'* adapted for the passage of pins as mediums for pivotally securing struts *o'* to the wings. The struts *o'* act to brace the wings and are secured to the frame *e'*.

The ends of a chain *x'* are secured to the wings 26 through springs *v'*. The chain *x'* passes over a sheave *y'*, adapted to be locked by means of a pin 3', and to the casing *z'* of which is secured one end of a cable 27.

Secured to the forward end of the truck frame is a frame 28, suitably braced by means of braces 29, and having journalled in its upper end a shaft 30, upon which is

mounted a drum, around which cable 27 passes, and a sprocket 31 connected by a chain 32 with a sprocket 33 on a shaft 34, journalled in frame 28 below shaft 30 and carrying a gear 35. In mesh with gear 35 is a worm 36 on one end of a suitably supported shaft 37, on the other end of which is a hand wheel 38.

The cable 27, passing around the drum on shaft 30, extends through the truck cab 39 and over a sheave 40, mounted in a bracket 41 secured to the rear of the cab. A weight 42, of somewhat less than the weight of the plow 25, wings 26 and frame e', is secured to the end of cable 27. It will be noted that the weight 42 acts to counterbalance the plow assembly and greatly reduces the effort required, on hand wheel 38, to rotate gear 35 on shaft 34 and through chain 32, sprockets 33 and 31 to rotate shaft 30 and the sheave thereon, over which cable 27 passes, to raise and lower the plow.

It will now be noted that in accordance with my invention a plow of great efficiency and adaptability is provided and one which is capable of ready adjustability and high speed in service.

It will also be noted that the plow in accordance with my invention is capable of adjustability for the exigencies of varying types of service and various types and widths of roads without any sacrifice of efficiency.

It will be understood that in describing the specific embodiment of my invention shown in Figures 1–6 and the modification shown in Figures 7 and 8, I do not intend that my invention shall be limited to specific details of construction, and it will be further understood that when in the specification and claims I refer to a motor truck, that I intend to include any other vehicular means for propelling the plow, as for example, a tractor.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:—

1. In a snow plow in combination, a frame adapted to be pivotally secured at one end to a motor truck, and a plow secured to the other end of said frame on pivots extending transversely and longitudinally of the frame.

2. In a snow plow in combination, a frame adapted to be pivotally secured at one end to a motor truck, a plow secured to the other end of said frame on pivots extending transversely and longitudinally of the frame and wings adapted for extension beyond the ends of said plow.

3. In a snow plow in combination, a frame adapted to be pivotally secured at one end to a motor truck, a plow secured to the other end of said frame on pivots extending transversely and longitudinally of the frame, wings adapted for extension beyond the ends of said plow and adjustable angularly with respect to the sides thereof and means pivotally secured to said wings and said frame for retaining said wings in adjusted position.

4. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame, a hoisting device, flexible means extending from said hoisting device, a second flexible means connected to said plow and connecting means affording a connection between said first flexible means, said connecting means being adapted to permit the second flexible means connected to the plow to run or to hold said second flexible means.

5. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame, a hoisting device, a sheave connected to said hoisting device, flexible means passing over said sheave and connected to said plow and means for locking said flexible means with respect to said sheave.

6. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame, wings in association with said plow and adapted to form extensions of the sides thereof, a hoisting device, a sheave connected to said hoisting device, flexible means passing over said sheave and secured to said wings and means to lock the flexible means with respect to said sheave.

7. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame, wings in association with said plow and adapted to form extensions of the sides thereof, a hoisting device, a sheave connected to said hoisting device, a chain passing over said sheave and secured to said wings and means engaging said chain and adapted to lock the chain with respect to said sheave.

8. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to the frame by a universal connection, a hoisting device adapted to be mounted on said motor truck, including a pinion and gear and a rotatable member associated with said gear, flexible means in association with said rotatable member having three extensions connected to said plow and means for rotating said pinion to effect a raising and lowering of said plow.

9. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame by a universal connection, a hoisting device including a pinion and gear and a sprocket associated with said gear adapted to be mounted on said motor truck, a chain passing over said sprocket, means affording three connec-

tions between said chain and said plow and means for rotating said pinion.

10. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame, a hoisting device including a pinion and gear and a sprocket associated with said gear adapted to be mounted on said motor truck, a chain passing over said sprocket, a sheave supported by said chain, a second chain passing over said sheave and connected at its ends to said plow, means for locking said chain with respect to said sheave and means for rotating said pinion.

11. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame on transverse and longitudinal pivots, a hoisting device adapted to be mounted on said motor truck, flexible connections between said plow and hoisting device and means in said connections adapted to compensate said connections to prevent twisting of the plow when raised by the hoisting device.

12. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow connected to said frame, a hoisting device including a pinion and gear and a sprocket associated with said gear adapted to be mounted on said motor truck, a chain passing over said sprocket, wings extending from said plow, means for bracing the wings from said frame, means affording adjustable connections between said chain and said wings respectively and means for rotating said pinion.

13. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow nose connected to said frame, wings in association with said plow and adapted to form extensions of the sides thereof, a hoisting device, a sheave connected to said hoisting device, a chain passing over said sheave and secured to said wings and a second chain connected to said plow nose and to said hoisting device.

14. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow nose connected to said frame, wings in association with said plow and adapted to form extensions of the sides thereof, a hoisting device, a sheave connected to said hoisting device, a chain passing over said sheave and secured to said wings and a second chain adjustably connected to said plow nose and connected to said hoisting device.

15. In a snow plow in combination, a frame adapted to be pivotally connected to a motor truck, a plow nose connected to said frame, wings in association with said plow and adapted to form extensions of the sides thereof, a hoisting device, a sheave connected to said hoisting device, a chain passing over said sheave and secured to said wings, an eye secured to said plow nose and a chain passing through said eye and attached to said hoisting device.

In testimony of which invention I have hereunto set my hand, at Kennett Square, Pennsylvania, on this 13th day of April, 1926.

JAMES M. BISING.