



June 6, 1944.

E. L. WIEDMAN

2,350,437

SNOW PLOW

Filed March 12, 1941

7 Sheets-Sheet 2

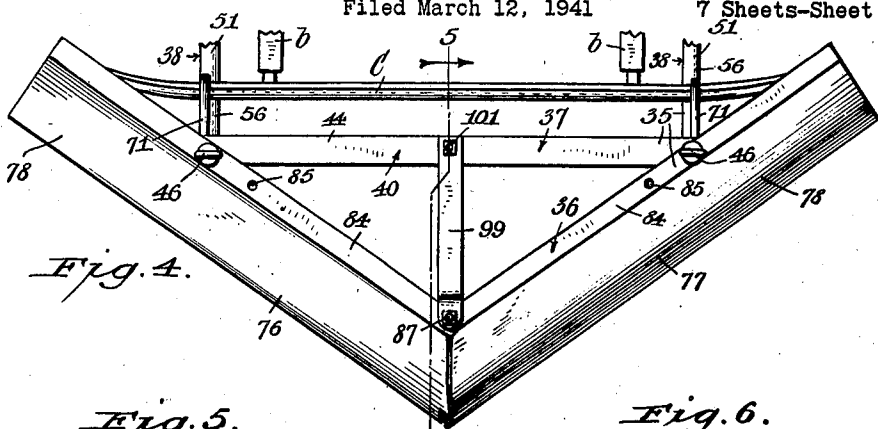


Fig. 4.

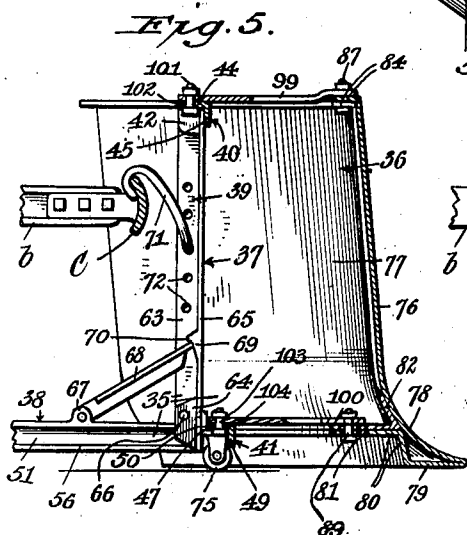


Fig. 5.

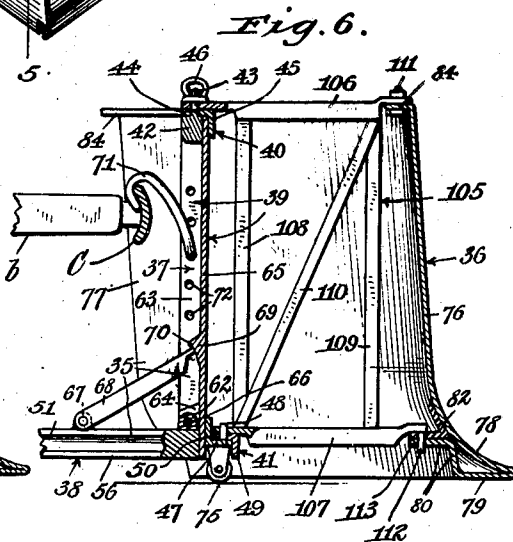


Fig. 6.

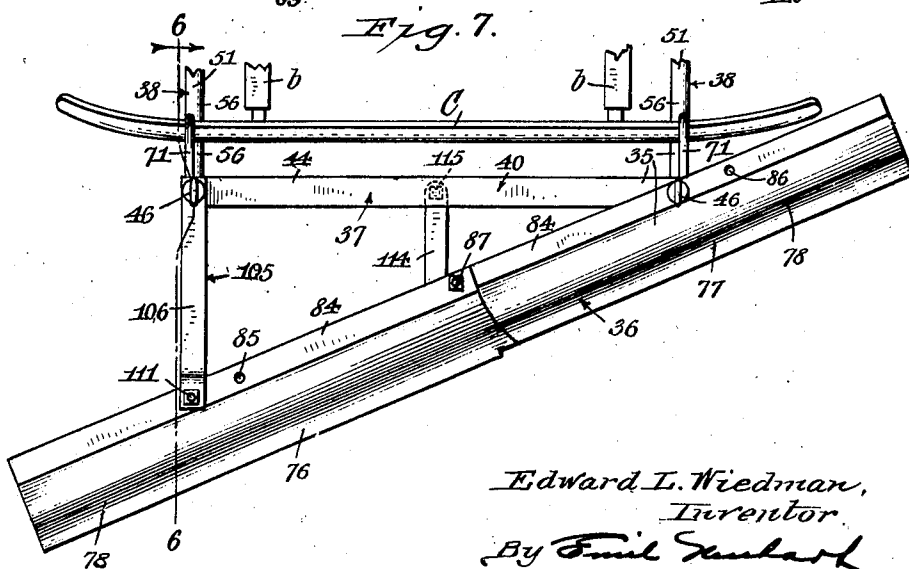


Fig. 7.

Edward L. Wiedman,  
Inventor.

By Emil Scharf  
Attorney.

June 6, 1944.

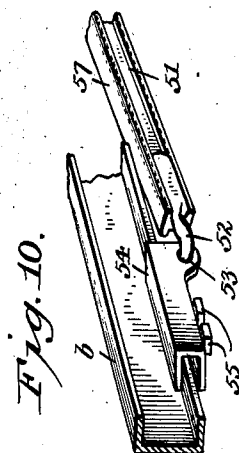
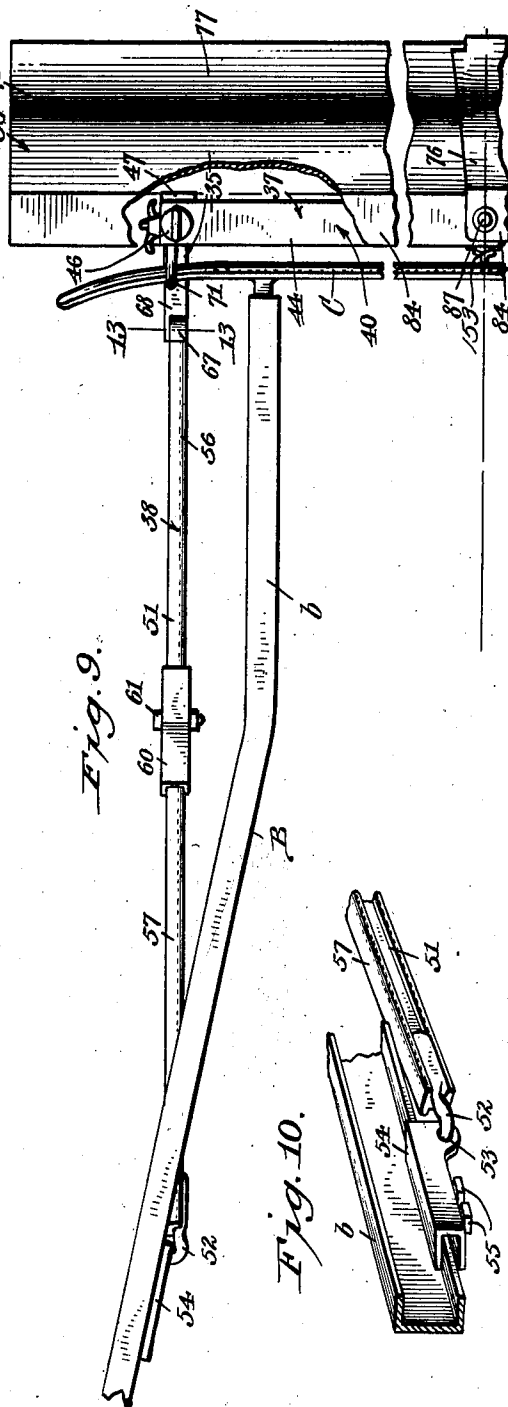
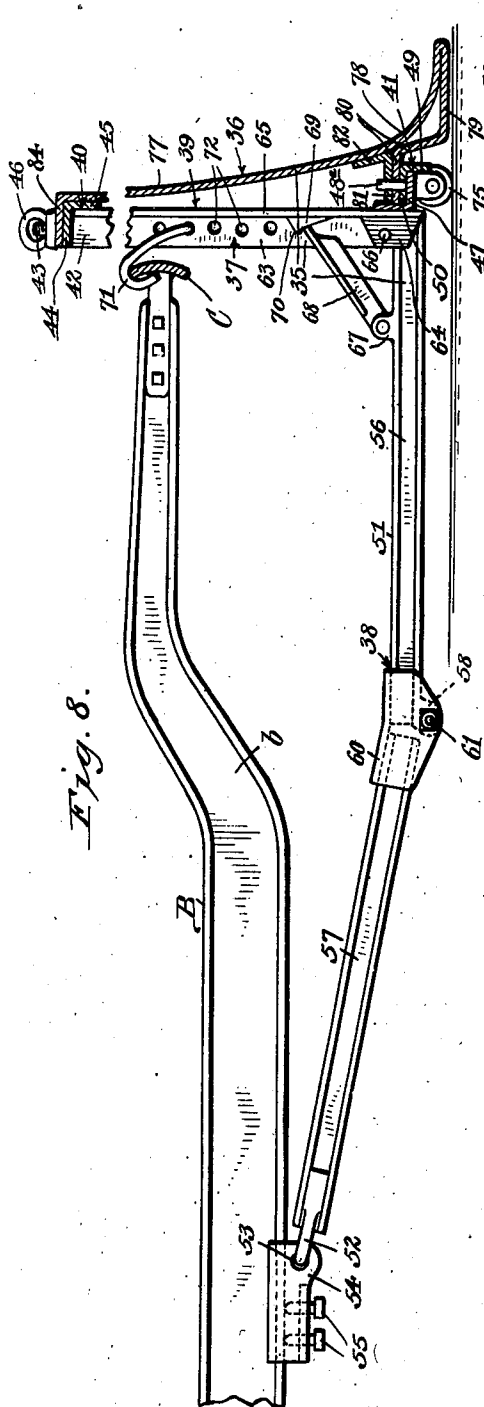
E. L. WIEDMAN

2,350,437

SNOW FLOW

Filed March 12, 1941

7 Sheets-Sheet 3



Edward L. Wiedman, Inventor  
By *Emil Kuehler*  
Attorney.

June 6, 1944.

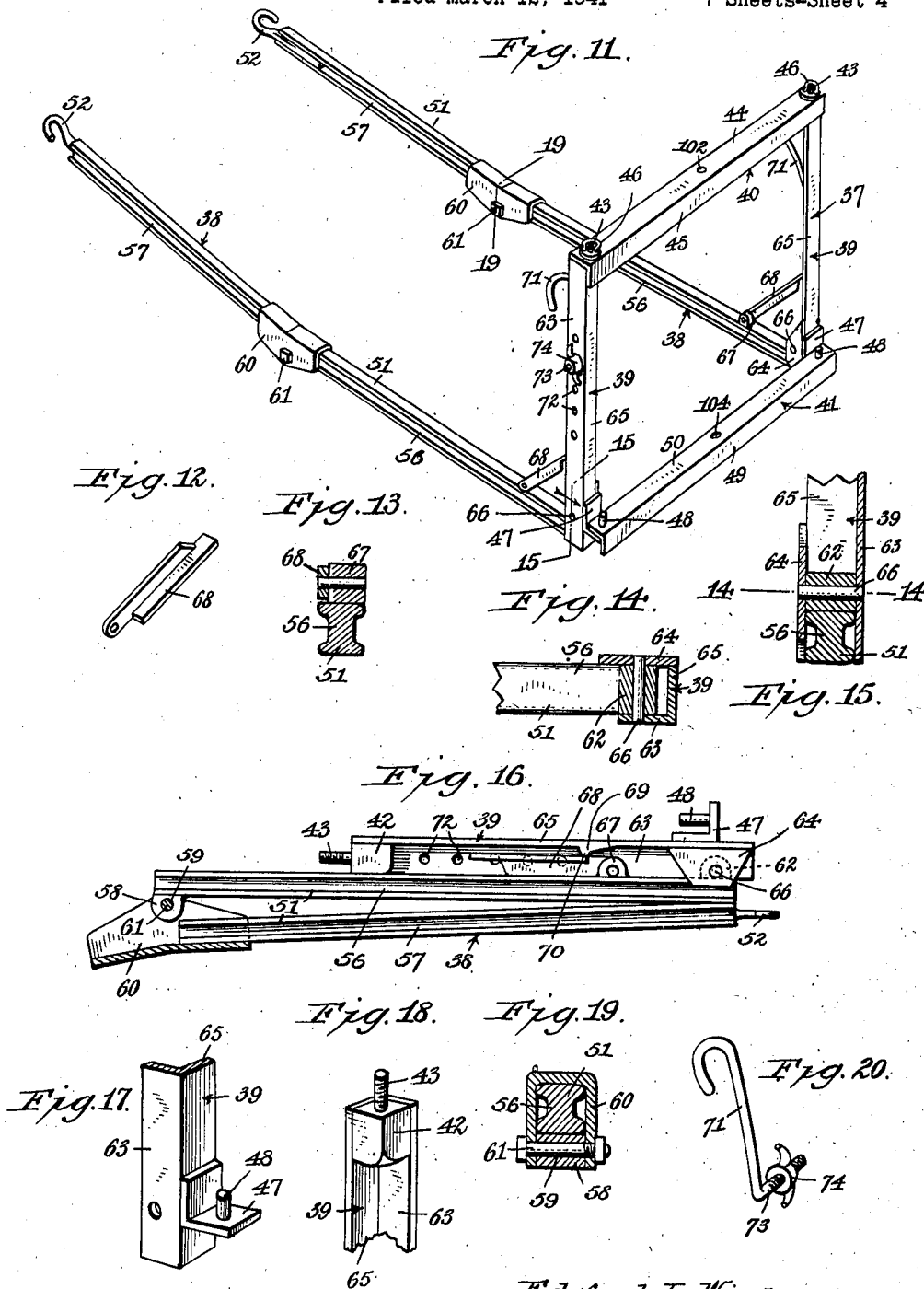
E. L. WIEDMAN

2,350,437

SNOW PLOW

Filed March 12, 1941

7 Sheets-Sheet 4



Edward L. Wiedman  
Inventor.  
By Emil Kunkel  
Attorney.

June 6, 1944.

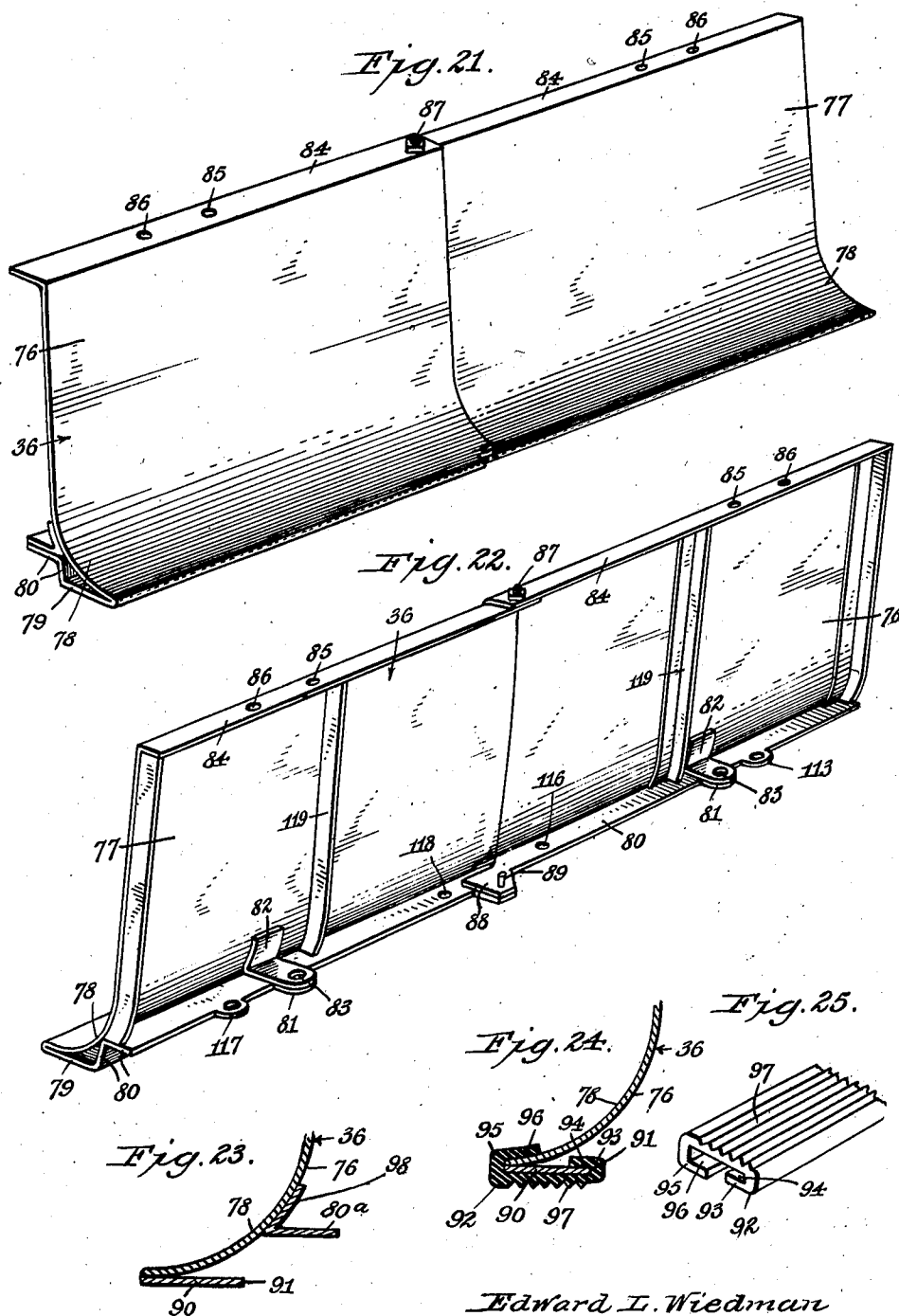
E. L. WIEDMAN

2,350,437

SNOW PLOW

Filed March 12, 1941

7 Sheets-Sheet 5



Edward L. Wiedman  
Inventor;  
By Emil Kunkel  
Attorney.

June 6, 1944.

E. L. WIEDMAN

2,350,437

SNOW FLOW

Filed March 12, 1941

7 Sheets-Sheet 6

Fig. 26.

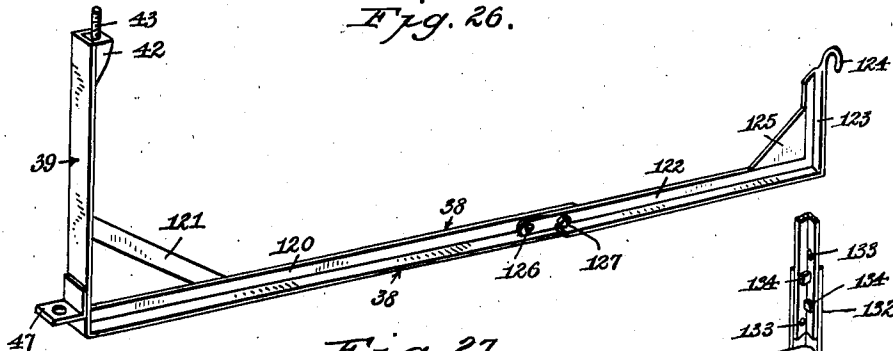


Fig. 27.

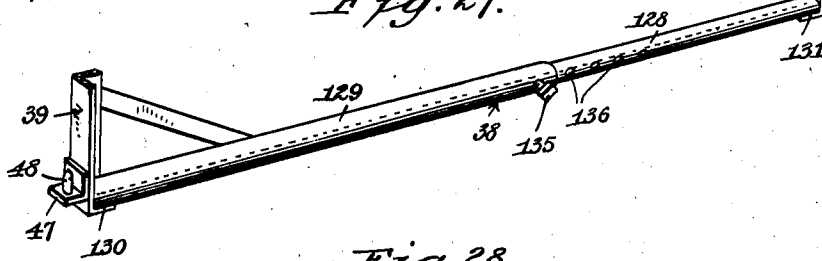


Fig. 28.

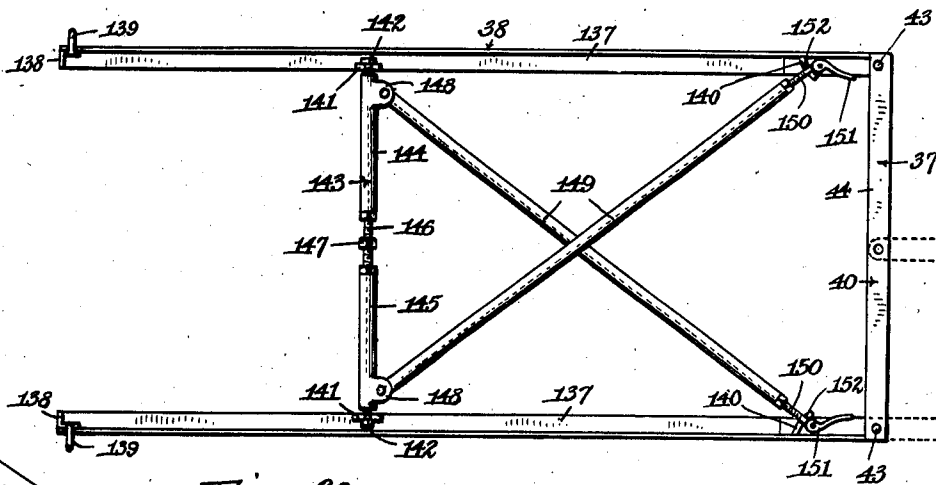


Fig. 29.

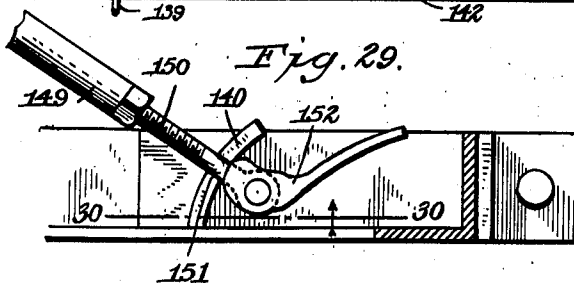
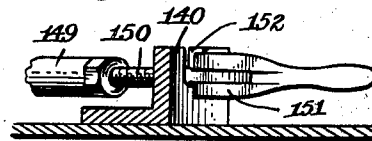


Fig. 30.



Edward L. Wiedman  
Inventor,  
By Emil Kunkert  
Attorney

**June 6, 1944.**

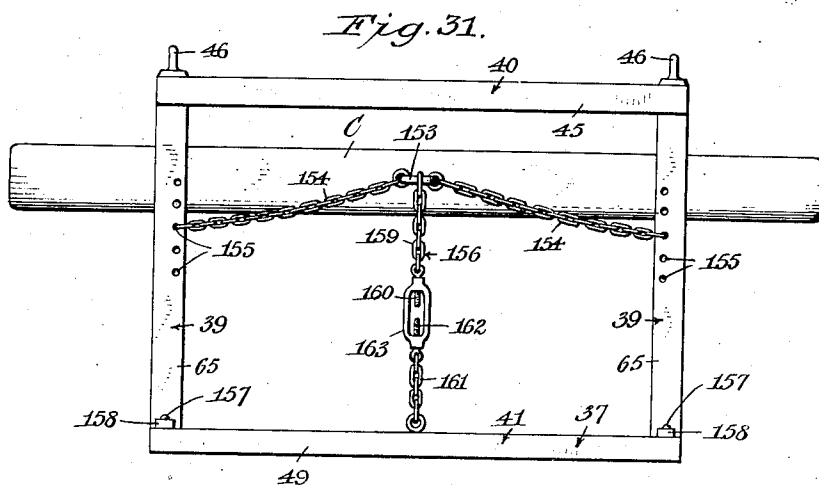
E. L. WIEDMAN

**2,350,437**

SNOW PLOW

Filed March 12, 1941

7 Sheets-Sheet 7



Edward L. Wiedman  
Inventor,  
By Emil Kunkel  
Attorney.

## UNITED STATES PATENT OFFICE

2,350,437

## SNOWPLOW

Edward L. Wiedman, Tonawanda, N. Y.

Application March 12, 1941, Serial No. 382,909

17 Claims. (Cl. 37-44)

My invention relates to a snow plow and scraper, and more particularly one adapted for attachment to a passenger automobile, light truck, delivery automobile, or similar self-propelled vehicle.

The primary object of my invention is to construct a snow plow which can be easily attached to a suitable self-propelled vehicle and be braced and anchored by improved means so that the strain applied thereto will be transferred directly to the frame or chassis of the vehicle and thus avoid placing strains or stresses upon any of the operating parts of the vehicle.

It also has for its object to construct a plow which can be easily converted into a scraper for leveling uneven surfaces and for scraping snow and loose ice particles from skating ponds.

Another object of my invention is to provide a plow which can be conveniently "knocked-down" or collapsed so that when not in use it can be placed in the trunk section of an automobile or otherwise stored away for future use in compact form.

Another object of my invention is to provide a strong light-weight, yet rigidly applied plow to a self-propelled vehicle in a manner that will in no way necessitate remodeling the vehicle to which it is to be attached, nor to in any manner alter any part of the vehicle.

The invention has for a further object to provide an improved plow for private use which can be easily attached to and be as readily removed from an ordinary family automobile without in any manner placing the body of the automobile or other parts of the automobile mounted on or supported by its chassis, under strain during the operation of plowing from any area, such as a driveway, the area leading to or surrounding a service station, or for disposing of snow-banks or drifts.

A still further object is to provide a device for this purpose which is adjustable to four positions so that snow may be directed to the right, to the left, both to the right and the left, or straight ahead.

Other objects and advantages will appear from the description to follow.

Having in mind the various objects herein set out, the invention consists in the novel arrangement, and in the combination of parts to be hereinafter described and more particularly pointed out in the subjoined claims.

In the drawings:

Fig. 1 is a perspective view of the major por-

tion of a passenger automobile having my improved plow attached thereto.

Fig. 2 is a side elevation of the plow, showing the same attached to the side members of the chassis of an automobile, also shown in side elevation, the body and wheels of the automobile being shown in dotted lines to illustrate the co-relationship of the various parts.

Fig. 3 is a plan view of the chassis of an automobile and of the plow, showing the manner of connecting and bracing the latter to the chassis; the wheels of the automobile being shown in dotted lines.

Fig. 4 is a plan view of the plow on a somewhat larger scale than Figs. 1 to 3, showing the rear portions of the reaches or anchor rods broken away and showing also the front bumper and extreme front ends of the side members of the chassis, the plow-share or plow proper being adjusted for directing snow both to the right and left.

Fig. 5 is a longitudinal section taken on line 5-5, Fig. 4, looking in the direction of the arrow crossing said line.

Fig. 6 is a longitudinal section taken on line 6-6, Fig. 7, looking in the direction of the arrow crossing said line.

Fig. 7 is a view similar to Fig. 4, showing the plow-share adjusted to direct snow laterally in one direction.

Fig. 8 is a longitudinal section through the plow on a somewhat larger scale than shown in the previous figures of the drawings, one of the side members of the chassis of an automobile being shown in side elevation and the front bumper in cross section to better illustrate the manner of attaching and bracing or anchoring the plow; the plow-share or plow proper being shown adjusted for use to push snow straight ahead or as a scraper.

Fig. 9 is a plan view of the plow as shown in Fig. 8, a trifle more than one-half the width being shown.

Fig. 10 is a perspective view of the rear or attaching-end of one of the reaches or anchor-rods, the connector for the same, and a portion of one of the side member of the chassis of the automobile to which said connector is secured.

Fig. 11 is a detached perspective view of the plow frame and its attached reach device.

Fig. 12 is a detached perspective view of one of the diagonal braces for maintaining the reaches or anchor-rods in proper relation to the uprights of the plow frame.

Fig. 13 is an enlarged cross section taken on line 13—13, Fig. 9.

Fig. 14 is a horizontal section taken on line 14—14, Fig. 15.

Fig. 15 is an enlarged vertical section taken on line 15—15, Fig. 11, looking in the direction of the arrow crossing said line.

Fig. 16 is a side view of one of the unconnected uprights of the plow-frame and the attached reach or anchor bar in folded condition.

Fig. 17 is a perspective view of the lower portion of one of the uprights of the plow-frame.

Fig. 18 is a perspective view of the upper portion of one of the uprights of the plow-frame.

Fig. 19 is an enlarged cross section taken on line 19—19, Fig. 11.

Fig. 20 is a detached perspective view of one of the bumper anchor-hooks or hangers whereby the front end of the plow-frame is supported from the bumper of the automobile, preferably while inactively transporting the vehicle-attached plow.

Figs. 21 and 22 are reversed perspective views, respectively, of the plow-share or plow proper, shown in the form of a scraper, Fig. 22 showing the plow share reinforced as a modification.

Fig. 23 is a cross section of the lower end of the plow-share, modified in construction.

Fig. 24 is a similar section showing a rubber scraper attached to the plow-share.

Fig. 25 is a detached perspective view of a portion of said rubber scraper.

Fig. 26 is a perspective view of one of the uprights of the plow-frame and its associated reach or anchor bar, in modified form.

Fig. 27 is a still further modification of the same.

Fig. 28 is a plan view of the plow-frame showing the same equipped with a bracing device to prevent lateral flexing under heavy strain, such as may be encountered by using the plow in public service, for instance when engaged in street work.

Fig. 29 is an enlarged plan view of the eccentric means of attaching the front ends of the brace-rods to the reaches or anchor-rods of the plow-frame.

Fig. 30 is a longitudinal section taken on line 30—30, Fig. 29, looking in the direction of the arrow crossing said line.

Fig. 31 is a front elevation of the plow-frame attached to a bumper by its regular or preferred support.

Having reference to the drawings in detail, the letter A designates an automobile to which my improved plow is shown attached. B is the chassis of the automobile having the two side members *b* braced, trussed, or otherwise connected together in the usual manner to maintain their spaced relationship; and C is the front bumper of the automobile which is fixedly attached to the front ends of the side members *b* of the chassis so that shocks and strains applied to the bumper will be transferred directly to the chassis of the automobile without imparting such strains or shocks to other portions of the automobile, particularly the operating mechanism thereof. In its broadest aspect, this bumper may be considered as part of the automobile chassis.

35 designates my improved plow, or scraper as it may be termed when used under a certain adjustment. This plow, in preferred form, comprises a two-part plow share 36, a plow frame 37 hung from or supported by the front bumper C of the automobile, and a reach device, or a reach

frame as used in some instances, designated by the numeral 38. The plow frame is disposed transversely in front of the automobile and comprises two uprights or vertical members 39 spaced apart a considerable distance and detachably connected at the top by a cross member 40 and at the bottom by a cross member 41, the detachable connection being provided to permit of "knocking down" the plow frame so that it may be placed in the trunk or body of the automobile or stored in a comparatively small space elsewhere. The uprights 39 may be of any suitable material, but I prefer to employ angle irons, and preferably weld in the angles thereof and at their upper ends solid blocks 42 from each of which projects a screw-stud 43 turned thereon, threaded thereto, or otherwise fashioned on or applied to said blocks. These blocks are preferably flush with the upper ends of the uprights, and the screw-studs consequently project upwardly from these uprights. The cross member 40 is also preferably constructed of angle iron, and has one web or flange 44 thereof bearing against the upper ends of the uprights and the blocks 42 welded or otherwise fastened thereto, and its other web 45 in contact with the front surfaces of the uprights. This cross member 40 has openings formed therein near opposite ends through which the studs 43 project, and nuts 46, preferably hand nuts, are threaded onto said studs to securely but detachably fasten the upper cross member to said uprights, with portions of the plow share 36 fastened in place simultaneously therewith, as will be hereinafter described. On the front faces of these uprights, near their lower ends, supporting brackets 47 are welded or otherwise fastened. These brackets are angular to provide forwardly-projecting shelf portions, from each of which an upstanding stud 48 projects. On the forwardly-projecting shelf portions of these brackets 47, the lower cross member 41 rests. The inner or rear surface of the depending web or flange 49 of this cross member bears against the front edges of the shelf portions of said brackets. This cross member has openings formed in its other or horizontal web or flange 50 near opposite ends through which the studs 48 project. If desired, these studs 48 may be in the form of screw-studs, similar to the screw-studs 43 passing through the opposite ends of the upper cross member 40, and nuts may be applied thereto to fasten the lower cross member to the brackets 47. Such fastening, however, is not found necessary under one form of my invention. In either event, the lower ends of the uprights 39 will be maintained in spaced relation.

The reach device, in preferred form, comprises two longitudinally disposed bars 51 fastened at their front ends to the lower ends of the uprights 39 of the plow frame, and at their rear ends, to the side members of the chassis some distance in rear of their front ends. For this purpose these bars, which may be termed reaches or anchor bars, are provided with hooks 52 at their rear ends, which may be welded or otherwise fastened thereto and hooked through an opening 53 formed in brackets 54 fastened to the side members of the chassis. Each of these brackets is substantially U-shaped through the greater portion of its length and straddles one of the flanges of a side member *b* of the chassis, the lower flange being easily accessible for this purpose. This bracket is fastened by means of bolts 55 passed through a portion of the bracket

and arranged to impinge against the underside of said flange. In this manner the lower end of the plow frame is stabilized and properly braced to resist all strain applied thereto.

I prefer to construct the reaches or anchor bars 51 in two sections, designated 56, 57, preferably as shown in Figs. 11 and 16, and these I hinge together at their meeting ends and also pivotally connect the front ends of the forward sections 56 to the lower ends of the uprights 39 of the plow frame.

In order to pivotally connect the two sections of each reach or anchor bar together, I weld or otherwise fasten a lug 58 to the underside of the front section 56 at its rear end, as best shown in Figs. 16 and 19, and form a bolt hole 59 through said lug. I also weld an elongated connector-member 60 to the adjacent end of the section 57. This connector-member is U-shaped in cross section and normally straddles both the rear end of the front section 56 and the front end of the rear section 57 to which it is fastened. Through bolt holes in the sides of this connector member and the bolt hole 59 in the lug 58, a pivot bolt 61 is secured. This permits the front and rear sections of the reaches or anchor bars to be folded, as shown in Fig. 16, so that they are approximately one-half their normal length. For the purpose of pivoting the front sections 56 of these reaches or anchor bars to the uprights 39 of the plow frame, I weld or otherwise secure lugs 62 to the upper surfaces of said reaches or bars at their front ends. The said front ends and the lugs thereon normally fit into the angles of said uprights and between the side webs or flanges 63 of the latter and reinforcing pieces 64 welded to the inner edges of the front webs or flanges 65 of the said uprights. These lugs 62 have pin holes therethrough which register with pin holes in said side webs or flanges 63 of said uprights 39 and pin holes in said reinforcing pieces, through all of which pivot pins 66 are passed. Thus the uprights and the front ends of the reaches or anchor bars 51 are hinged together so as to permit said uprights to be folded on the folded or collapsed reaches or anchor bars, as shown in Fig. 16.

Other lugs 67 are welded or otherwise fastened to the upper sides of the front sections of the reaches or anchor bars 51 a short distance in rear of their front ends, and to these are pivotally connected brace props 68 which extend forwardly and upwardly from their hinged connection to said lugs and engage the uprights 39. For this purpose and with a view of preventing accidental disengagement of said brace props from the uprights, I weld triangular abutments 69 to the front webs or flanges 65 of said uprights to be engaged by the free ends of said brace props. These abutments have ribs 70 at their upper ends, underneath which said free ends are positioned. Thus the uprights are firmly retained in a position at right angles to the front sections of the reaches or anchor bars.

The plow frame 37 and the front ends of the reaches or anchor bars are fastened to the front end of the automobile in any approved manner, but preferably by suspending it from the front bumper C. For this purpose, the bumper is preferably provided with a large eye 153 to which are fastened the inner ends of two laterally directed chains 154, the upper ends of which are fastened in any one of a series of openings 155 in the uprights of the plow frame. These chains prevent lateral movement of the plow frame and conse-

quently the plow attached thereto with respect to the automobile to which said plow frame is secured. A supporting chain 156 is employed in the manner shown in Fig. 31. The upper end of this supporting chain is fastened to the eye 153 of the automobile while the lower end is secured to the lower cross bar 41 of the plow frame. In this manner the plow frame is properly supported from the bumper C of the automobile, and in order to position the plow supported by said frame in proper relation to the surface being cleared of snow, I form this supporting chain 156 in two sections, the lower end of the upper section 159 being provided with a screw 160 and the lower section 161 having its upper end provided with a screw 162. These screws are oppositely threaded and are entered into opposite ends of a turn buckle or clevice 163 so as to enable the supporting chain to be lengthened or shortened, as required. This chain support is preferably employed when the plow is set into action.

When, however, the plow is to be moved from one place to another, such as for instance while moving the automobile from the garage to the location where snow is to be cleared away, I may prefer to use hooks 71 which engage the upper edge of the automobile and are secured to the uprights 39 of the plow frame. Provision is made for adjustably connecting the hooks to the side webs or flanges 63 of the uprights, each of which has a vertical series of openings 72 therein to receive an angular threaded portion 73 at the lower end of each hook, this angular portion being entered through any of the desired openings 72 by manually lifting the plow frame with its attached plow so that both are elevated to clear the snow upon the ground. Each hook is then retained in position by threading a thumb nut 74 onto its threaded portion 73 so that it bears firmly against the side face of the upright to which it is secured. When the plow frame and its attached plow share is elevated by engaging the hooks 71 with the bumper, the supporting chain 156 becomes slackened and the entire weight of the plow share is carried by these hooks.

In Figs. 5 and 6 the chain support is omitted, for the sake of clearness so as to better illustrate the manner in which the plow frame and its attached plow share are retained in any desired elevated position, or it may be so used in connection with the hooks that it is only applied when the plow share is to operate in clearing away snow. By using a supporting chain, such as described, it is possible to obtain a very close adjustment of the plow share with respect to the surface to be cleared, and this is of particular advantage when utilizing a plow for scraping skating ponds. When, however, a close adjustment of the plow share is not required, the hooks 71 may be used as the support for the plow frame and its attached share, and by fastening these hooks in the required openings 72, a fairly close adjustment of the plow share to the surface to be cleared may be had, as clearly shown in Fig. 8. In that case, the unthreaded studs 48<sup>a</sup> may be employed instead of the screw-studs 48.

It will therefore be apparent that the chain support shown in Fig. 31 is the preferred support for carrying the plow share and plow frame, and that it may be adjusted to position the plow share with respect to the surface to be cleared, as required. It is also to be understood that al-

though this chain support is the preferred arrangement for supporting the plow share and its frame, these two latter elements may be supported solely by the hook 71, which may have their lower ends entered into any one of the openings 72 in the uprights of the plow frame so as to position the plow share the desired distance from the road surface. Due, however, to the need of spacing the openings, the adjustment of the plow share cannot be as nicely controlled. For this reason I utilize the chain support shown in Fig. 31 as the support for the plow share when the latter is in operating or active position to clear away snow, and use the hooks 71 in connection therewith for the purpose of elevating the plow share so that the automobile to which it is attached can be moved from one place to another without placing the plow share in action.

In the drawings I have shown the undersides of the brackets 47 provided with rollers 75 which travel in contact with the surface over which the plow is passed, and these rollers aid the suspension hooks in maintaining the plow frame at the proper elevation. These may, however, be omitted, as shown in Figs. 11, 26 and 27.

The plow share is preferably formed in two sections 76, 77, and each section is constructed of a sheet of metal of suitable gauge which is straight-lined, or slightly downwardly curved, from its upper end, and near its lower end has a decided forwardly-curved portion 78 which materially adds to the rigidity of the plow share. From the front edge of this curved portion the metal is bent rearwardly, as at 79, thence upwardly and rearwardly as at 80 to form a supporting shelf for the plow share. The supporting shelf 80 thus formed on each section materially stiffens the plow share and permits the use of comparatively thin light-weight material, and the shelf 80 is provided with rearwardly-extending lugs 81 in line with the uprights 39 of the plow frame. Welded or otherwise fastened to the upper side of this shelf and to the rear of the body portion of the plow share are angular reinforcements 82 fashioned at the rear to conform to the shape of the lugs 81 which they overlie. Through each of said lugs 81 and the angular reinforcement 82 associated therewith, stud holes 83 are formed which are to receive the studs 48 extending upwardly from the brackets 47 fastened to the front of the uprights 39. Each of the sections also has a rearwardly-extending flange 84 at its upper end which rests against the upper side of the web or flange 44 of the upper cross member 40 forming part of the plow frame. For this purpose the flange of each section of the plow share is provided with at least two bolt holes 85, 86, respectively, through one of which the co-operating stud 43 on the adjacent upright 39 is passed, depending on the adjustment of the plow share on the plow frame. By means of the hand nuts 46, the plow share is secured firmly to the plow frame. The two sections of the plow share 36 are pivotally connected together in any suitable manner so that they may be brought into alignment, or substantially so, or be disposed at an angle to each other. In preferred form, one of these sections slightly overlaps the other, and the inner end of the rearwardly-extending flange 84 of one section extends over and in contact with the inner end of the rearwardly-extending flange of the other section, and a pivot bolt 87 is passed through the overlapped inner ends of these

flanges. The supporting shelf 80 of one section has its inner end overlying and in contact with the inner end of the supporting shelf of the other section (see Fig. 22), and at this overlying region each shelf is provided with a rearwardly-extending lug 88, a pivot pin 89 being secured in any approved manner to the lower lug and extending freely through the upper lug, said pivot pin projecting upwardly a distance therefrom and being threaded for a purpose to appear hereinafter.

As shown in Figs. 7, 9, 21 and 22, the plow share may be used in substantially a straight-lined manner so that when secured to the plow frame and the latter is fastened to an automobile in the manner described, this plow share may be used as a one-way plow, as shown in Fig. 7, or as a pusher or scraper, as shown in Fig. 9. When used as a one-way plow, the plow share will, upon forward movement of the automobile to which it is attached, direct the snow to one side of the automobile, but it will be made clear hereinafter that this plow share, while in straight-lined condition, may be applied to the plow frame so that the snow may be directed to the opposite side of the automobile. Moreover, as clearly shown in Figs. 1 to 3 and Figs. 4 and 5, the two sections of the plow share may be disposed at an angle to each other with a view of directing the snow simultaneously to opposite sides of the path in which the automobile is traveling.

By reason of the hinged connection between the two members of the plow share, the latter can be easily folded and carried in the automobile.

Each section of the plow share may be constructed as shown in Figs. 23 and 24, in which the sheet from which the section is constructed terminates at the front end of the forwardly-curved portion 78, and a separate blade 90 is welded to the underside of the lower marginal portion of the sheet so that a free rear edge 91 is provided for this blade to enable a rubber scraper 92 to be applied to the plow share. This scraper is intended for scraping the surface of skating ponds, and in the form shown is a molded strip of rubber having a rebent flange 93 at its rear edge to form a receiving groove 94 and a rebent flange 95 at its forward end to form a wider receiving groove 96.

Although this scraper strip is molded to form, it is sufficiently yielding to enable the rebent flange 93 to be fastened over the rear marginal portion of the separate blade 90 and permit the rebent flange 95 to be fastened over the edge of the plow share. Owing to the fact that the plow share has a double thickness of metal at this edge, the groove 96 of the scraper strip is made wider than the groove 94, since the latter has to receive only the single thickness of the separate blade 90. This rubber scraper is therefore resiliently retained on the plow share, and its under side is preferably ribbed or corrugated, as shown at 97, to assure a smoother surface for the skating pond than would otherwise be possible.

In this construction, the supporting shelf is designated by the numeral 80<sup>a</sup>, and it has an upstanding web 98 conforming to the curvature of the plow share, to which it is welded or otherwise secured.

It is to be noted that the plow frame is disposed transversely at a right angle to the line of travel of the automobile when used as a

scraper or pusher, and it is then in a position in close proximity at all points to the plow frame, as shown in Fig. 9. When, however, the plow share is adjusted to direct snow both to the right and left, it assumes a somewhat V-formation with its apex extending forwardly; and when so used, upper and lower distance bars 99, 100, respectively, may be interposed between the apex of the plow share thus adjusted and the plow frame, as clearly shown in Figs. 3, 4 and 5. These distance bars, however, are not found necessary for light work. When used, the upper distance bar 99 has its front end fastened to the plow share by the pivot bolt 87 and the rear end to the plow frame by a bolt 101 passed through an opening 102 formed at a point mid-length of the upper cross member 40 of said plow frame. The lower distance bar 100 has its front end secured to the plow share by means of the pivot pin 89 used to pivotally connect the sections of the plow share together at their lower ends, and at its rear end said lower distance bar is fastened to the plow frame by means of a bolt 103 passed through a bolt hole 104 in the lower cross member 41 of said plow frame.

It may here be stated that when the plow share is adjusted to assume a straight-lined position at a right angle to the line of travel of the automobile, as shown in Fig. 9, the studs 43 projecting from the upper ends of the uprights 39 will be passed through the inner bolt holes 85 formed in the flange 84 at the upper ends of the two sections of the plow share, and when this plow share is adjusted so that the two sections thereof assume a V-formation, as shown in Figs. 4 and 5, the said studs are passed through the outer bolt holes 86 in said flanges. When, however, the plow share is adjusted for directing snow to the right, as viewed in Fig. 7, the two sections of the plow share will be in substantial alinement and the stud 43 at the right-hand end of the plow frame will be passed through the bolt hole 85 near the corresponding end of the flange 84, while a spacer frame 105 is employed to distantly connect the plow share with the opposite end of the plow frame. This spacer frame, best shown in Figs. 6 and 7, has upper and lower connector bars 106, 107 which are joined together by means of uprights 108, 109 and braced by a brace bar 110. These uprights and the brace bar are welded or otherwise fastened to the upper and lower connector bars 106 and 107, thus making a rigid unitary structure interposed between one end of the plow frame and the corresponding end of the plow share. The said spacer frame is therefore only used at one end of the plow.

The rear end of the upper connector bar 106 is fastened to the plow frame by means of the stud 43 projecting therefrom at the same side of the automobile, as shown in Figs. 6 and 7, and the front end thereof is secured to the plow share by means of a bolt 111 passed through the bolt hole 86 in the corresponding end of the flange of the plow share. The lower connector bar 107 may have a stud hole through its rear end through which the stud 48 aligned therewith and extending up through the lower connector bar of the plow frame may be passed, and at its front end it has a stud 112 which passes through a lug 113 extending from the supporting shelf 80 of one section in longitudinal alinement with said stud 48. If desired, an intermediate brace bar 114 may be employed centrally of the plow frame and substantially centrally of the plow

share. When using the brace 114 it is secured to the lower cross member 41 of the plow frame, as indicated by dotted lines 115, Fig. 7, and at its front end it is secured to the supporting shelf of one of the sections of the plow share by a bolt passed through a bolt hole 116, see Fig. 22. Since it may be found necessary at times to direct the snow to the side opposite that shown in Fig. 7, the plow share will be reversed, in which case direct connection of the plow share with the plow frame will be made at the left in Fig. 7, instead of at the right as now shown, and the spacer frame 105 will be employed at the right of Fig. 7 instead of at the left. For this reason the shelf of the other section of the plow share is provided with a lug 117 similar to the lug 113, and the same supporting shelf will have a bolt hole 118 at the opposite side of the pivot 89 for the intermediate brace bar 115.

Since it is the intention to construct the plow share of comparatively light material, I may, in some instances, reinforce it by means of angle iron reinforcing bars 119 extending from the flanges 84 of the plow share to the supporting shelves 80 of the two sections thereof; but this is optional and is illustrated only in Fig. 22.

While I prefer to employ hinged reaches or anchor bars of the type described, these reaches or anchor bars may be formed of angle iron as shown in Fig. 26. In this figure I have shown the reach or bar constructed in two sections; the front section 120 being shown integral with the upright 39 which serves as part of the plow frame and retained in angular relation thereto by a brace 121, while the rear section 122 has an upwardly-directed extension 123 integral therewith and provided with a hook 124 by means of which it may be connected with the retainer bracket 54 on the chassis, or any other retainer device suitable for the purpose. If desired, the front section may be separate from the upright 39 and be secured thereto in any suitable manner, and the upwardly-directed extension 123 may be separate from the rear section and secured thereto by welding or otherwise. In the form shown, the extension 123 is braced to the horizontal or substantially horizontal portion of the reach or anchor bar by a brace plate 125 welded to both of such parts. The front and rear sections are pivotally connected by a pivot pin 126 passed through the upright flanges of said sections, and said sections are held in alinement by a bolt 127 passed through these flanges.

If desired, these reaches or anchor bars may be constructed of tubing, as shown in Fig. 27, in which case they may also be formed in two sections of different diameters, the smaller 128 of which is telescoped into the larger 129. The front end of one of said sections is welded or otherwise suitably secured to the upright 39 of the plow frame, as at 130, and the rear end of the other section is welded or otherwise secured at 131 to an adjustable angular extension or upright 132 constructed of two members of angle iron arranged to fit one into the other, each having a series of holes 133 through which securing bolts 134 are passed. This adjustable extension or upright may be used on any type of reach or anchor bar where it is found desirable, due to the variation in the height from the ground to the side members of the chassis, and these adjustable uprights may be secured to the side members of the chassis in any approved manner. The large section 129 of the anchor bar or reach has a bolt 135 passed therethrough

at its rear end which is to be selectively entered in one of a series of openings 136 formed in the small section 128. Thus the reach or anchor bar may be varied in length to meet any requirement.

On occasions, and more particularly when a plow is designed for utility purposes, such as cleaning streets or where other similar heavy duty work is encountered, it may be found necessary to connect and brace the reaches or anchor bars and thus convert the reach device into a reach frame, as for instance shown in Fig. 28, wherein the reaches or anchor bars are designated by the numeral 137, the front ends of which are welded or otherwise secured to the uprights 39 of the plow frame, while the rear ends may be secured to uprights 138 provided with securing hooks 139 at their upper ends for connection with the chassis of the automobile. In this particular figure the reaches or anchor bars 137 are constructed of angle iron, and near the front ends thereof upstanding lugs 140 are welded or otherwise fastened to the horizontal webs or flanges of the reaches or bars. Spaced some distance from these lugs are upstanding lugs 141 which are notched from their upper ends downwardly to receive bolts 142 which are threaded into the outer ends of an adjustable cross bar 143. This cross bar is formed in two sections 144, 145, and the inner ends of these sections are connected by an adjusting screw 146 having right and left hand threads at opposite sides of its center. Centrally of this adjusting screw is a polygonal enlargement 147 by means of which the screw may be adjusted so that the two reaches or anchor bars 137 of this reach frame will be properly spaced apart and permanently held in such spaced relation as may be required by the spacing of the side members of the automobile chassis to which this reach frame is to be secured. At their outer ends, each of the sections 144 and 145 has a forwardly-extending lug 148 and to these lugs the rear ends of diagonal braces 149 are pivotally secured. These braces have adjustable bolts 150 threaded into their front ends, and pivotally secured to the outer extremities of these bolts are cam levers 151 which work against the concaved face of the curved upstanding lugs 140. These lugs are provided with notches 152 opening downwardly from their upper edges through which the adjustable bolts 150 are passed. These bolts are so adjusted in the diagonal braces 149 that a comparatively close fit is provided of the cam portions of the cam levers with the upstanding portions of the lugs 140, and upon pulling inwardly on said levers, the throws of the cams will be tightened against the concaved faces of said lugs and strain the diagonal braces 149 in a forward direction, thereby tightening the brace device thus constructed and rigidly connecting and maintaining the reaches or anchor bars in desired relation. This brace device can be quickly removed from the reaches or anchor bars and be as readily applied, and when detached from said reaches or bars can be folded for storage in the automobile, or elsewhere. It is apparent that this brace device may be otherwise constructed without departing from the principle underlying the construction described.

While the bracing of the reaches or anchor bars just described assures a very rigid structure and may not ordinarily be required for light work, nevertheless such a reach structure may be adopted as standard and the omission of the

braces and associated parts would in no manner create a departure from my invention as set out in the claims hereof. The reaches or anchor bars, or the reach structure as it may be termed, could and in most instances is intended to be a knock-down structure, regardless of whether or not the braces and their associated parts were employed, and in either case would be capable of reduction in size whether by folding or otherwise, so that the various parts of the reach structure and the plow frame could be placed in the trunk portion of an ordinary passenger car.

Having thus described my invention, what I claim is:

1. The combination with an automobile, of a collapsible frame applied to the front of the automobile, a plow share removably supported by said frame, and rigid means bracing said plow share against rearward movement under operating strain and collapsible with said frame so that the frame and said bracing means may be stored in the automobile, and means to normally hold said frame in operative position relative to said bracing means, said bracing means and frame being pivotally connected together and said bracing means having connection with said chassis at points distant from said plow.

2. The combination with an automobile chassis and a bumper secured to said chassis, of a plow comprising a plow frame detachably secured to said bumper, a plow share removably secured to said plow frame, reaches pivotally connected at their front ends to the lower end of said plow frame and having connection at their rear ends with side members of said chassis at points distant from said plow frame, and means to normally hold said plow frame in operative position relative to said reaches, said plow frame and reaches being collapsible to permit parts of one to be folded with the other and said reaches being foldable to permit said frame and reaches to be folded into compact space.

3. The combination with an automobile chassis and a bumper secured to said chassis, of a plow comprising a plow frame adjustably supported by said bumper to permit of adjusting the plow vertically, retainer brackets secured to side members of said chassis at points distant from their front ends, anchor bars pivotally connected at their forward ends to the lower ends of said plow frame and detachably with said retainer brackets, means to normally hold said plow frame in operative position relative to said anchor bars, said anchor bars and parts of said plow frame being foldable one on the other, and a plow share detachably secured to said plow frame.

4. A plow, comprising a plow frame adapted for attachment to the front end of an automobile, anchor bars pivotally connected at their front ends to the lower ends of said plow frame and comprising two pivotally connected sections to permit said sections to be folded one on the other and the plow frame to be folded on the folded sections, and a plow share removably applied to said plow frame.

5. In an attachable plow for vehicles, a plow frame formed of uprights and upper and lower cross members detachably connecting the upper and lower extremities of said uprights to permit of knocking-down said plow frame, means on said plow frame for attachment to a vehicle, anchor bars pivotally connected at their front ends to the lower ends of said uprights and adapted for connection at their rear ends to the side members of the vehicle, means to normally hold said

uprights in operative position relative to said anchor bars, and a plow share removably secured to the upper and lower ends of said plow frame.

6. A plow for attachment to automobiles, comprising a plow frame adapted for attachment to an automobile, anchor bars pivotally connected at their front ends to the lower ends of said plow frame and adapted to have their rear ends connected to side members of the chassis of the automobile, brace props pivotally connected to said anchor bars and extending diagonally to said plow frame with their free ends engaging the latter, and a plow share detachably fastened to said plow frame.

7. The combination of a collapsible plow frame adapted to extend transversely across the front of an automobile and be detachably secured thereto, reaches reducible in length and foldable with parts of said plow frame and adapted for connection with the chassis of an automobile, means to normally hold said plow frame in operative position relative to said reaches, and a plow share detachably and adjustably connected to said plow frame to permit of disposing said plow share at either of two opposite angles so as to direct snow either to the right or left of the path along which the plow is moved.

8. The combination with an automobile chassis and a bumper secured to said chassis, of a plow comprising a plow frame, retainer means adjustably secured to said plow frame and adapted for connection with said bumper, anchor bars pivotally connected at their front ends to the lower end of said plow frame to permit of folding the two together without disconnecting one from the other and having connection at their rear ends with the side members of said automobile chassis, means to normally hold said plow frame in operative position relative to said anchor bars, said anchor bars being normally extended and rigidly connected and reducible in length for storage and a plow share secured to said plow frame.

9. The combination with an automobile having a bumper secured to its front end, of a plow comprising a plow frame extending transversely in front of said bumper and having means of connection therewith permitting said plow frame to be raised or lowered, a reach pivotally connected with said plow frame to permit of folding the two together while maintaining their connected relation, means to normally hold said plow frame in operative position relative to said reach, and a plow share having interchangeable connection with said plow frame to permit said plow share to be used as a pusher or scraper, as a means of directing the snow to either side of the automobile, or as a means of directing the snow to both sides of the automobile.

10. The combination with an automobile, of a plow comprising a plow frame extending transversely in front of said automobile and having connection therewith, said plow frame including two uprights, connector bars detachably connecting the upper and lower ends of said uprights, collapsible anchor bars pivotally connected at their front ends to the lower ends of said uprights so as to be foldable without disassociating one from the other and having their rear ends attached to the automobile a distance from its front end, means to normally hold said uprights in operative position relative to said anchor bars, said anchor bars when collapsed being reduced in length and said uprights being foldable on the

collapsed anchor bars when said upper and lower cross members are detached therefrom, and a plow share detachably secured to said plow frame.

11. The combination with an automobile, of a plow having a plow frame extending transversely in front of said automobile, and means for detachably securing said plow frame to said automobile including anchor bars extending rearwardly from the lower end of said plow frame and formed in sections, one section of each anchor bar having a U-shaped connector member secured thereto and the adjacent end of the other member lying therein and pivotally connected therewith to permit the folding of said anchor bar, and a plow share detachably connected to said plow frame.

12. The combination with an automobile, of a plow comprising a plow frame extending transversely in front of said automobile and having connection with the front end of said automobile and means foldably attached to its lower end for connection with said automobile a distance from its front end, means to normally hold said plow frame in operative position to said foldably-attached means, means of connection between opposite sides of said plow frame and the front end of said automobile at a central point to prevent lateral displacement of said plow frame with respect to the longitudinal center of the automobile, and a plow share secured to said plow frame.

13. The combination with an automobile chassis and a bumper secured to said chassis, of a plow comprising a plow frame extending transversely in front of said bumper, a chain connecting said plow frame at its lower end with said bumper including means to lengthen or shorten said chain, transversely-directed chains secured at their inner ends to said bumper and at their outer ends to the side portions of said plow frame, means to otherwise connect said plow frame with said automobile to resist rearward movement of said plow frame when the plow is in operation, and a plow share secured to said plow frame forward of the latter.

14. The combination with an automobile having a chassis provided with side frame members, of a collapsible plow frame secured to the forward end of said automobile, a reach device pivotally connected with said plow frame and extending rearwardly therefrom for connection with said side frame members, said reach device being reducible in length and foldable on said plow frame while maintaining its relation thereto, means to normally hold said plow frame in operative position relative to said reach device, and a plow share detachably secured to said plow frame and formed in sections to permit of reducing the same in length.

15. The combination with an automobile having a chassis provided with side frame members, of a plow frame detachably secured to the front end of said automobile, a reach device foldably and non-detachably connected with the lower end of said plow frame to permit the two to be folded together for storing in the automobile when not in use, said reach device extending rearwardly from said plow frame for detachable connection with said side frame members, means to normally hold said plow frame in operative position relative to said reach device, and a plow share detachably secured to said plow frame.

16. A plow for attachment to an automobile, comprising a plow frame adapted for attachment to the automobile, anchor bars pivotally connected at their front ends to the lower ends of said

plow frame and adapted to have their rear ends detachably connected to side members of the chassis of the automobile, said plow frame having detachably connected side members and each of the latter being non-detachable yet foldable with an anchor bar, means to normally hold said detachably connected side members in operative position relative to said anchor bars, and a plow share detachably fastened to said plow frame.

17. The combination with an automobile, of a plow frame extending across the front of the

5 automobile, a flexible element attached at one end to a high point of the automobile and at its other end to a low point of said plow frame, said flexible element being adjustable in length, transversely-disposed flexible elements connecting the front of the automobile at a central point with opposite ends of said plow frame, and a plow share detachably connected to said plow frame.

10

EDWARD L. WIEDMAN.