

Nov. 24, 1936.

E. B. MEYER

2,061,585

TRACK CLEARING IMPLEMENT

Filed April 2, 1935

2 Sheets-Sheet 1

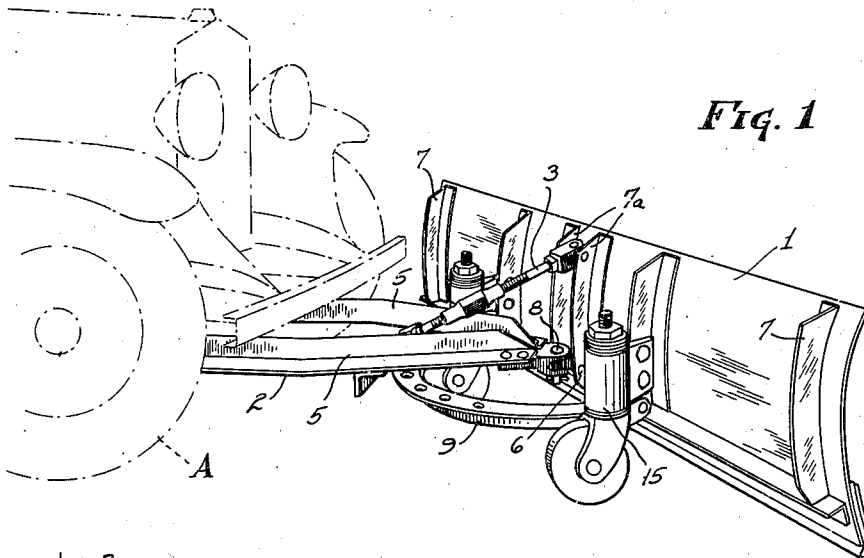


Fig. 1

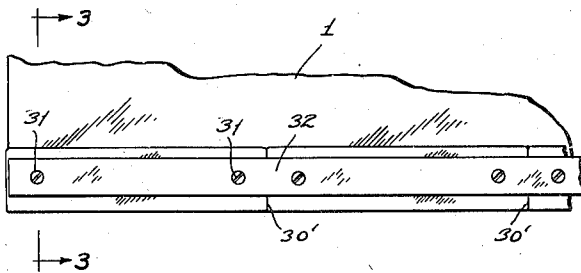


Fig. 2

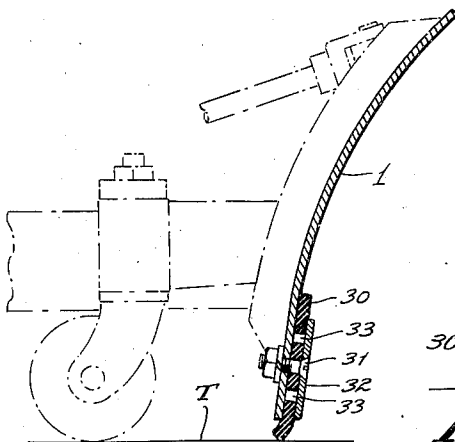


Fig. 3

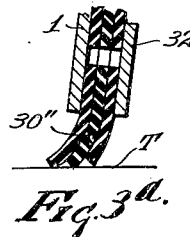
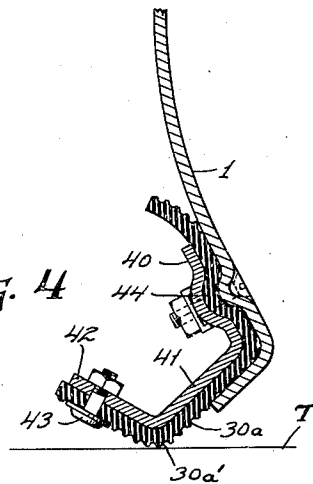


Fig. 3a.

Fig. 4



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2 Sheets-Sheet 2

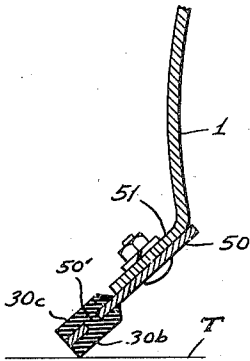


Fig. 5

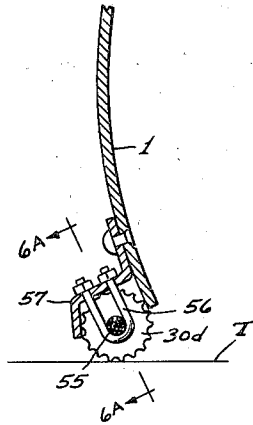


Fig. 6

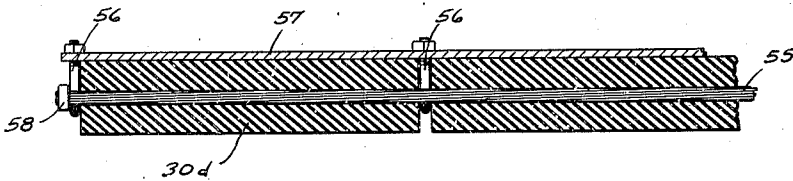


Fig. 6A

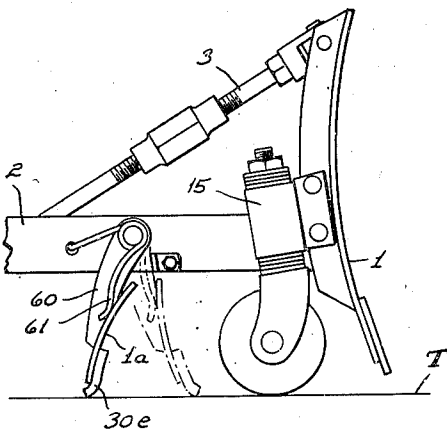


Fig. 7

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2,061,585

TRACK-CLEARING IMPLEMENT

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Application April 2, 1935, Serial No. 14,313

12 Claims. (Cl. 37-42)

One object of this invention is to provide an improved track-clearing implement of the class adapted to be shoved or pulled by a suitable traction vehicle. The invention further embraces a new method and apparatus for clearing accumulations of snow and slush from generally planar surfaces, the operation of which will be relatively silent and result in substantially completely clearing the track, irrespective of the depth of accumulation, within reasonable limits.

A further object is the provision of an apparatus adapted for use with a power-driven track-clearing implement, which will yieldingly wipe the track surface substantially clear of foreign matter, such as slush and water, which lie too close to the surface to be effectively removed by conventional mold-boards and devices commonly used for moving snow, and which will simultaneously operate to move the foreign matter clear of the track.

A specific object is the provision of a track-clearing implement which will operate without the use of rotary brushes, e. g. or other mechanisms requiring special power drive, to entirely clear a pavement or sidewalk surface of snow and slush, and which will be practically silent in operation.

A further object is the provision of a track-cleaning apparatus which may be operated in direct contact with the track surface in a manner to leave a substantially clean track, yet with substantially minimum wear, notwithstanding the naturally abrasive character of most track surfaces requiring clearing, and which will operate with no likelihood of injuring the track surface.

A specific object is to provide a snow plow or shovel of the class shown, which, when used to move wet snow or slush, will substantially dry, as well as clear the track surface.

Another object is to provide a snow plow blade which will be automatic in its action in riding over projections on the trackway and returning to the normal trackway surface,—all without the use of springs and hinge connections, and without requiring that any more of the track-contacting element of the implement than a portion the width of the projection shall leave the track surface.

Other objects include the provision of a tough and wear-resisting elastic track-contacting element for a snow plow or shovel or track clearing implement of substantially any kind adapted for power drive and having a mold-board, which element will operate effectively with the mold-board disposed at any angle to the direction of move-

ment and at substantially any operating angle with reference to the track; which may be adjustably supported on the plow or shovel, so that the working surface or edge of the element may be easily and quickly changed in operative effect and renewed whenever necessary on account of wear, etc.; which is or may be suitably reinforced to strengthen it or extend its useful life, and which will be self-adjusting for reverse movement, i. e. backing up, notwithstanding normal disposition such that, if rigid, the track-engaging portion of the implement would have to be raised clear of the track in order to avoid damage either to the track or to the implement during such reverse movement.

Other objects and features of the invention will become apparent from the following description, relating to the accompanying drawings. The essential characteristics are summarized in the claims.

In the drawings, Fig. 1 is a perspective view, showing a suitable type of mold-board and support, and the cooperative relationship with the mold-board of the new arrangement hereof in one form; Fig. 2 is a fragmentary front elevation of the arrangement shown in Fig. 1; Figs. 3 to 6 are transverse sectional views of the lower portions of mold-boards equipped with various different embodiments of the invention; Fig. 3a is a view similar to Fig. 3 of a modified form of the arrangement thereof; Fig. 6a is a fragmentary view of the track-contacting element, shown in Fig. 6, and Fig. 7 is a side elevation showing the new device separate from the main mold-board element of the implement but having a mold-board element of its own.

Referring to Figs. 1 and 2, 1 indicates the mold-board and 2 a suitable pusher and supporting frame therefor with an adjustable strut 3, connecting the frame with the upper portions of the mold-board so as to rigidly brace the latter while permitting the forward inclination of the mold board to be adjusted in suitable fashion. The mold-board may be of any suitable shape.

While the supporting frame illustrated is of the pusher type, whereby the mold-board may be attached to a traction vehicle such as an automobile truck or tractor, ahead of the front wheels, this is not essential to the present arrangement. The mold-board may be positioned at any other point with respect to the vehicle, viz. drawn behind or located between the front and rear sets of wheels. The improvement is applicable to any type of mold-board and/or support therefor.

The pusher frame may comprise spaced bars

5 connected at their forward portions as by a pivot 6, with the bracing structure of the main mold-board, upright angles 7, as shown. A pair of these 1a support, between them, the pivot of the bars 5 and the strut 3, as shown. The connections between the pusher bars and the mold-board also include a vertical pivot shown at 8, so that the angle of the mold-board may be adjusted with reference to the track surface, a sector bar 9 being shown riding under the bars 5 and secured thereto by conventional means for holding the mold-board at the desired angle.

Conventional vertically adjustable caster supports are shown at 15, preferably holding the lower rigid edge of the mold-board spaced a short distance from the track surface. Skids may be used instead of roller casters, and any suitable hoist, not shown, may be used for the purpose of suspending the mold-board in proper elevation above the trackway for operation and carrying when idle.

The connection between the frame 2 and the traction unit A (only the wheels and bumper being indicated) may comprise any suitable arrangement, preferably including a horizontal pivot and clamps (not shown)—see, for example, my Patent 1,925,397, issued September 5th, 1933. The above described implement is only by way of an example of one form, the utility of which is affected by the essential improvement hereof.

One simple form of my new arrangement is shown in detail in Figs. 2 and 3. These figures show at 30 a rectangular strip of rubber secured in face-to-face relation to the lower margin of the mold-board 1 as by bolts 31. The strip in this instance is on the front side of the mold-board and extends from its lower edge say from one-half to three-quarters of an inch, so that the mold-board buttresses the major area of the strip. In order to prevent buckling of the rubber strip, especially where a non-reinforced strip is used, or one with flexible reinforcement, a metal securing and clamping strip is employed at 32, either in one piece or in sections. This may cover as much of the area of the strip as found necessary under practical conditions.

The flexible wiper strip 30 may be on the order of conveyor belt stock, say from $\frac{1}{8}$ to $\frac{3}{4}$ inch thick, composed largely of reinforcing fabric and preferably having fairly heavy layers of tough, pliable rubber, at least one-eighth of an inch thick on both sides of the conventional reinforce layers. The rubber stock is selected and cured for both toughness and abrasion-resisting qualities in accordance with practice to this end, as known in the rubber industry. For further guidance, it is to be noted that the rubber stock is somewhat tougher than tire tread rubber, it being well known that the latter is selected in part for traction effect, which, in the present instance, is not needed or, in fact, desired. The known expedients for producing rubber with a relatively low co-efficient of friction should be employed, but without sacrifice of the quality of toughness and strength any more than necessary. The above discussion of materials applies to all the illustrated forms.

For adjustment of the strip up and down, the strip may originally have a plurality of sets of holes 33 or vertical slots for receiving the bolts or securing members 31, so that as the lower edge of the rubber strip wears away or becomes damaged, the strip may be trimmed off and adjusted to a new position.

The same device serves to adjust the wiping

action as may be found necessary in different dispositions of the mold-board and for operating on different track surfaces. The strip, particularly if made the same on both sides, may be reversed, both from end to end and by inverting, so that a new sharp edge is available for contact with the track surface T, when another becomes worn, until all four longitudinal corners have been used up. Even then, as above noted, the strip may be trimmed off and a new set of holes 33 used for the attachment bolts and the life of the strip further extended.

Fig. 2 illustrates that the rubber strip 30 may be made in sections, the horizontal limits of the sections being indicated at 30'. This device is useful in that it permits a portion only of the entire track-contacting strip to be replaced when damaged. In any form shown, a plurality of layers of rubber may be formed separately from each other and clamped together for use if a plurality of independently supported wiping edges are desired. In Fig. 3a such separate layers 30'' are shown mounted as the strip 30 is, in Fig. 3.

Referring to Fig. 4, this arrangement is somewhat on the order of that of my Patent 1,925,397, and the rubber e. g. strip 30a is supported on the rear side of the mold-board, the rubber being retained between its marginal surface and a suitable reinforcing or backing member 40, which, in the channel form shown is provided with a rearwardly and downwardly inclined web portion 41. This portion 41 is generally similar to the element which I term a "safety blade" (shown in my said patent). The unattached flange of the member 40 may be turned rearwardly upwardly, as at 42. The strip 30a passes under the member 40 so as to form substantially a wiping edge at 30a' for contact with the track surface, as shown, and then upwardly along the flange 42, to which the rear margin of the strip may be suitably secured as at 43. The strip clamping arrangement may include a coacting rib and groove effect, as at 44, embracing and deforming a small portion of the strip between them, longitudinally of the mold-board, so that the strip will be certain not to work loose. The strip may be originally made wide enough to permit its being moved several times in its anchorage to present a new wiping surface at 30a' and the surface itself may be serrated, as shown, for better wiping effect, i. e. presenting a plurality of wiping edges.

The above described form of device is better adapted for light duty equipment and does not require any casters, or other supports for holding the mold-board off the track. By reason of the upwardly inclined portions, both forwardly and rearwardly of the line or lines of contact, the implement may be moved forwardly, as well as rearwardly, over the track without having to lift the mold-board. Each time the strip is moved to a new position, new holes may be formed for the securing means at 43, and the excess material back of the flange 42 may, of course, be trimmed off.

Fig. 5 illustrates that the rubber may be joined, as by vulcanization to one side of a metal plate, for attachment in place of the usual wear blade of conventional and other mold-board forms. In the particular form shown the plate 50 is positioned in trailing relation to the mold board 1 on the underside of a special flange 51 thereof, (or the usual reinforcing angle member, not shown), and rubber at 30b and/or 30c is vulcanized or otherwise joined in any known manner

to one or both sides of the plate 50, as desired, and preferably in such manner that the metal is coextensive with the rubber for fully buttressing the latter. In case the rubber is joined to both sides of the plate, as shown, (to permit reversibility with yielding wiping action in both positions) the plate may be perforated and the individual strips of rubber vulcanized to each other through the perforations (see illustrative opening at 50').

When the rubber is joined to one side only (not shown) then the plate 50 is usable in one position in the manner of the arrangement of my above-identified patent, assuming the plate is made of suitable wear-resisting material; this arrangement being particularly desirable in the event a harder surface than that afforded by rubber is desired at times, say for leveling purposes, or scraping frozen snow off the track.

Figs. 6 and 6a show another arrangement wherein the track-contacting wiping member may be easily adjusted several times to present unworn surfaces after other surfaces become too worn to effect the desired operation. Preferably the rubber member 30d (shown as fluted to provide separate wiping blade effects), has a central metal grommet 55, and the rubber may be cut away at several places to permit attachment by U-bolts 56 or other suitable fastening devices which embrace the grommet, but do not come into contact with the track surface to be cleared.

As shown in Fig. 6, the rear side of the mold-board, near its lower margin, is reinforced with a Z-bar 51, and the web portion of the Z-bar may be perforated in suitable fashion to receive the legs of the U-bolts, the attaching nuts of which are clamped against the top of the web. The ends of the grommet may be provided with suitable welded on heads 58, and the U-bolts may occupy the space shown between the extreme sections 30d and the heads at both ends of the unit. Whenever the rubber becomes worn, in one region, the U-bolts may be loosened, the sections suitably turned to present a new wearing surface and the U-bolts then retightened.

In the arrangement of Fig. 7, the rubber track-wiping element 30e, is arranged rearwardly from the main mold-board 1, and operates to remove whatever the main mold-board rides over. Thus, the main mold-board may be of entirely conventional construction and be provided with a conventional wear blade of such character and position in respect to the track that it will withstand concussion with relatively rigid projections on the track surface and under most conditions dislodge or break the same and carry the material composing such away, leaving very little debris to be removed by the element 30e. Nevertheless, whatever of a readily movable nature is likely to be left on the track will be picked up by the element 30e, which has its own mold-board 1a of suitable shape supporting the rubber wiper element at its lower edge.

Both the wiper and support may be in general accordance with any of the previously described constructions (manner of attachment of rubber strip not illustrated).

The mold-board or mold-board effect 1a is practically essential for the wiping element, even though only a relatively small amount of material is to be removed thereby, and this follows from the fact that the operation is continuous and generally at fairly high speed. If the cleared track surface width is only slightly greater than the usual wheel space of an automobile, and the

wiper blade has only to pick up an inch or so of snow or slush e. g., the accumulation toward the discharge side (assuming the blade is angled) will be many inches deep and moreover, on account of speed, the rapidly accumulating material is highly active and some means must be provided to prevent the material from being thrown over the wiper blade and being deposited behind it onto the trackway which the blade has passed over. The mold-board 1a is therefore of considerable height and preferably curved for rolling action on the material to be moved. It may be set approximately as shown and yieldingly suspended or supported, as on arms 60, preferably so arranged that the wiper and board unit may swing from the active position shown to an inactive position, such as indicated in broken lines, when the implement is backed up. The springs 61 (only one shown) may be of any type and the strength determined in accordance with the amount of work the supplemental mold-board and its wiper blade has to perform.

The manner of operation of the various forms of the invention illustrated will be clear from the above, and it will be seen that aside from various novel constructional features I have provided a track-clearing implement of the class shown which, except under unusual conditions, will completely clear the track surface; which will be silent in operation; will be automatic in its action in locally riding over relatively fixed projections such as would have to be broken away by or cause damage to rigid track-contacting elements of the kind previously in common use without yielding safety supports (it being noted that substantially only such portions of the rubber element will, in most instances, be raised by such projections and not the entire blade or blade section encountering the projection, as formerly); which may be disposed for effective operation at various angles relative to the direction of movement of the implement, so as to laterally move the foreign material; which, in the case of operation on slush e. g. over relatively smooth track surfaces, will operate to greatly accelerate drying and thereby greatly reduce traffic hazards, and which, notwithstanding its non-rigid character, is not nearly as subject to injury by abrasion when in contact with relatively rough pavement surfaces, etc. as one would expect.

I claim:

1. In a track-clearing implement of the class described, a mold-board, a relatively rigid metal member secured to the mold-board at its lower margin, and a non-metallic yielding pliable strip embraced between the mold-board and said member and depending past both into contact with the surface of the track to be cleared.

2. In a track-clearing implement of the class described, a mold-board, a substantially rigid plate-like member removably secured to the mold-board at its lower margin, and a rubber member joined to the plate member for removal therewith from the mold-board, said rubber member extending below the lower limit of the plate into wiping contact with the surface of the track to be cleared.

3. In an apparatus of the class described, a mold-board, a rubber member having two or more surfaces having relatively sharp edges, each adapted to wipingly contact with a track surface, and means to position the member on the mold-board to present said edges into wiping relation to the track, one at a time.

4. In apparatus of the class described, a mold-

board, means to support the lower edge of the mold-board off the surface to be cleared, and a rubber wiper secured to the mold-board near its lower edge and adapted to present a plurality of wiping edges to the surface to be cleared.

5 5. In a track-clearing implement of the class described, a mold-board and means to support the same off the surface to be cleared, a rubber, track-wiping member disposed adjacent the lower margin of the mold-board, and means including
10 relatively rigid means embedded in the rubber for attaching said member to the mold-board.

6. In a track-clearing apparatus of the class described, a mold-board, a substantially rigid
15 downwardly and rearwardly extending blade-like member thereon at its lower edge, and a rubber track-wiper underhanging the blade-like member and having a relatively sharp edge disposed to wipingly contact with the track surface to be
20 cleared.

7. In a power-driven track-clearing implement, a mold-board and means to support the same in generally upright position out of contact with the surface of the track to be cleared, a rubber
25 wiping member located behind the mold-board and having a relatively sharp wiping edge in wiping contact with the track surface to be cleared, and means to support the wiping member in operative relation to the track.

8. In an apparatus of the class described, a frame, a mold-board carried by the frame, means to movably support the mold-board for movement over the track surface to be cleared and out of contact therewith, and a rubber wiper
30 member carried by the frame behind the mold-board, adapted to wipingly contact with the track surface to be cleared, and means separate from the mold-board arranged to support and laterally guide accumulated material from the
35 wiper member.

9. In a track-clearing implement of the class described, having a mold-board and means to

support the same for movement along a track to be cleared, a track surface wiping member, comprising a strip of yielding, resilient, elastic material of materially greater height than thickness, said strip being arranged to contact edge-
5 wise with the track and operatively bridge the mold-board and track, and being sufficiently pliable so that, when in use, it will bend rearwardly through a substantial angle to present its edge to the track surface in the manner of a
10 squeegee.

10. In a track-clearing implement having a substantially rigid mold-board adapted to be supported in generally upright position with its lower edge elevated from the track surface to be
15 cleared of accumulated material, and a yielding rubber member associated with the lower margin of the mold-board in such manner as to, in operative effect, extend the forward surface of the mold-board downwardly into wiping contact
20 with such track surface, said member being disposed relative to the mold-board, so that it makes initial contact with said surface along a line which is materially rearwardly from the lower edge of the mold-board.

11. In an implement of the class described, in combination, a mold-board and means to support the mold-board out of contact with the track surface to be cleared, a rubber member
25 secured to its lower margin, and in effect continuing the forward surface of the mold-board downwardly into contact with the track surface, said member having a relatively sharp track-surface-wiping edge.

12. In an apparatus of the class described, a mold-board, a rubber track-wiping member secured thereto at the lower edge of the mold-board, the rubber member being adjustable to different positions below the edge of the mold-board so as to vary its wiping action on a track
35 surface.

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