July 18, 1933. E. B. MEYER 1,918,771

SNOWPLOW

Filed April 16, 1929

FIG.1.

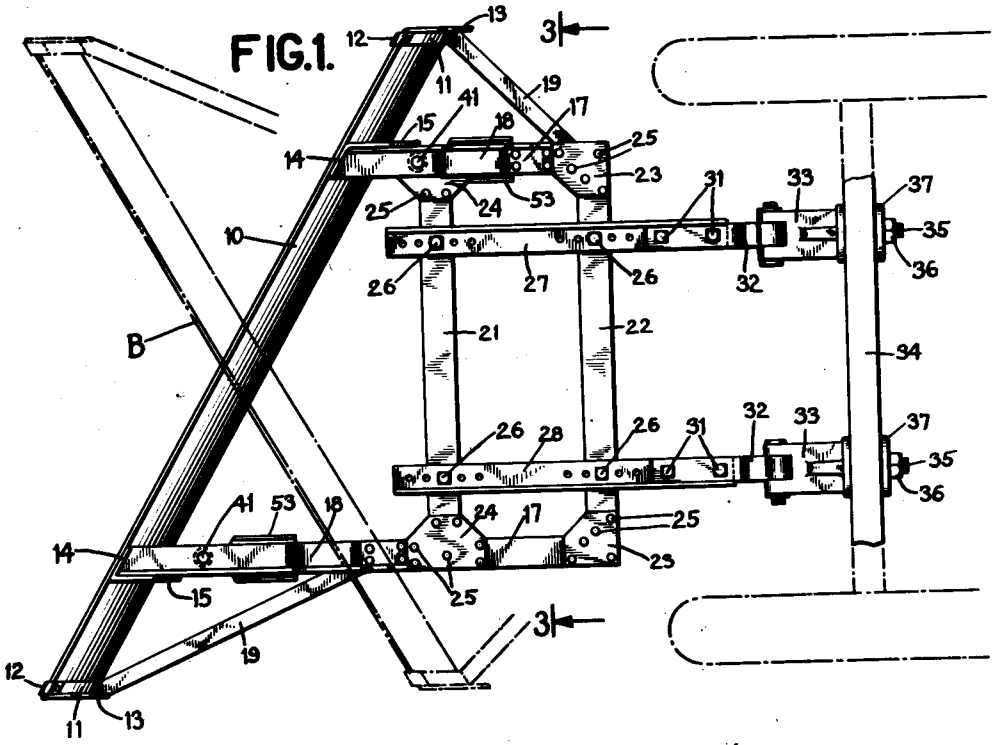


FIG.2.

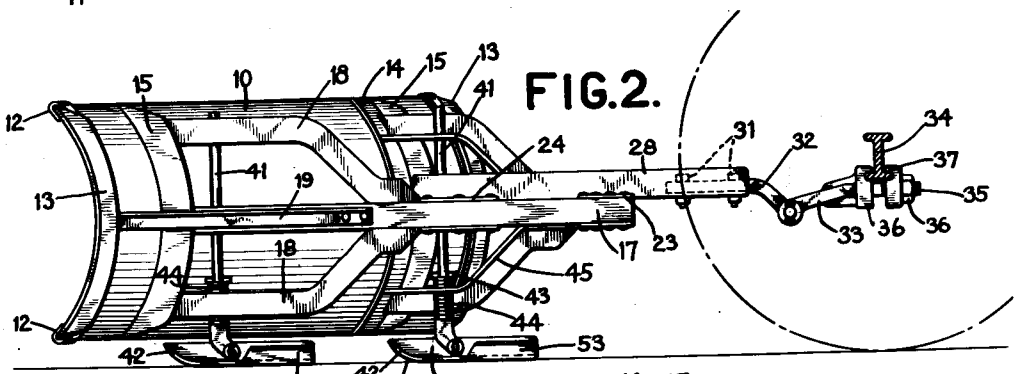


FIG.3.

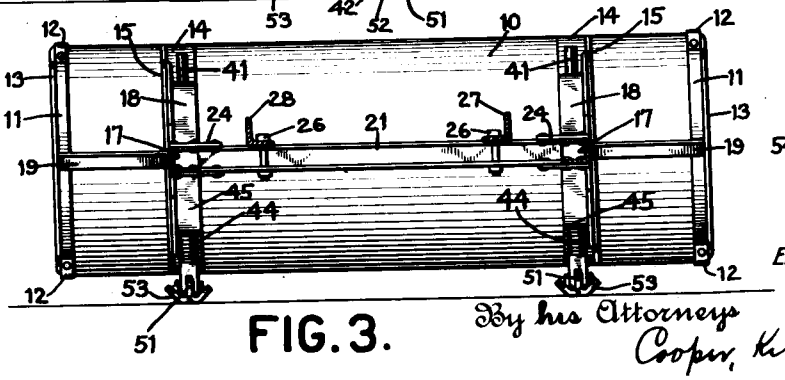
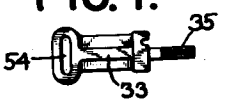


FIG.4.



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UNITED STATES PATENT OFFICE

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SNOWPLOW

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This invention relates to snow plows and has particular reference to snow plows of the kind which are adapted to be attached to and operated by an automobile.

One object of the invention is to provide an apparatus of the kind mentioned which can readily be connected to and disconnected from an automobile and which is so constructed as to clear a path extending substantially the full width of the automobile by moving the snow to one side only without throwing injurious lateral strains upon the automobile.

Another object is to provide a construction which will permit reversing the part which is, for convenience, usually referred to herein as the blade, so as to deflect the snow to one side or the other according to requirements.

Still another object of the invention is to provide improved devices for supporting the plow comprising new and more satisfactory ground engaging devices.

With the foregoing and other objects in view the invention consists in a novel construction and combination of parts, the essential features of which are set forth in appended claims, and a preferred form of embodiment which is hereinafter described with reference to the drawing which accompanies and forms a part of the specification.

In said drawing:

Fig. 1 is a top plan view of the apparatus assembled to throw the snow to the right hand side of an automobile, with the position of the blade shown reversed in dotted outline.

Fig. 2 is a left side elevation of the apparatus.

Fig. 3 is a view on the line 3—3 of Fig. 1.

Fig. 4 shows a modified form of one of the elements used for connecting the snow plow to the automobile.

Stated in general terms the apparatus of the drawing is so constructed as to produce a rolling movement of the snow at an angle to the path of the vehicle, this rolling movement resulting in the snow being deflected finally to one side. The movement of the snow mentioned results from the fact that the blade presents a concave surface to the snow and has its upper and lower edges in approximately the same vertical plane, coupled with the further fact that the blade is held at a somewhat obtuse angle to the line of movement of the automobile. This construction has proven to be very efficient in moving the snow to one side without throwing any injurious lateral strains upon the automobile or the connections between it and the plow.

The apparatus is so constructed that it can be readily changed to cause it to throw the snow to one side or the other as desired. This feature readily adapts it to work in any particular surroundings, particularly in clearing a road at the foot of a hill or around a wall. In order to make the plow reversible the supporting framework is so constructed as to provide portions of unequal length extending rearward substantially on a line with the middle of the blade and provided with bolt holes which may be used to attach the plow and its frame to the vehicle with the blade in either of its two angular positions. It has been found that the best results have been effected by having the blade in either of its two positions at an angle of seventy to seventy-five degrees to the line of travel of the vehicle.

The blade and its connected framework are supported on runners or shoes of a novel construction. The shoes are pivoted to the ends of the rods which are journaled in the framework and held in position by cotter pins or corresponding devices. When it is desired to reverse the blade or turn it over to its other angular position the cotter pins are removed and the rods turned end for end and then inserted from the other side of the framework. The rods are each supplied with a number of washers which may be so arranged with reference to the runners and the supporting frame work as to provide a convenient way of regulating the height of the blade with reference to the ground.

Describing the illustrative form of the apparatus shown in the drawing, the blade 10 is preferably formed of a single sheet of metal long enough to clear the snow from a path substantially the width of an automobile. It is curved along its face so as to present a concave surface to the snow and when in assembled position the upper and lower

edges of the blade are preferably in nearly the same vertical plane. Each of the ends of the blade is reinforced by a strip 11 of metal riveted or otherwise attached to the blade and having its ends turned over the blade as shown at 12 to protect the corners. Integral with each strip 11 is a wing or fin 13 projecting rearward and serving further to stiffen and strengthen the ends of the blade.

Attached to the rear side of the blade are two angle irons 14 curved to the shape of the blade and serving through their rearwardly extending portions 15 to stiffen the blade and also afford points of attachment for members of the framework.

The framework referred to comprises a channel bar 17 at each side of the apparatus, one of the bars being, as shown, longer than the other. The forward ends of the channel bars are attached to the portions 15 of the angle irons 14. Attached to the channel irons or bars 17 are brace members 18 having their forward ends secured either to the angle irons 14 or to the portions 15 thereof. It will be noted from the drawing that the channel bars 17 are so attached as to project rearward from the blade 10 at the middle of the blade and that the upper and lower braces 18 of each pair are alike. The blade 10 is additionally reinforced or braced by angle irons 19 attached at their ends to the channel bars 17 and either to the reinforcing strips 11 or the flanges 13.

Extending between the channel irons or bars 17 are cross members or channel irons 21 and 22. The connection between the members 21 and 22 and the bars 17 is preferably effected by using plates such as are shown at 23 and 24 and the necessary rivets 25 for securing the parts together. At intermediate points the members 21 and 22 are provided with bolt holes which accommodate the necessary bolts 26 for securing the members 21 and 22 to angle irons 27 and 28. Both of these channel irons may have a number of bolt holes not shown but which may be disposed laterally of the angle irons 27 and 28 to permit of a certain amount of variation in assembling the parts.

The angle irons 27 and 28 are also provided with bolt holes to receive bolts designated generally as 31 for connecting the angle irons to members 32. Each member 32 is pivoted between jaws on a member 33 forming part of the clamp used for connecting the apparatus to the front axle 34 of an automobile. Embedded in the member 33 or extending therefrom is a threaded rod 35 carrying a nut 36 for drawing the other member 37 of the clamp into engagement with the axle.

Preferably the member 32 when in the position illustrated has a downwardly rearwardly extending portion, and preferably the member 33 when in the position illustrated has a downwardly forwardly inclined portion, these portions being pivotally connected together by pins on a transverse horizontal axis, as generally illustrated. By detaching the member 32 at 31, it may be turned upside down and reattached, and thus may adjustably vary the height of the pin pivot connection. Similarly, by means of the bolt 35 and nut 36, the members 36 and 37 may be detached and turned upside down and reattached to the axle 34, correspondingly adjustably changing the height of the pin pivot connection. Thus, by changing the position of one or both of the members 33 and 32, four different adjustment elevations of the pivot connection may be effected.

The channel irons 17 and the braces 18 are all provided with apertures to receive rods 41 having runners or shoes 42 pivoted to their ends. The rods are normally held against removal by cotter pins 43. On each of the rods is a set of washers 44, varying numbers of which may be placed below the laterally extending rib 45 on one of the braces 18 to regulate the height at which the blade 10 is held from the ground.

If the parts are in the positions shown in full lines in Fig. 1 and it is desired to reverse the plow so as to deflect the snow in the opposite direction the cotter pins 43 are removed and the rods 41 with their connected runners or shoes 42 removed and inserted from the other side of the framework so as to support the plow blade properly in its altered position. The bolts 26 are also removed and after the blade, and the frame members rigid therewith, have been turned over, the angle irons 27 and 28 are again placed on top of the cross members 21 and 22 and the bolts 26 again applied. The blade 10 will then be held in the position indicated by the dotted outline B in Fig. 1 of the drawing.

As an alternative mode of operation, to turn the plow blade upside down to change its angular position, the pins between the members 32 and 33 may be removed, the bolts 26 being maintained in engaged condition and the entire framework including the members 27 and 28 and the members 32 may be turned upside down and the pins reinserted. If the center line of the pin is approximately on a horizontal line with the center line of the plow blade, then when the rods 41 have been withdrawn and reinserted in the other side of the frame, as has been described, they can be adjusted as formerly and will support the plow in its reversed position correctly with respect to the ground. However, it is not essential that the pins be on the center line when the turning-over operation is performed in this manner. If they are not on the center the plow blade will be presented to the snow slightly out of the general vertical position, but only slightly and will

not materially affect its operation, and even this slight change may be compensated for by readjusting the rods 41 concurrently with their withdrawal and reinsertion on the other side of the frame.

Each of the shoes 42 has a central longitudinal rib 51 extending between jaws at the ends of the rods 41 and laterally extending portions 52 giving a rather wide flat front to the runner. Extending from the rearward portions of the shoe are two upwardly and outwardly inclined portions 53 which facilitate the turning of the plow and particularly so when getting out of ruts.

The device shown in Fig. 4 is intended to be substituted where necessary for the member 33 of the clamping device previously described. It varies from the other construction mainly in having a slot 54 to receive the pivot pin, the purpose of the slot being to permit a vertical movement of the pin, and, of course, the element 32 of the connection, thereby allowing the plow to ride over a sharp ridge or curve and still have the lower edge of the blade 10 near enough the ground to serve its intended purpose.

In constructing the plow the various frame members are preferably made of light gauge material, but are constructed of channel and angle irons so as to give the necessary strength and rigidity for satisfactory results.

While the construction shown and described is admirably adapted for the objects and purposes stated, it is apparent that the invention is capable of various embodiments coming within the scope of the claims which follow.

What is claimed is:

1. A snow plow structure for motor vehicles, comprising a double edged snow engaging blade element, a propelling frame connected forwardly to the blade and rearwardly having means for connection to a motor vehicle, the blade presenting one edge to the ground and transversely of the frame and at an angle to the direction of progress of the vehicle, to throw the snow to one side of the vehicle path, the frame being adapted to be disconnected from the vehicle and turned upside down and reconnected thereto to present the other edge to the ground and to throw the snow to the other side, the frame having a plurality of rotational bearing means axially vertically disposed, a stem rotatably mounted in each bearing means, and engaging the frame, a ground-engaging means on the stem for supporting the weight of the blade and means associated with the stem and frame to adjust the height of the blade above the ground and the stems being adapted to be mounted in the bearings in either of opposite directions optionally to optionally support either edge of the blade.

2. In a snow plow attachment for motor vehicles, a snow plowing blade, a frame connected to the blade and adapted to be propellingly connected to a motor vehicle, supporting means for the frame to support it in predetermined relation to the ground, comprising a ground engaging element, a vertically adjustable element connected to the ground engaging element and having telescopic engagement with a member of the frame, a set of spacers on the vertically adjustable element on each side of the frame member and a stop on the vertically adjustable element for each set of spacers.

3. In a snow plow attachment for motor vehicles, a snow plowing blade, a frame connected to the blade and adapted to be propellingly connected to a motor vehicle, supporting means for the fr me to support it in predetermined relation to the ground, comprising a ground engageable element, a stem therefor vertically adjustable and rotatable in a perforation in a frame element, adjusting washers on the stem in two groups on each side of the perforation and a stop on the stem for each group of washers.

4. In a snow plow mechanism for motor vehicles, a frame, a two-edged snow plow blade, disposed at an angle to the line of travel of the vehicle, to throw the snow to one side of the vehicle path, and to present one edge to the ground, means connecting the frame to the vehicle, whereby the blade and frame may be turned upside down to present the other edge to the ground and to throw the snow to the other side, a ground support for the frame comprising a ground engageable element, a carrier therefor mounted in the frame and adapted to be removed therefrom and reversely mounted therein to reverse the position of the ground engaging element to support the frame in its upside down position.

5. A reversible snow plow attachment for motor vehicles comprising a blade having a single concave snow engaging face, a supporting and reinforcing framework rigid with the blade and including two bars extending rearward from a horizontal line along the middle of the blade, one of said bars being longer than the other, means including horizontally pivoted members for detachably connecting said bars to the vehicle with either edge of the blade nearest the ground, rods removably journaled in the aforesaid framework and adapted to be reversed when the blade is reversed, and a runner pivoted on one end of each rod.

6. A reversible snow plow attachment for motor vehicles comprising a blade having a single concave snow engaging face, a supporting and reinforcing framework rigid with the blade and including two bars extending rearward from a horizontal line along the middle of the blade, one of said bars being longer than the other, means in-

cluding horizontally pivoted members for detachably connecting said bars to the vehicle with either edge of the blade nearest the ground, rods removably journaled in the aforesaid framework and reversible end for end in said framework when the blade is reversed, a runner pivoted on one end of each rod, and a set of washers on each rod cooperating with a portion of the framework and changeable with reference to said portion to adjust the height of the blade from the ground.

7. A snow plow attachment for motor vehicles, comprising a snow engaging member and a supporting and reenforcing framework therefor, means pivotally connecting the framework to the vehicle on a horizontal transverse axis, ground engaging runners, vertical castering shafts journalled in the framework pivotally connected by transverse horizontal pivots to the runners, the shafts being vertically adjustable in the framework to adjust the position of the snow engaging member relative to the ground, and means to adjust the shafts comprising bearing supports in the frame for the shafts, stops on the shafts on each side of the bearing supports and spacers on the shafts between the stops and the bearing supports.

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