Jan. 15, 1929. 1,698,809

L. B. ANGELL

SNOWPLOW

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Fig. 1.

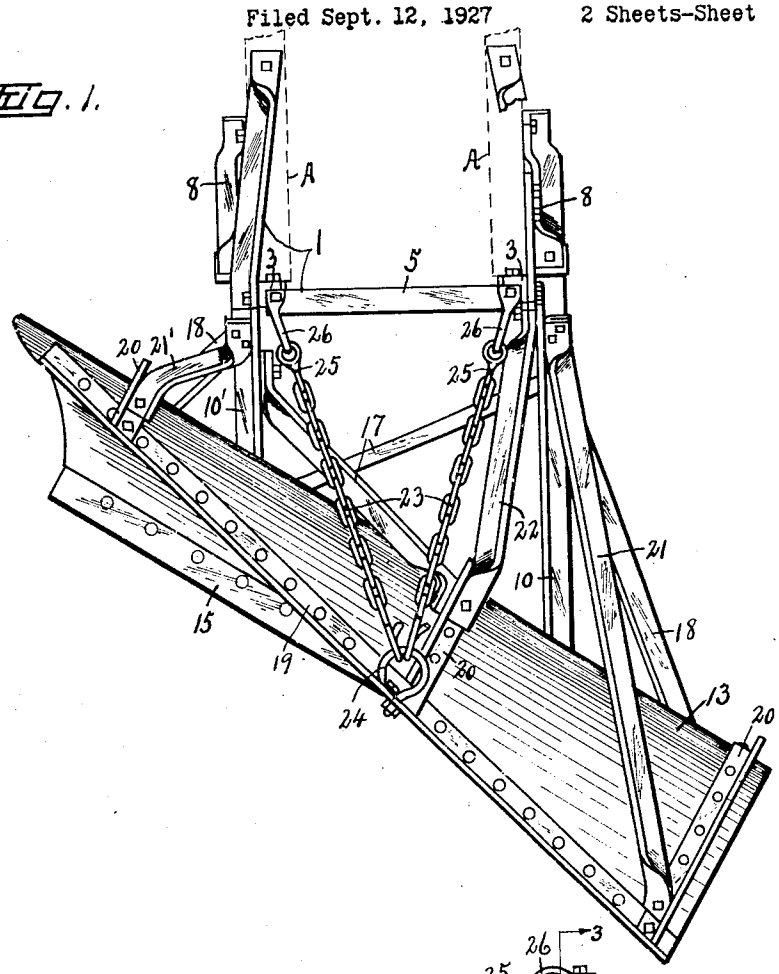
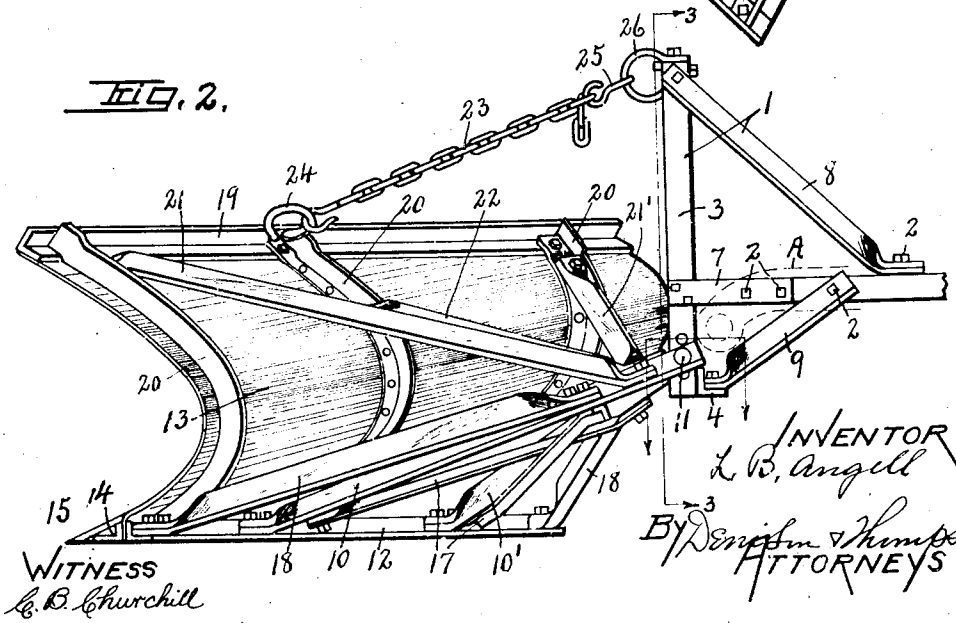



Fig. 2.




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Fig. 3.

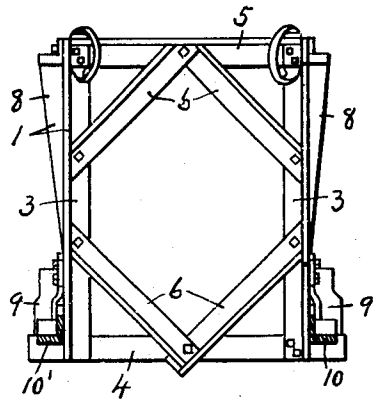



Fig. 4.

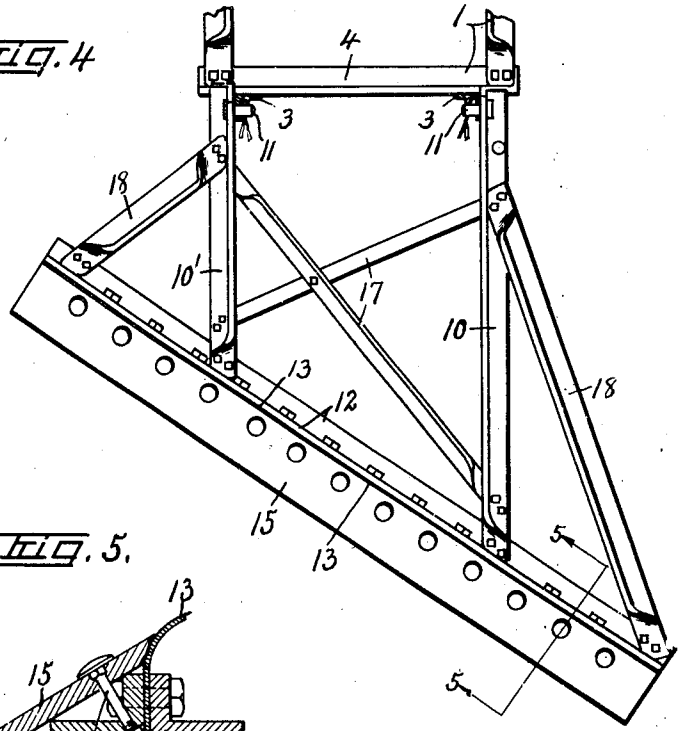



Fig. 5.




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# UNITED STATES PATENT OFFICE.

LYNN B. ANGELL, OF SOUTH OTSELIC, NEW YORK.

## SNOWPLOW.

Application filed September 12, 1927. Serial No. 219,112.

This invention relates to a snowplow adapted to be used more particularly as an attachment to the front end of the chassis frame of a motor vehicle to be propelled by and ahead of said vehicle and refers more particularly to the construction of the mold board and scraper blade along the lower edge thereof and to the supporting frame therefor which is adapted to be hinged to a supplemental frame carried by the front end of the chassis frame of an automobile to swing vertically about a horizontal axis for varying the depth of cut of the scraper blade into the snow or ice.

The main object is to support the mold board and scraper diagonally to the direction of travel of the machine to which it is attached and to construct and support the mold board and scraper in such manner that it will enter the snow and ice with a minimum shearing resistance and deflect said snow or ice laterally to one side of the path of travel of the plow as fast as it is loosened and picked up by the scraper blade thereby preventing the accumulation of excess quantities of the snow and ice against the blade and mold board and incidentally greatly reducing the resistance to the forward propulsion of the plow.

One of the specific objects is to make the mold board concavo-convex in cross section with its upper and lower edges disposed in horizontally parallel planes but in vertically intersecting planes so that the vertical plane of its upper edge will intersect the front edge of the scraper blade substantially midway between the ends thereof while the end of the upper edge of the mold board projecting farthest forward will overhang and project forwardly beyond the corresponding end of the scraper blade to trap the snow and ice at the leading end of the plow against overriding the top of the plow and at the same time assist in the lateral deflection of the snow and ice toward and away from the rearmost end of the plow.

Another specific object is to provide a simple and efficient means for supporting the scraper blade in an upwardly and rearwardly inclined position and for clamping the lower edge of the mold board along the rear edge of the scraper blade so as to form a substantially continuous unbroken impact surface from the cutting edge of the blade against the entire front surface of the mold board from bottom to top thereof.

Other objects relating more particularly to the bracing of the mold board will be brought out in the following description.

In the drawings:—

Figure 1 is a top plan of a snow plow embodying the various features of my invention.

Figure 2 is a side elevation of the same, the dotted lines indicating portions of the chassis frame of an automobile to which the supplemental frame of the plow is attached.

Figure 3 is a vertical sectional view taken in the plane of line 3—3, Figure 2.

Figure 4 is a horizontal sectional view through the mold board in a plane just above the scraper blade, showing the lower portions of the supporting frame for the scraper blade and mold board, together with the hinge connections between said supporting frame and supplemental frame which is adapted to be secured to the chassis frame.

Figure 5 is an enlarged transverse sectional view through the scraper blade and adjacent portion of the mold board, showing more particularly the manner of mounting the scraper blade and mold board upon the underlying portions of the supporting frame taken on line 5—5, Figure 4.

In order that the invention may be clearly understood I have shown by dotted lines the front portions of the sills —A— of an automobile to which a supplemental frame —1— is adapted to be secured by bolts —2— or equivalent fastening means capable of being released when it is desired to remove the plow from the chassis frame.

As illustrated, this supplemental frame comprises a pair of upright posts —3— arranged in parallel spaced relation corresponding approximately to the spacing of the sills —A— and connected by lower and upper cross bars —4— and —5— which are braced against the posts —3— by diagonal braces —6—, Figure 3.

These posts —2— extend above and below the horizontal plane of the sills —A— and are provided with rearwardly extending arms —7— adapted to be clamped by the bolts —2— to the sides of the sills, the upper ends of the posts being additionally braced to the rearwardly extending bars —7— by braces —8— while the lower cross bar —4— is connected to the bars —7— by additional braces —9— as shown more clearly in Figure 2.

The supporting frame for the mold board

and scraper comprises a pair of forwardly and rearwardly extending bars —10— and —10′— arranged in parallel spaced relation corresponding approximately to the spacing of the upright posts —2— and are pivoted at —11— to the lower ends of said posts to swing vertically about a horizontal axis parallel with the vertical plane of said posts and to extend forwardly and downwardly some distance therefrom but of unequal length to support at their front ends the mold board and scraper blade in a horizontal plane diagonally to the direction of travel of the propelling machine.

A substantially straight angle iron —12— is bolted or otherwise secured to the front ends of the bars —10— and —10′— to extend horizontally and diagonally to the direction of travel of the machine and some distance laterally beyond said bars —10— and —10′— or substantially equal distances beyond the longitudinal center of the chassis frame and supplemental frame —1— to form a part of a wearing shoe adapted to ride upon or in close proximity to the pavement or road bed when the plow is adjusted for use.

This angle iron —12— is arranged with one of its flanges in a substantially horizontal plane and its other flange in a vertical plane along the front edge of the horizontal flange for receiving and partially supporting the lower edge of a mold board as —13— which is bolted or otherwise secured to the front face of the upright flange as shown more clearly in Figures 2 and 5.

An additional angle iron —14— extends horizontally along the front side of the vertical flange of an angle iron —12— in sufficiently spaced relation thereto to receive the lower edge of the mold board —13— between them and is bolted or riveted to the upright flange of the first-named angle iron by the same rivets which fasten both angle irons to the front and rear faces of the lower edge of the mold board.

That is, one of the flanges of the angle iron —14— is disposed in a horizontal plane and its other flange disposed in a vertical plane along the rear edge of the horizontal flange to engage the front face of the lower edge of the mold board —13— and thereby to firmly hold that part of the mold board between the upright flanges of both of the angle irons.

A substantially straight and flat scraper blade —15— of steel or other suitable metal is seated upon the front edge of the lower horizontal flange and upon the upper edge of the upright flanges of the angle iron —14— and is rigidly secured to the front angle iron by bolts —16— as shown more clearly in Figure 5 so that the scraper blade —15— will be firmly held in an upwardly and rearwardly inclined plane with its rear edge resting against the adjacent portion of the mold board —13— and its lower front edge beveled and disposed in substantially the same horizontal plane as the lower faces of the angle irons —12— and —14— to ride upon or closely to the surface of the pavement when the plow is adjusted for use.

The bars —10— and —10′— are held in fixed relation by cross braces —17— rigidly secured thereto and to each other to form a part of the supporting frame for the mold board and scraper blade, said bars —10— and —10′— being also connected to the opposite ends of the angle iron —12— by additional braces —18—, Figure 4.

The mold board —13— and scraper blade —15— extend horizontally and diagonally to the direction of travel of the machine the full length of the angle irons —12— and —14—, the mold board being curved rearwardly, upwardly and forwardly from its lower edge to its upper edge and is preferably made of sheet steel or equivalent metal concavo-convex in cross section with its concave side facing forwardly and its upper edge disposed at a greater angle to the direction of travel of the machine than its lower edge.

That is, the lower and upper edges of the mold board are disposed in parallel horizontally spaced relation but in different vertical planes intersecting each other substantially midway between the ends of the mold board so that the end of the upper edge corresponding to the leading end of the lower edge projects forwardly some distance beyond said leading end or toe of the scraper blade while the other end or heel of the upper edge of the mold board is disposed in a vertical plane at the rear of the heel of the scraper blade, the longitudinal center of the mold board being disposed in a horizontal plane substantially parallel with the cutting edge of the scraper blade.

The object of this particular construction of the mold board is to cause the snow or ice impinging against the front concave face thereof as the plow is moved forwardly to be deflected laterally toward the heel of the plow as fast as it is loosened and picked up by the toe of the mold board and also to confine the loosened snow and ice between the lower and upper edges of the mold board particularly at the leading ends thereof and thus to prevent over-riding of ice and snow over the top of the mold board.

An additional angle iron —19— is riveted or otherwise secured to the upper edge of the mold board —13— to extend from end to end thereof for reinforcing purposes.

Suitable braces —20— are extended across and around the rear convex sides of the mold board in longitudinally spaced relation to follow closely the contour thereof and are riveted or otherwise secured to said mold

board and to the lower and upper angle irons —12— and —19— for rigidly bracing and reinforcing the mold board against deformation or yielding by pressure of the ice and snow thereagainst when the plow is in action.

The end braces or reinforcing bands —20— are connected by rearwardly extending braces —21— and —21'— to the arms —10— and —10'— while the intermediate brace or band —20— is connected by a brace —22— to the thrust bar —10—, said braces —21—, —21'— and —22— serving to additionally hold the mold board against yielding under pressure of the snow and ice against its front face.

It will be seen from the foregoing description that the mold board and scraper blade together with the supporting frame therefor are movable vertically about the axis of the pivots —11— for varying the depth of cut of the scraper blade or rather for moving the mold board and scraper blade to and from its operative position.

Any suitable means may be provided for raising and lowering the supporting frame for the mold board and scraper blade, said means consisting in this instance of a pair of chains or cables —23— having their front ends connected to a suitable eye bolt —24— on the upper angle iron —19— near the center thereof and their rear ends adjustably connected to a pair of hooks —25— which, in turn, are attached to anchor loops —26— on the upper cross bar —5— of the supplemental frame —1—.

*Operation.*

The raising and lowering of the mold board and its supporting frame may be accomplished by simply releasing the chains —24— from the hooks —25— and then raising or lowering the mold board as required and re-anchoring the chains in their respective hooks.

When the mold board and scraper blade and the supporting frame therefor are adjusted for use and propelled forwardly into ice or snow the latter are first picked up by the toe of the scraper blade —13— which deflects the loose snow or ice laterally toward and beyond the heel of the mold board as fast as it is picked up by the scraper blade, it being understood that the overhanging of the upper edge of the toe of the mold board beyond the vertical plane of the corresponding end of the scraper blade effectively prevents the over-riding of the loosened snow and ice across the top of the mold board.

What I claim is:—

1. In a snowplow, a straight angle iron extending horizontally diagonally to the direction of travel of the plow and having one of its flanges extending upwardly along the rear edge of the other flange, a substantially flat and straight scraper blade seated flatwise on the front edge of the lower flange and the upper edge of the rear flange and secured thereto to assume an upwardly and rearwardly inclined position, and a mold board having its lower edge secured to the rear face of the rear flange and its upper edge disposed in a vertical plane intersecting the front edge of the scraper blade between the ends thereof.

2. In a snowplow, a straight angle iron extending horizontally diagonally to the direction of travel of the plow and having one of its flanges extending upwardly along the rear edge of the other flange, a substantially flat and straight scraper blade seated flatwise on the front edge of the lower flange and the upper edge of the rear flange and secured thereto to assume an upwardly and rearwardly inclined position, and a mold board having its lower edge secured to the rear face of the rear flange, and its upper edge disposed in a horizontal plane, but in a vertical plane intersecting the front edge of the scraper blade substantially midway between the ends of said blade.

3. In a snowplow, a straight angle iron extending horizontally diagonally to the direction of travel of the plow and having a vertically projecting flange along its rear edge, an additional straight angle iron parallel with the first-named angle iron and in the same horizontal plane and having its front edge provided with a vertical flange adjacent the rear flange of the first-named angle iron, a substantially straight and flat scraper blade secured to the front edge of the lower flange and to the upper edge of the vertical flange of the first-named angle iron to incline rearwardly and upwardly across the angle of said first-named angle iron, and a mold board having its lower edge secured to and between the adjacent upright flanges of both of the angle irons and its upper edge disposed in a vertical plane intersecting the front edge of the scraper blade substantially midway between the ends thereof.

In witness whereof I have hereunto set my hand this 26th day of Aug. 1927.

LYNN B. ANGELL.