Feb. 12, 1929. 1,701,979

H. H. LINN

SNOWPLOW

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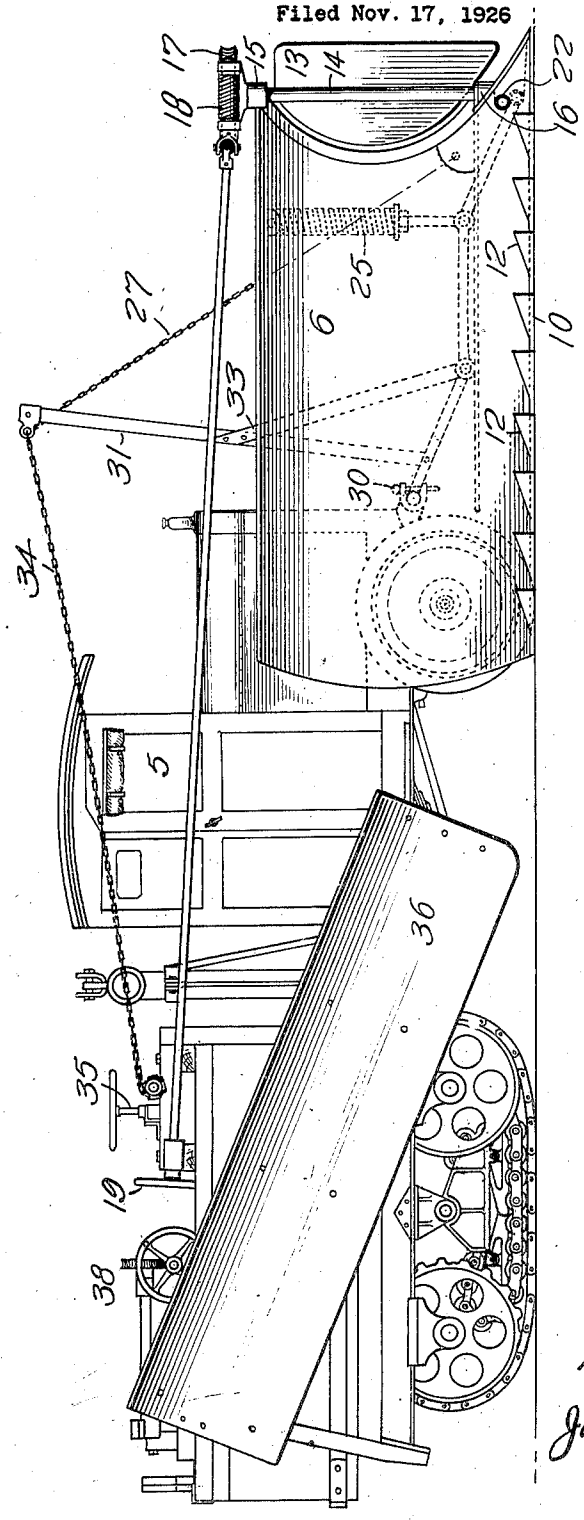


Fig. 1.

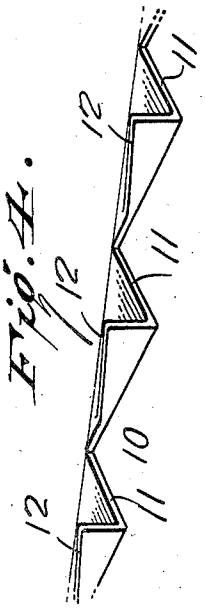


Fig. 4.

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Fig. 2.

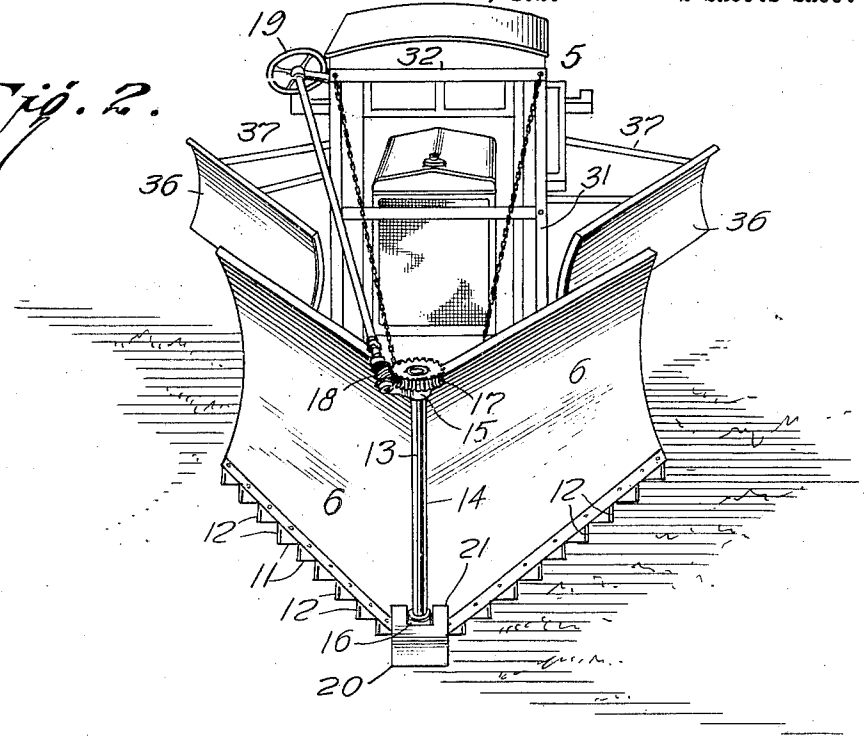
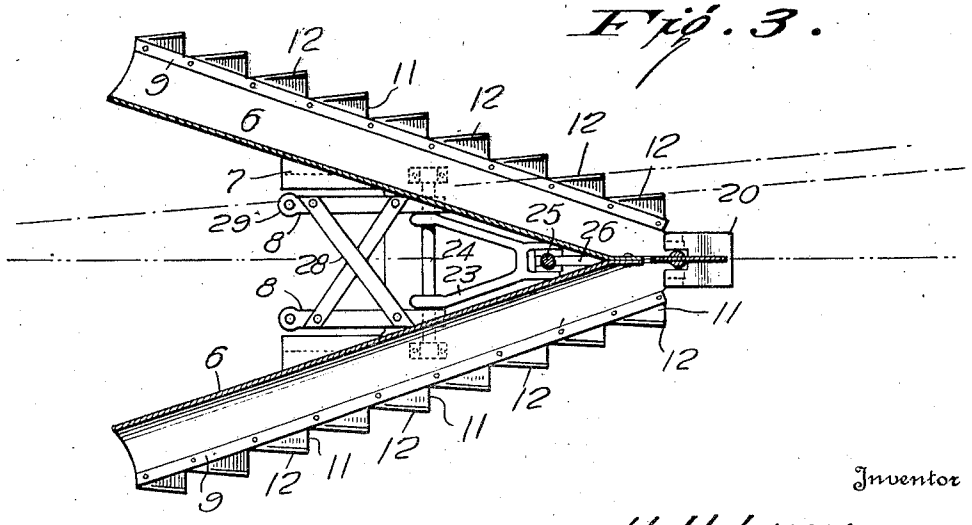


Fig. 3.



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Patented Feb. 12, 1929. 1,701,979

UNITED STATES PATENT OFFICE.

HOLMAN HARRY LINN, OF MORRIS, NEW YORK, ASSIGNOR TO THE LINN MANUFACTURING CORPORATION, OF MORRIS, NEW YORK, A CORPORATION OF NEW YORK.

SNOWPLOW.

Application filed November 17, 1926. Serial No. 148,852.

The invention relates more particularly to apparatus mainly intended for operation with heavy duty tractors for clearing snow from public highways and the like and in general the nature of the invention consists in certain improvements in snow plows of the V divider type.

Principal objects are to provide for operating on snow deposits and drifts in a more rational and, hence, more efficient and expeditious way than has been possible heretofore; to provide for easing the plow directly into drifts and banks by a novel system of rudder equipment controlled, for example, from the tractor body; to provide cutting elements ranging the effective length of the mould boards and characterized by upstanding receding lips set with a pronounced rake so as to "hog in" to ice or hard packed snow; to provide a cushioned point or pilot cutter of shock-resisting material and so designed, constructed and arranged that upon contact with, for example, a track rail or other refractory obstruction it will yield and so avoid damage to itself or to the assembly; to provide for ruggedly mounting the parts with respect to the tractor, including provisions for elevating the plow, and provisions for independently operating the point or pilot cutter; and to provide after or widening wings susceptible of variable adjustment whereby in conjunction with the plow they are capable of clearing a path substantially twenty feet in width.

Other objects as well as the nature, characteristic features and scope of the invention will more readily be understood from the following description taken in connection with the accompanying drawings, forming a part hereof, wherein,—

Figure 1 is a side elevational view of snow fighting equipment embodying features of the invention.

Fig. 2 is a front elevational view.

Fig. 3 is a plan partly in section.

Fig. 4 is a perspective view of the cutting lips.

In the drawings, 5 is a standard heavy duty tractor of the crawler type. The particular machine represented is the Linn tractor.

According to my invention, the reversely curved mould boards 6 are angularly disposed and joined to form a plow of the conventional V divider type. A sub-frame 7 constitutes a stiffening provision and also means for accommodating the pusher bars 8 which latter are appropriately carried by the tractor.

The bottom of the plow is relatively close to the ground and normally parallel therewith and is equipped throughout its effective length with cutting elements which may be of integral strip form or for simplicity and economy of replacement of separate unit form, the bottom margins of the mould boards, in either event being appropriately stiffened or reinforced as by the provision of wear plates 9.

As premised, an important object and merit of the invention is the provision of a cutter which will "hog in" to ice or hard snow. And this is exemplified in a construction which will present a straight edge cutting front and an upstanding flange or cutter inclined rearwardly and disposed out of parallel with respect to the longitudinal axis of the plow in order to establish the necessary rake characteristic essential to the purpose for which it was designed. Such construction, by preference, is embodied in the cutting elements 10 having straight edge cutting fronts 11 and upstanding marginal cutting lips 12 which incline rearwardly to or substantially to the vanishing point and are further characterized by the fact that they extend inwardly or out of parallelism with the main axis of the plow. It will be observed that the back terminal or vanishing point of the respective lips 12 stops short of the front lip of the next adjacent cutter. The effect of this coupled with the rearward slant and rake of the upstanding lips and the general offsetting or staggered arrangement of the cutters makes each cutter self-cleaning in the sense that it will not pack.

It will be apparent that the described construction and arrangement makes for a multiple loosening, slicing and lifting action which is distributed over a wide range and greatly facilitates the maneuvering of the machine to enable it to attack drift. And this brings us to another merit of the invention for by the inclusion of cutting elements of the nature stated which go into action progressively I am enabled to further advance my inventive thought by the inclusion of a dirigible element for the plow.

For this purpose the prow of the V divider is inwardly bowed to accommodate a rudder 13 mounted on a rudder stock 14. The latter is turnable in top and bottom bearings 15 and 16, for example, through the agency of a worm wheel 17 and worm shaft 18, whereof the latter extends to the tractor body and is equipped with a hand wheel 19.

In the further accomplishment of my inventive thought, I provide a flexibly mounted plow share or point 20 ranging forwardly of the plow and which in fact constitutes a pilot cutter. By preference it is a heat-treated casting of manganese steel or other shock-resisting metal of substantially wedge form having a rearwardly opening slot or recess to accommodate the rudder stock and to provide arms 21 whereby it may be afforded a hinge mounting, as at 22, with relation to the plow. The purpose of this is to enable the pilot cutter to yield downwardly and rearwardly upon encountering refractory objects such as track rails, boulders, manhole covers, curbs, etc. In the further advancement of this thought, means are provided for normally holding the pilot cutter in its regular position, but which will operate as a cushion in any instance of the emergency stated and automatically return the pilot cutter to its normal position after it has overcome the emergency. For example, the pilot cutter may be held in position by a toggle lever 23 mounted for swinging movement on a cross shaft 24, and carrying a spring-pressed rod 25, the spring tending to hold the toggle in a horizontal plane, and the toggle controlling the position of the pilot cutter through the medium of a link connection 26. The pilot cutter is also susceptible of manual operation through a connection 27 extending to the tractor body whereby it may be swung on its pivot in order, for example, to return it to normal position after encounter with a refractory object.

The push bars are joined by diagonal struts or braces 28 and at their forward ends are pivotally mounted on the cross shaft 24. Their rear ends have eyes 29 whereby they may be flexibly coupled to the tractor frame as by coupling pins 30. The rigid frame thus provided by the push bars affords an efficient means for elevating the plow. This result may be accomplished through the medium of elevating rods 31, which range upwardly from the push bars, are joined at top by a cross bar 32, and are braced as at 33. The elevating rods may be manipulated by a chain 34, extending from the cross tree to a winch 35. The cross tree may also carry the chain or connection 27 leading to the pilot cutter.

The full equipment includes after wings 36 whose office is to widen the path made by the plow. The end mountings 37 are of flexible character and admit of considerable wing spread and they are under the control of suitable gearing 38 so that the wings may be quickly drawn inward and upward to enable the machine to negotiate narrow bridges and thoroughfares.

It will be manifest to those skilled in the art that various changes and modifications may be made within the scope of the following claims.

Having described my invention, I claim—

1. A snow plow comprising, in combination, a rudder and its complemental control, a pilot cutter, and main cutting elements having horizontal straight edge cutting lips interrupted by upstanding rearwardly directed flanges forming vertical cutters, said cutters receding rearwardly to substantially a vanishing point and having a decided rake whereby the cutting stages are self-cleaning.

2. A snow plow comprising, in combination, a rudder and its complemental control, a spring-pressed pilot cutter, and means for supporting said elements, said means equipped its effective length with main cutting elements having horizontal straight edge cutting lips interrupted by upstanding rearwardly directed flanges forming vertical cutters, said cutters receding rearwardly to substantially a vanishing point and having a decided rake whereby the cutting stages are self-cleaning.

3. A snow plow comprising, in combination, a main frame including mould boards, a rudder accommodated in the depressed front of the frame, worm gear for operating it, a pilot cutter mounted to yield on contact with refractory objects, and self-cleaning cutters at the base of and ranging the effective length of the mould boards.

4. A snow plow comprising, in combination, a main frame including mould boards, a spring-pressed system of toggle levers mounted between the mould boards, a pilot cutter operatively connected therewith, and main cutters flanking the pilot cutter.

In testimony whereof I affix my signature.

HOLMAN HARRY LINN.