

June 28, 1938.

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2,121,960

WING CRANE FOR SNOW PLOWS

Filed April 27, 1937

2 Sheets-Sheet 1

FIG. 1.

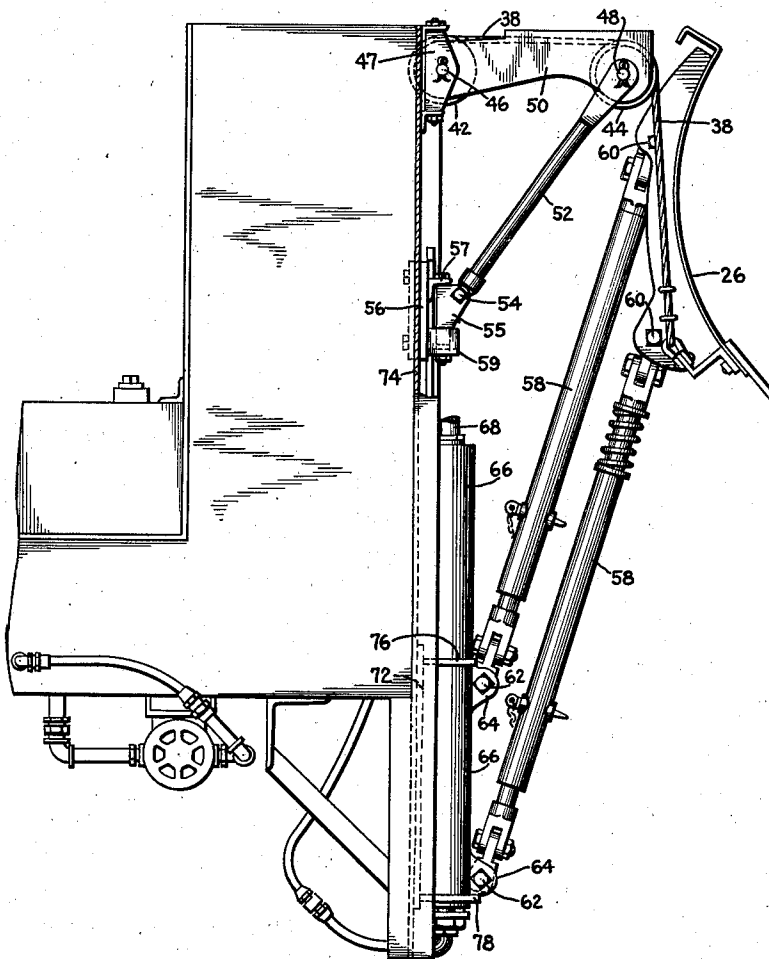


FIG. 2.

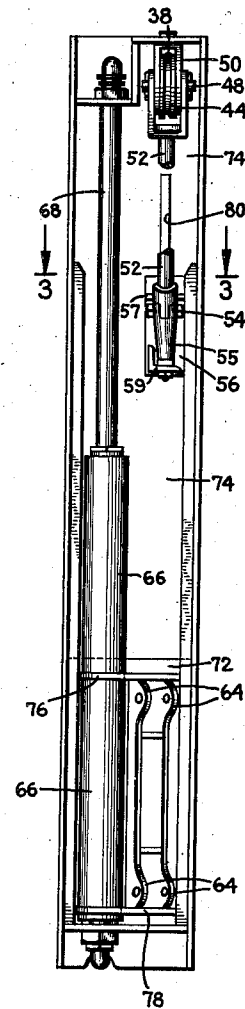
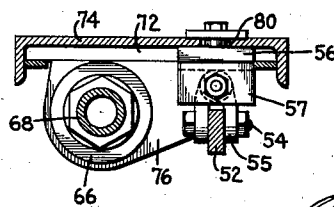


FIG. 3.



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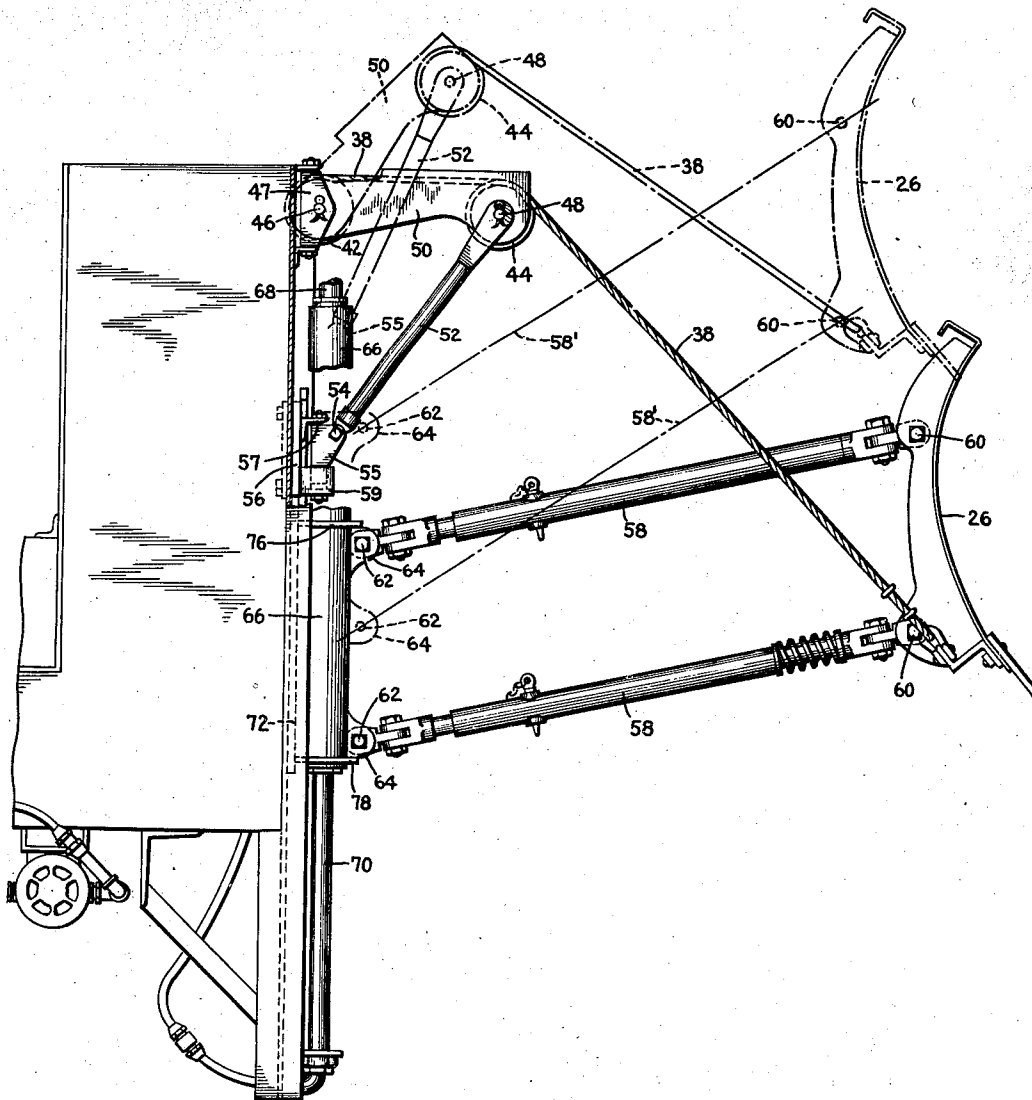
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FIG. 4.



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WING CRANE FOR SNOW PLOWS

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Application April 27, 1937, Serial No. 139,125

5 Claims. (Cl. 37—42)

The present invention pertains to snow plows of the type disclosed in my copending application Serial No. 108,920, filed November 3, 1936.

That machine has a levelling wing and a crane for raising and lowering the rear end of the wing. The over-all height of a machine of that kind is sharply limited in practice by the overhead clearances of bridges, garage doors and the like. This prevents building the wing crane as a fixed structure high enough to permit raising the rear end of the wing as high as is sometimes required in service.

An object of the present invention is to overcome the above structural requirements by providing a crane which will automatically increase its height when the operator wishes to raise the wing to a height above the normal range of operation, and which will automatically return its height to normal when the operator lowers the wing to normal operating range.

Another object is to accomplish the above without the use of long crane jibs or booms, thus retaining compact arrangement of the original structure, and avoiding interference with the sides as well as the tops of garage door openings.

Further and other objects and advantages will be apparent from the specification and claims, and from the accompanying drawings which illustrate what is now considered the preferred embodiment of the invention.

Fig. 1 shows the parts in fully retracted position.

Fig. 2 is a view of Fig. 1 from the right with wing and its struts removed.

Fig. 3 is a cross-section on line 3—3 of Fig. 2.

Fig. 4 shows, in solid lines, the wing and its struts extended to a normal operative position, and also shows in broken lines the wings, struts and crane raised to a temporarily abnormal height.

Referring to the drawings, 26 is the levelling wing. The front end of the wing is vertically adjustable by means not illustrated. The rear end of the wing is adjustable vertically by cable 38 passing over sheaves 42, 44. Sheave 42 is mounted for rotation on pin 46 in bracket 47 on the frame of the machine. Sheave 44 is mounted for rotation on pin 48 in the outer end of boom 50, which is adapted for vertical swinging motion about pin 46 under control of jib 52. The upper end of jib 52 is bifurcated and engages pin 48, while the lower end of the jib is pivotally supported on pin 54 in bracket 55, which is joined to a crosshead 56 by upper and lower angle plates 57 and 59. Brackets 47 and 55 are piv-

otally mounted to permit boom 50 and jib 52 to swing horizontally. The rear end of the wing is held in operative position spaced away from the truck by one or more struts 58, 58. The ends of the struts are provided with universal joints by which their outer ends are connected to the wing at 60 and by which their inner ends are connected at 62 to ears 64 attached to the exterior of hydraulic cylinder 66, which is movable vertically under control of the operator in order to maintain the struts in the most advantageous positions for resisting the forces tending to move the wing upwardly or downwardly, and inwardly towards the truck.

Within cylinder 66 is a piston (not shown) from which extend upwardly and downwardly hollow piston rods 68 and 70, which are supported by the frame of the machine at their upper and lower ends, respectively. The two piston rods form, in effect, a single rod with the piston near the middle thereof.

In operation, oil under control of the operator is forced through the piston rods into the cylinder above or below the piston, thus raising or lowering the cylinder and the ends of the struts 58 attached thereto. The cylinder is provided with a crosshead 72 which transmits the thrust of the struts to vertical guide 74 (Fig. 3). Plates 76, 78 connect the cylinder to top and bottom of crosshead 72. Crosshead 56, which supports the lower end of jib 52, is also adapted for vertical movement guided by slot 80 (Fig. 2) in guide plate 74.

With the above structure in mind, the invention will be readily understood. Under normal conditions, cylinder 66, struts 58, wing 26, boom 50, jib 52, and related parts, will operate below their full-line positions of Fig. 4.

On occasion it is necessary to raise wing 26 to an abnormally high position, as indicated by the broken lines in Fig. 4. The inboard ends of struts 58 may readily be raised to that position as indicated by center lines 58'—58', by simply raising cylinder 66 to the position indicated by the dotted ears 64 (Fig. 4). However, the raising of the wing itself and the outer ends of the struts is not so simple because if sheave 44 be not raised the tension in cable 38 will not have sufficient vertical component of lift. This difficulty is overcome automatically by this invention when cylinder 66 moves to its extra high position, because during that movement crosshead 72, attached to the cylinder, engages the bottom of crosshead 56 and pushes that crosshead upwardly, guided by slot 80, until boom 50, jib 52, sheave 44

and cable 38 assume an elevated position as indicated by the broken-lines of Fig. 4. When cylinder 66 is lowered again, all the members assume their normal full-line positions of Fig. 4 or 1.

5 It is to be understood that the invention is not limited to the specific embodiment herein illustrated and described, but may be used in other ways without departure from its spirit as defined by the following claims.

10 I claim:

1. In snow plow apparatus mounted on a motor truck, a levelling wing, a strut for holding said wing away from said truck, separate means for vertically adjusting the outer and inner ends of said strut, and means effective under 15 certain conditions for operatively interconnecting said separate adjusting means whereby operation of one of them will adjust both ends of said strut.

2. In snow plow apparatus mounted on a motor truck, a levelling wing, a strut for holding said wing spaced from said truck, a hydraulic device for vertically adjusting the inner end of said strut, means including a crane for adjusting the other end of said strut, and means operable under 25 certain conditions for interconnecting said adjusting devices whereby operation of said hydraulic device will also adjust the outer end of said strut through the instrumentality of said crane.

3. In snow plow apparatus mounted on a motor truck, a levelling wing, a strut for holding said

wing spaced from said truck, a hydraulic device for vertically adjusting the inner end of said strut, means including a crane for adjusting the outer end of said strut, said crane having a head sheave, and means operable under certain conditions for interconnecting said adjusting devices whereby operation of said hydraulic device will move said sheave to a new operative position, for the purpose set forth. 5

4. In snow plow apparatus mounted on a motor truck, a levelling wing, a strut for holding said wing spaced from said truck, a vertically movable hydraulic cylinder for adjusting the inner end of said strut, a cable-type crane for adjusting the outer end of said strut, said crane having 15 a head sheave held in operative position by a jib and a boom, and said cylinder being effective when it reaches a predetermined height for moving said jib and boom to place said sheave in a new operative position, substantially as described. 20

5. In a snow plow apparatus mounted on a motor truck, a levelling wing, a strut for holding said wing away from the truck, means for vertically and independently adjusting the ends of said strut to maximum normal operative heights, 25 means for vertically raising said strut at its truck end to a position above said normal maximum, and means operable during such raising operation for simultaneously adjusting the other end of said strut to an abnormal height. 30

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