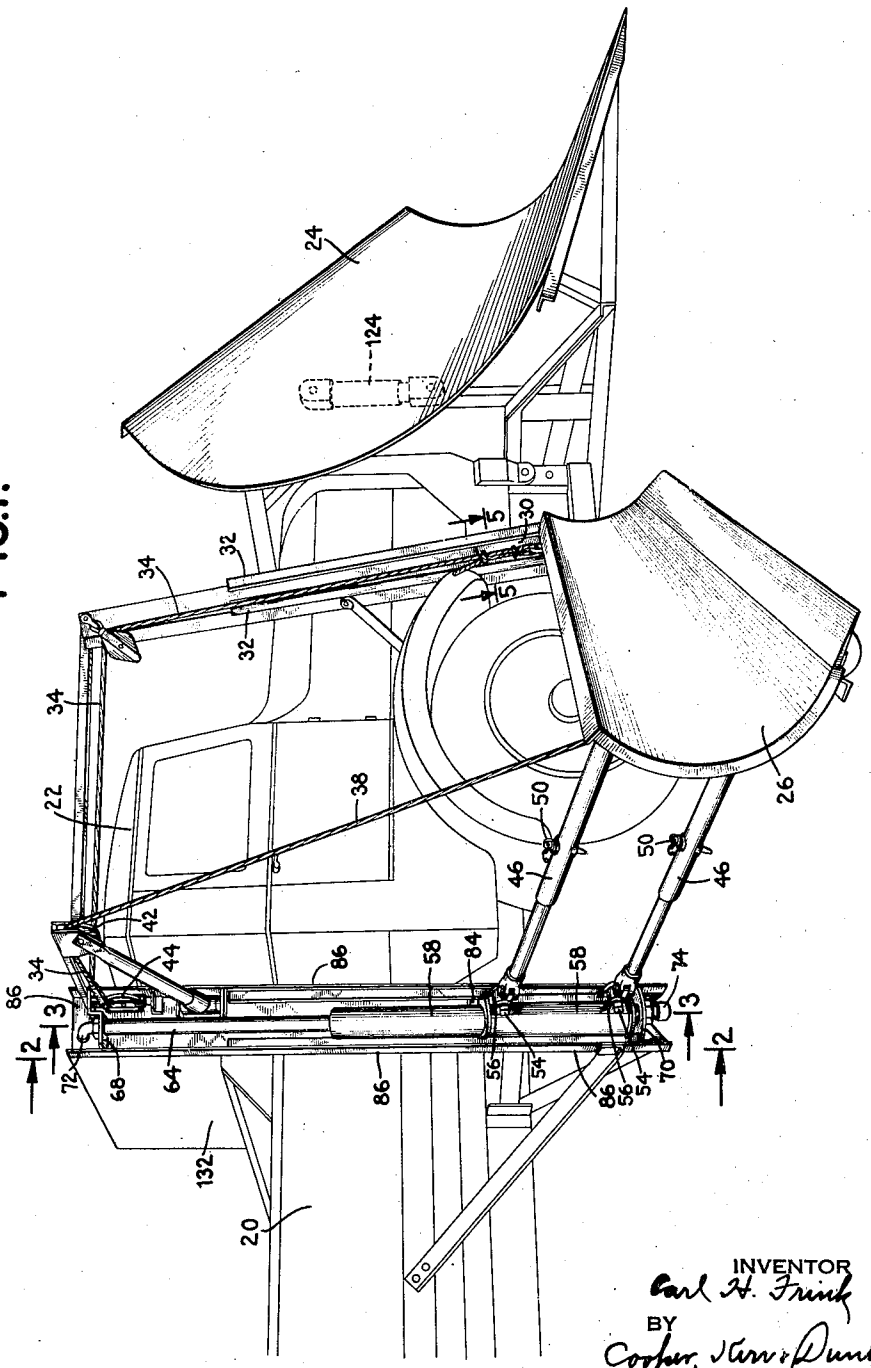
March 12, 1940. C. H. FRINK 2,193,532

WING CONTROL FOR SNOW PLOWS

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FIG.1.



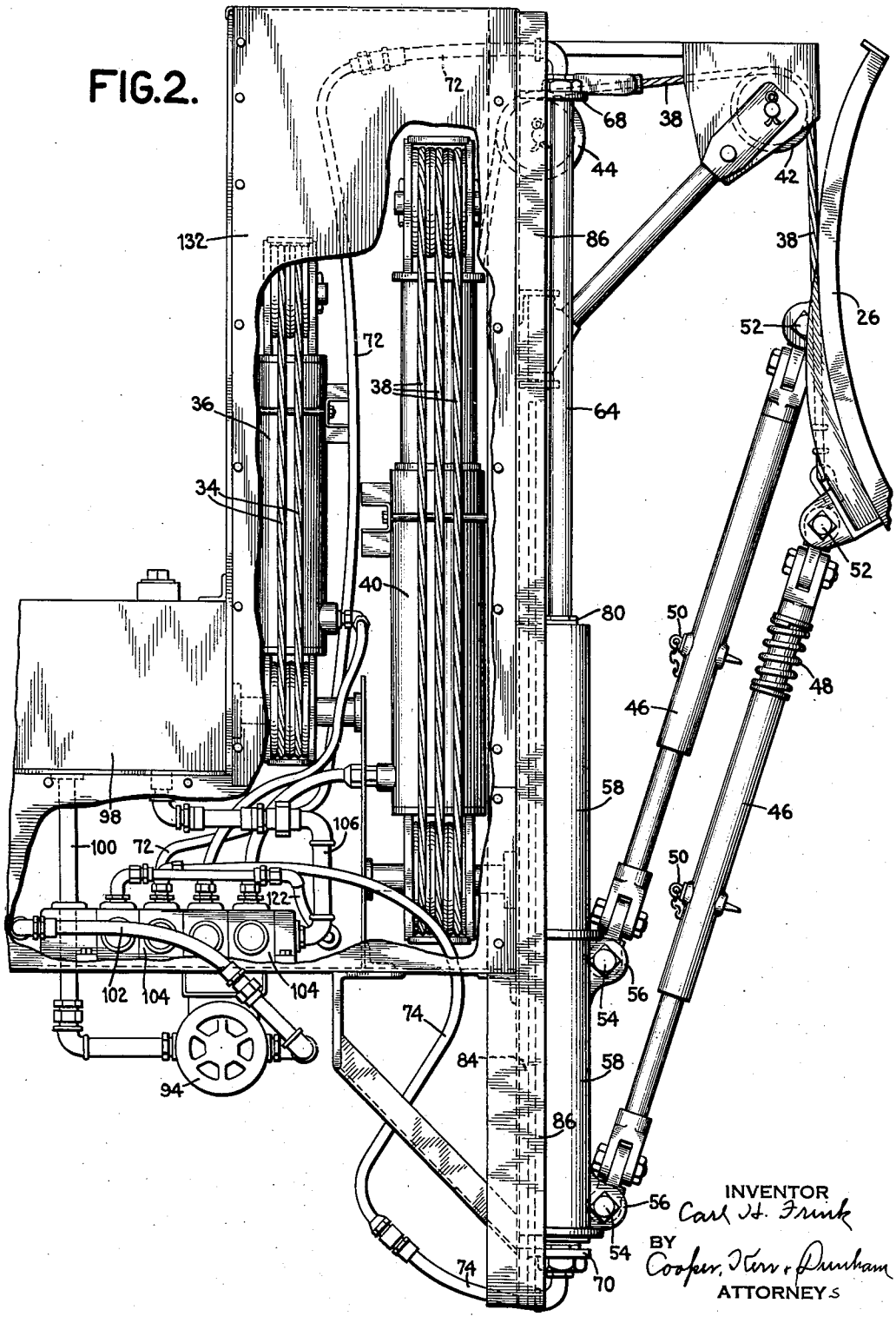
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WING CONTROL FOR SNOW PLOWS

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FIG.2.



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FIG.3.

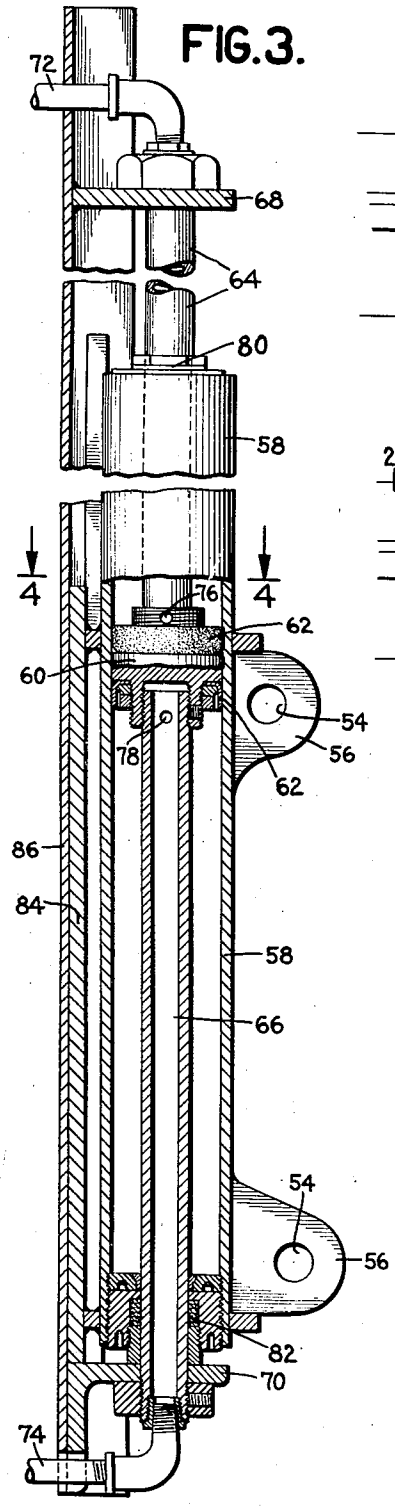


FIG.6.

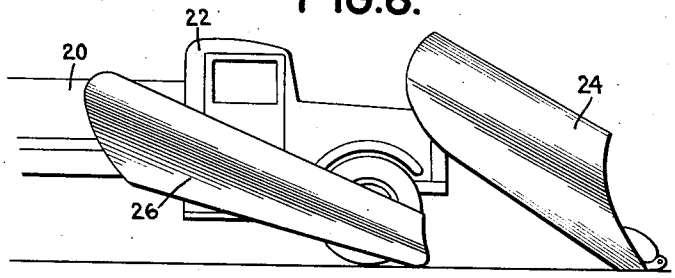


FIG.7.

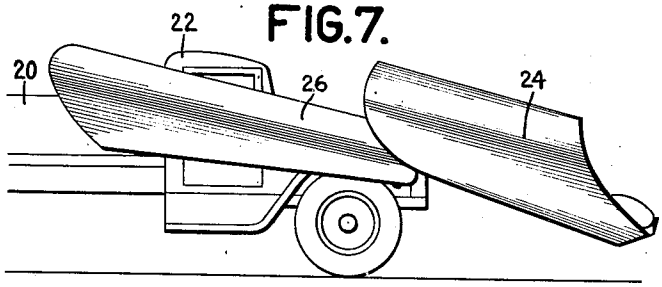
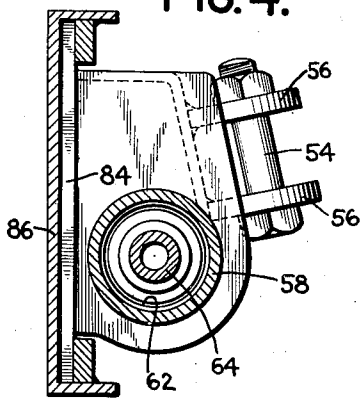


FIG.4.



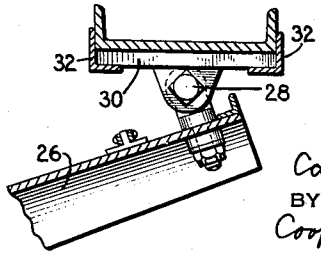


FIG.5.

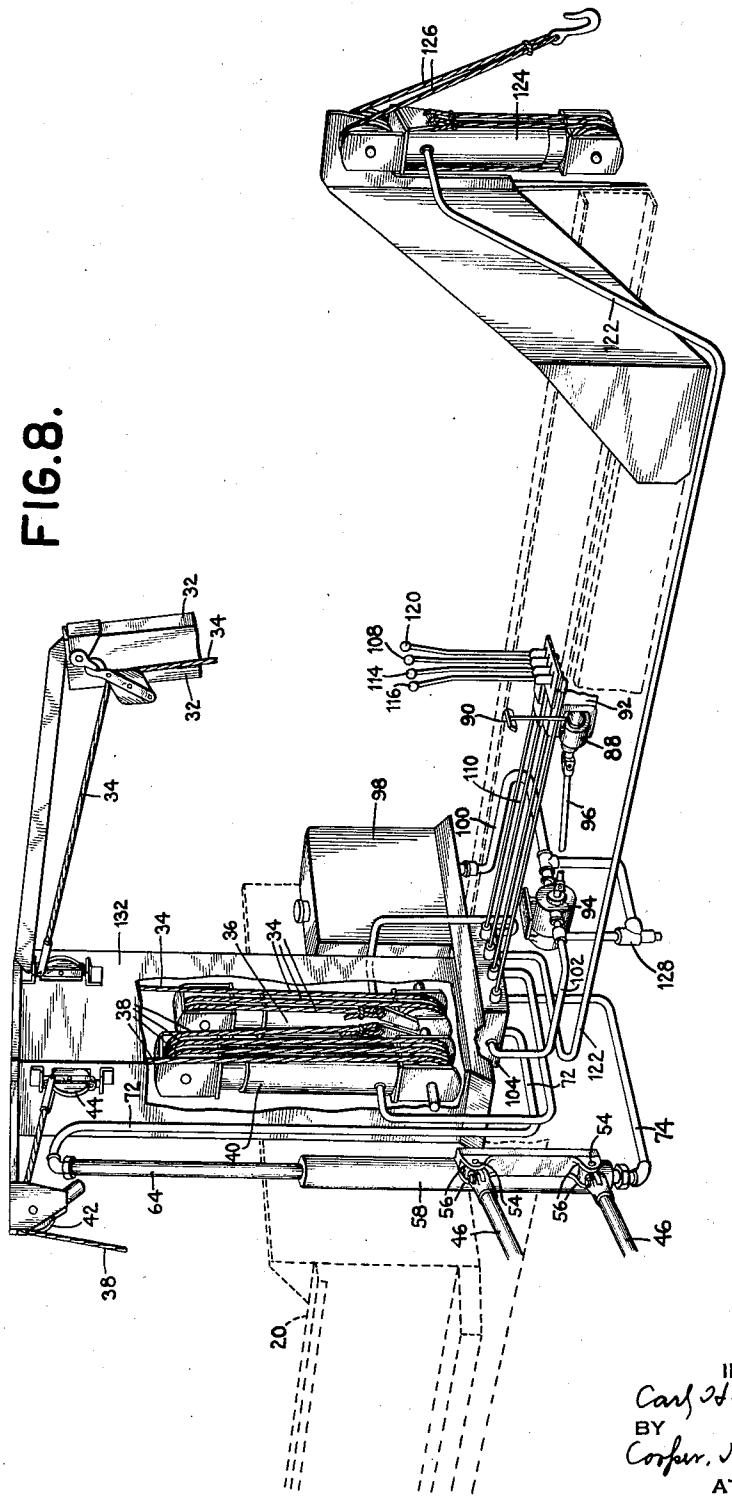
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WING CONTROL FOR SNOW PLOWS

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FIG. 8.



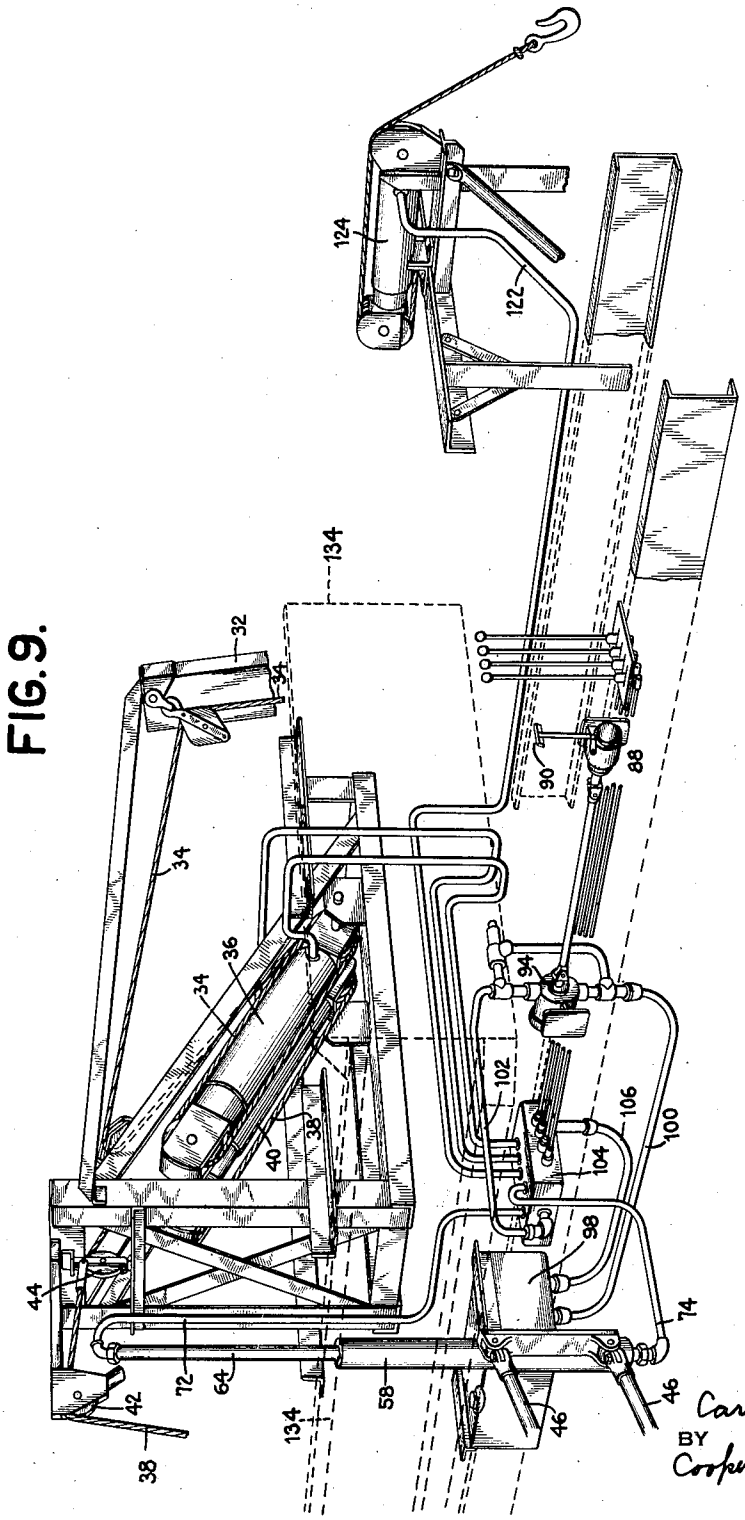
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FIG. 9.



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Patented Mar. 12, 1940

2,193,532

UNITED STATES PATENT OFFICE

2,193,532

WING CONTROL FOR SNOW PLOWS

Carl H. Frink, Clayton, N. Y.

Application November 3, 1936, Serial No. 108,920

2 Claims. (Cl. 37—42)

This invention pertains to apparatus of the type in which a motor truck is equipped at its front end with a snow plow and at its sides with wings for levelling or otherwise controlling the snow at the sides of the road. The plow at the front of the machine is adjustable vertically, and the wings are adjustable to various angles and positions to best suit the particular conditions in operation, and an object of the invention is to provide means for adjusting the wings to various operative positions quickly and positively so that there may be no necessity for slowing down the truck even at speeds of 30 to 40 miles per hour when obstructions such as bridge walls, mail boxes, or the like must be avoided.

More particularly, an object of the invention is to disclose means for hydraulically adjusting the position of the struts connecting the rear ends of the wings to the truck, and for adjusting the positions of the wings themselves.

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 is a general view of the apparatus.

Fig. 2 is a view on line 2—2 of Fig. 1.

Fig. 3 is a view on line 3—3 of Fig. 1 showing details of the strut-adjusting cylinder.

Fig. 4 is a cross-section on line 4—4 of Fig. 3.

Fig. 5 is a cross-section on line 5—5 of Fig. 1.

Fig. 6 is a side view of the apparatus with the nose plow in operative position, with the front end of the wing down and the rear end of the wing raised.

Fig. 7 is a view similar to Fig. 6 but showing the nose plow and both ends of the wing raised.

Fig. 8 is a view showing diagrammatically the control mechanism of the embodiment of Fig. 1.

Fig. 9 is a diagrammatic view of a modified arrangement of the invention.

Referring to Figs. 1 and 2, the body and cab of the truck are designated 20 and 22, respectively, 24 is the nose plow and 26 is the right-hand wing. The front end of the wing is pivotally attached, as at 28 (Fig. 5) to a cross-head 30 vertically adjustable in guides 32 by means of cable 34 actuated by hydraulic cylinder 36, as will be readily understood from Figs. 1, 2 and 8, the cable passing around sheaves on plunger and cylinder, in well known manner.

The rear end of wing 26 is adjustable vertically by cable 38 actuated by hydraulic cylinder 40 and passing around sheaves 42, 44 and the usual sheaves at the ends of cylinder 40.

The rear end of the wing is held in operative position away from the truck by one or more telescopic struts 46, 46. These struts provide some resiliency to the wing by means of a compression spring 48, and the struts are manually adjustable in length by means of pin 50 which may be placed in selected holes provided for the purpose through the telescopic member.

The ends of the struts are provided with universal joints, the outer ends being connected to the wing at 52 (Fig. 2), and the inner ends being connected at 54 to lugs or ears 56 attached to the exterior of hydraulic cylinder 58 which is movable vertically, as will be explained, in order to maintain struts 46 in the most advantageous position to resist the forces tending to move the wing upwardly or downwardly and inwardly towards the truck.

Operation of cylinder 58 will be understood from Fig. 3. Within the cylinder is a piston 60 fitted with cup leathers 62, which prevent passage of liquid past the piston in either direction. Extending upwardly and downwardly from piston 60 are the hollow piston rods 64 and 66, held to the frame of the machine at their upper and lower ends at 68 and 70, respectively. The two piston rods form in effect a single rod with the piston near the middle thereof.

Oil is conducted to or from the hollow rods by pipes 72 and 74, and passes from the hollow rods into the upper or lower compartment of cylinder 58 through holes 76 and 78 in the rods. Since piston 60 is stationary, the forcing of oil into the upper or lower end of the cylinder through holes 76 or 78 will tend to raise or lower the cylinder and the ends of the strut or struts attached thereto. Suitable stuffing boxes 80, 82 are provided at the upper and lower ends of the cylinder around the piston rods. The cylinder is provided with a cross-head 84 which transmits the thrust of the struts to vertical guides 86 (Fig. 4).

Construction and operation of the control devices may be understood from Figs. 8 and 2. A power take-off 88, under control of a foot lever 90, and attached to the truck transmission 92, drives a pump 94 through shaft 96. The pump normally simply circulates oil from tank 98 through pipe 100, pipe 102, valve chest 104 and pipe 106, back to the tank. But if, for example, the operator wishes to raise cylinder 58, he will move lever 108 (Fig. 8) to its forward position, which movement, through rod 110, shuts off the return of oil through pipe 106 in the tank and forces the oil under high pressure through pipe

72 (Fig. 2) into the upper end of cylinder 58, raising the cylinder and its attached struts, as already explained. At the same time oil in the lower end of cylinder 58 is forced out through pipe 74. When cylinder 58 has reached the desired position the operator releases lever 108 whereupon the lever returns automatically to normal position, thereby locking the oil in cylinder 58 and holding the cylinder in its adjusted position. Moving lever 108 to the rear reverses the flow of oil and causes cylinder 58 to move downwardly.

In substantially similar manner levers 114 and 116 control flow of oil to cylinders 36 and 40 to raise, hold, or lower the wing at front and rear, respectively. Lever 120 controls flow of oil through pipe 122 to cylinder 124, which acts through cable 126 to raise, hold, or lower the nose plow. Relief valves, as at 128 (Fig. 8) or 130 (Fig. 2) protect the system against abnormal high pressures in case a control lever is held too long in an operative position.

The preferred arrangement of the above described apparatus is as shown in Fig. 1, with the pump control valve and wing control cylinders in a unitary structure enclosed within or attached to a housing 132 located between truck body and cab 22. But the various units comprising the system may, if necessary, be placed in any convenient locations. One such arrangement is shown in Fig. 9, in which the front and rear wing adjusting cylinders are placed in an inclined position in the front of a truck body 134, the arrangement being easily understood without detailed description.

In practice, one man usually drives the truck, and another manipulates levers 108, 114, 116 and 120. The apparatus has been found very efficient in service. The lengths of struts 46 are manually adjusted beforehand and then after a run starts all adjustments of nose plow or wings may be made while the truck is moving at high speed.

The invention has been described as applied to a wing located at the front of the truck, but it may be applied, with obvious modifications, to a wing placed further toward the rear, and may, of course, be used with wings on both sides of the truck.

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.

I claim:

1. In snow plow apparatus mounted on a motor truck, a levelling wing pivoted at its front end to the truck, a strut between the rear end of said wing and the truck for holding the rear end of said wing away from the truck, and a hydraulic device comprising a vertical stationary piston rod having a piston near the middle of its length, a cylinder enclosing said piston and movable vertically on said rod relatively to said piston, the truck end of said strut being attached to said cylinder, and means under control of the operator for admitting liquid under pressure into said cylinder above or below said piston whereby said cylinder and the end of the strut attached thereto are vertically adjustable, substantially as described.

2. The invention set forth in claim 1, in which said piston rod is hollow above and below said piston and the liquid is introduced into the cylinder through said rod at points immediately above or below said piston.

CARL H. FRINK.