Feb. 9, 1937. F. E. BROWN 2,070,153

SNOW PLOW HOIST

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Fig. 1.

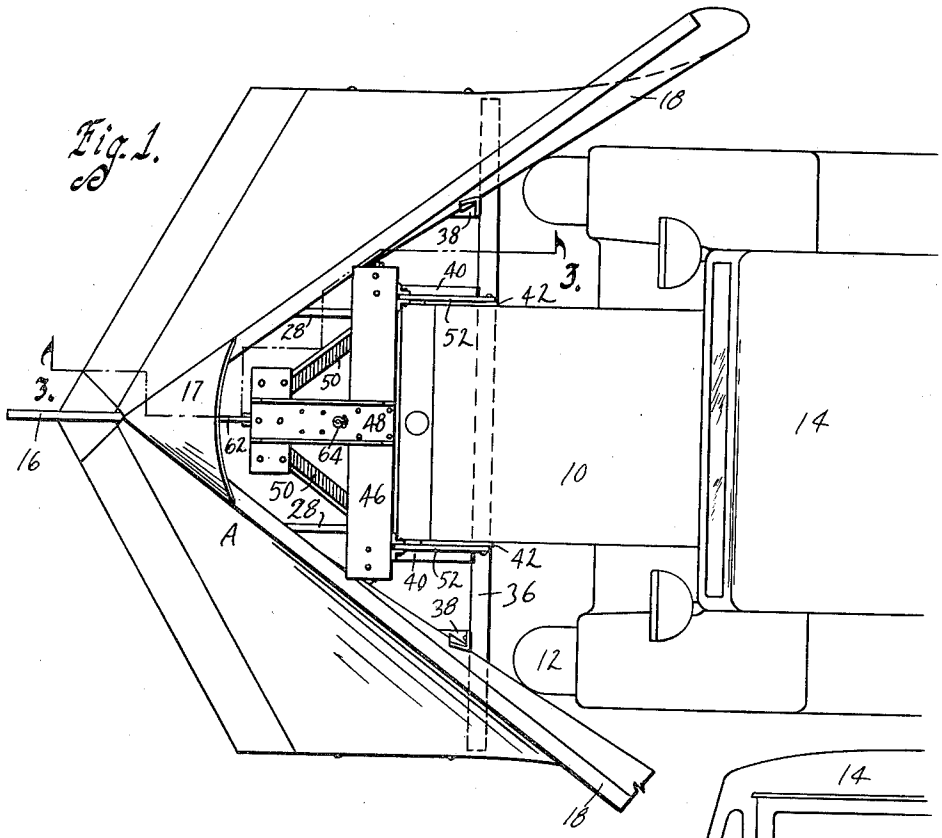
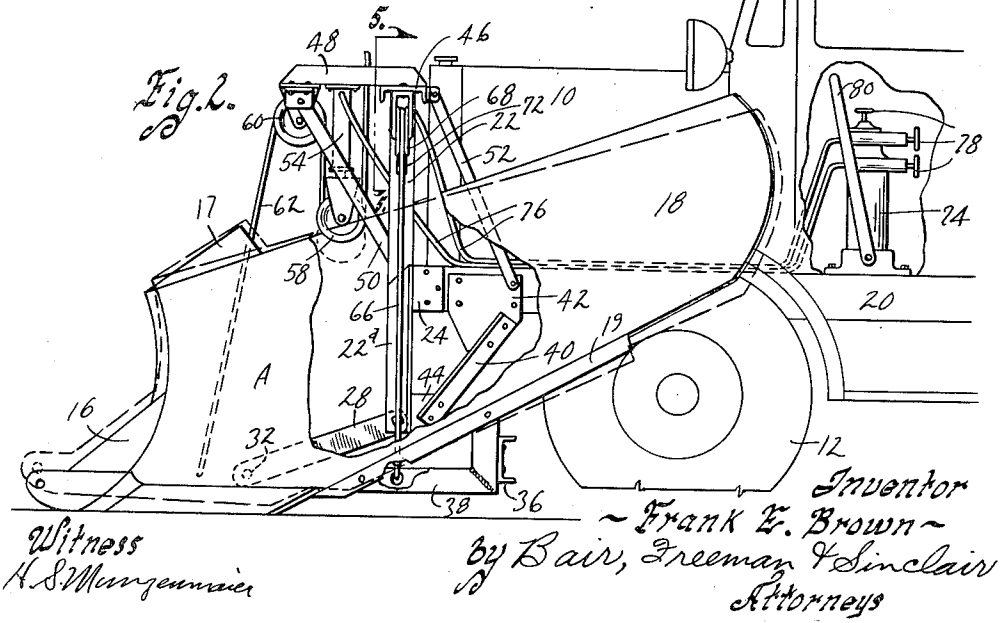



Fig. 2.




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Fig. 3.

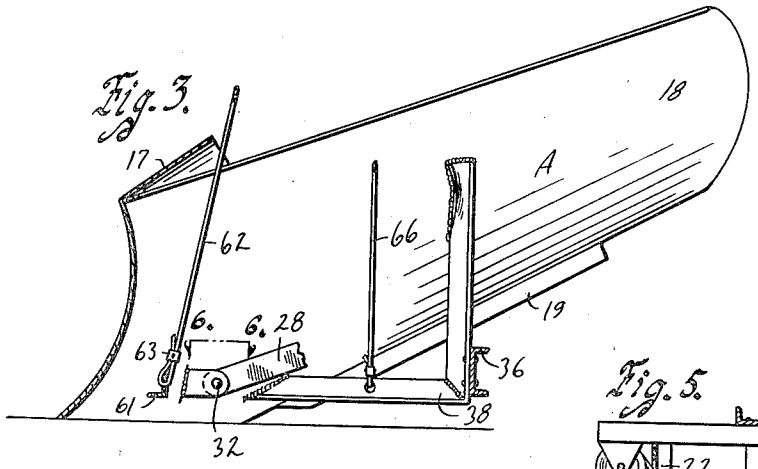



Fig. 5.

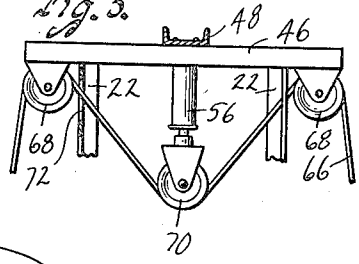



Fig. 6.

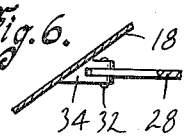
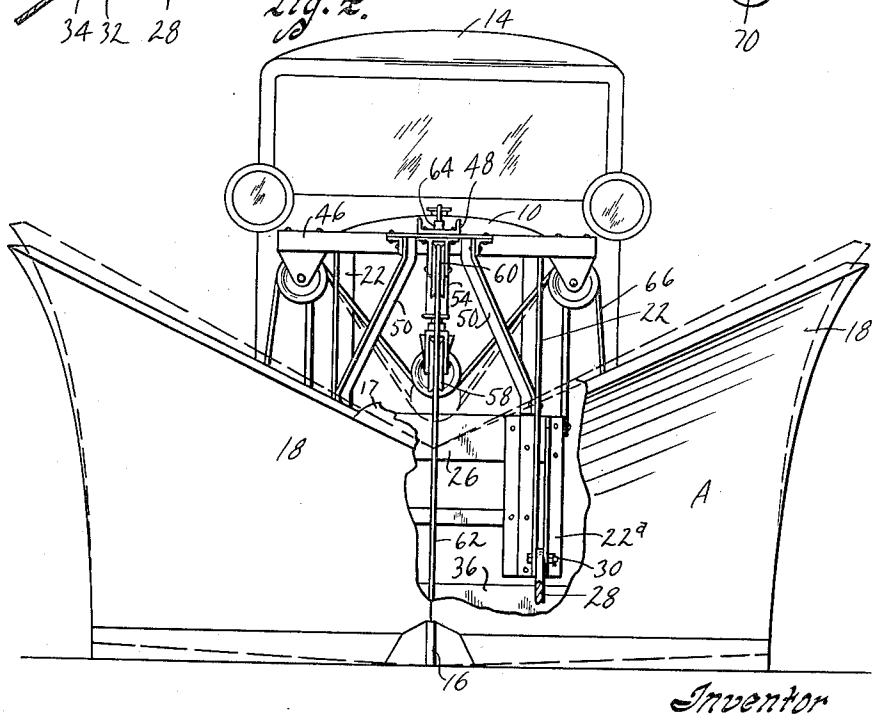



Fig. 4.




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# UNITED STATES PATENT OFFICE

2,070,153

## SNOW PLOW HOIST

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Application March 13, 1936, Serial No. 68,705

12 Claims. (Cl. 37—44)

The object of my invention is to provide a snow plow hoist of simple, durable and inexpensive construction.

A further object is to provide a snow plow hoist so designed and mounted on the front end of a vehicle that part of a V-shaped snow plow can overhang the front end of the vehicle, and thus permit a very close mounting of the snow plow relative to the vehicle to minimize the distance between the snow plow and the vehicle, thus reducing the weight of the apparatus necessary for supporting the snow plow relative to the vehicle.

Another object is to provide hydraulic jack means for vertically adjusting the snow plow relative to the vehicle, and including a cable connection with the front or point of the snow plow, and another cable connection with the rear thereof, these connections being either independently or simultaneously adjustable so that the snow plow can be tipped forwardly or rearwardly as desired, or raised vertically to an inoperative position.

Still another object is to provide a V-shaped snow plow with a cross frame and provided with a supporting frame for the snow plow, so arranged relative to each other that the cross frame can overhang the front of the vehicle without interfering with the operation of either the vehicle or the snow plow adjusting means.

A further object is to provide a cable connection at the rear of the snow plow which supports the wings so that they can swing laterally to conform to the contour of the road from which the snow is being plowed.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a snow plow hoist embodying my invention, showing it attached to a vehicle.

Figure 2 is a side elevation of the same, part of the snow plow blade being broken away to show details of the construction of the hoist.

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Figure 4 is a front elevation of the snow plow hoist on the vehicle, part of the snow plow blade being broken away.

Figure 5 is a sectional view on the line 5—5 of Figure 2, showing details of one of the hydraulic jacks for adjusting one of the cables; and

Figure 6 is a sectional view on the line 6—6 of Figure 3.

On the accompanying drawings I have used the reference numeral 10 to indicate the hood of a truck, the front wheels of which are indicated at 12, and the cab thereof at 14.

A snow plow is illustrated at A, this plow being of the V-type having a point at 16 and wings at 18. The forward end of the plow A has a shield 17. I provide a hoist for the snow plow A including a main frame attached to the frame 20 of the truck. This main frame includes a pair of vertical frame elements 22 secured to the frame 20 of the truck as by plates 24 which are connected with a cross bar 26. Also connected with the cross bar are vertical frame elements 22*a*, and between the elements 22 and 22*a* thrust bars 28 have their rear ends pivoted on a pivot bolt 30. The front ends of the thrust bars 28 are pivoted as at 32 to brackets 34 welded or otherwise secured to the snow plow A.

A cross bar 36 connects a pair of L-shaped brackets 38 together, the ends of these brackets being welded to the snow plow A as shown in Figure 3. The cross bar 36 it will be noted underhangs the front end of the frame 20, thus permitting close positioning of the snow plow A relative to the vehicle.

The lower ends of the frame elements 22 and 22*a* are reinforced to properly take the thrust of the snow plow against the thrust bars 28 by truss bars 40 extending at an angle from plates 42 mounted on the frame 20 to plates 44 connecting the frame elements 22 to the forward ends of the truss bars 40.

At the upper end of the frame elements 22 there is a head bar 46, a forwardly extending frame bar 48 and suitable braces 50 and 52 to provide a supporting frame having a pair of hydraulic jacks 54 and 56.

The jack 54 carries a pulley 58, while the front end of the frame bar 48 carries a pulley 60. A cable 62 is secured to a cross bar 61 of the plow A adjacent the point thereof by a clamp 63, as shown in Figure 3, and extends over and under the pulleys 60 and 58 respectively, the other end thereof being secured by a clamp 64 (see Figure 1) to the frame bar 48.

A second cable 66 has its ends connected to the frame members 38 of the snow plow A, and its intermediate portion extending over a pair of pulleys 68 and under a pulley 70. The pulleys 68 are supported by the cross frame 46, while the pulley 70 is supported by the second hydraulic jack 56. The second cable 66 is freely shiftable

relative to the pulleys 68 and 70 to permit lateral tipping of the snow plow. The frame elements 22 are provided with slots 72 for the cable 66 to extend through (see Figure 5).

For operating the hydraulic jacks 54 and 56, I provide an oil pump 74, suitable conduits 76 and control valves 78, the pump being either motor driven or hand operated, and a lever for hand operation being shown at 80. Pumps of this character are available on the market and accordingly there is no need to go into details as to their construction in the present application, it being understood that the pump and valves can be operated so that either both jacks are extended simultaneously or either one extended individually as desired, by proper manipulation of the pump and valves.

By individual connections with the front and rear of the snow plow, and the provision of means for adjusting either connection individually, the front end of the plow can be raised as shown by dotted lines in Figure 2, or the rear end thereof can be raised as shown by dotted lines in Figure 4, without raising the other end of the plow. This makes it possible to easily and readily adjust the plow while it is in operation.

By operating both jacks simultaneously, the plow can be raised instead of tipped forwardly or rearwardly. This provides a very convenient and desirable means of adjustment for the plow, if it is necessary to quickly adjust the plow during operation as various conditions are encountered, in order to facilitate maximum efficiency and permit maximum speed of operation of the snow plow.

Handling of the snow plow is further facilitated by the underslung or underhung arrangement of the cross bar 36 relative to the vehicle. This cross bar is necessary to properly reinforce the wings 18, and if mounted ahead of the supporting frame work for the plow, it would necessarily place the snow plow much further ahead.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a snow plow hoist, a frame for attachment to the front of a vehicle, a snow plow, means of connection between said snow plow and said frame for pushing said snow plow and permitting vertical movement thereof relative to said frame and means for supporting said snow plow relative to said frame comprising an adjustable cable connection with the front thereof and an adjustable cable connection with the rear thereof, said cable connections being independently adjustable for raising either the front or the rear of said snow plow or for simultaneously raising both the front and the rear thereof and said adjustable cable connection with the rear thereof being shiftable to permit lateral tipping of said plow.

2. In a snow plow hoist, a frame for attachment to the front of a vehicle, a snow plow, means of connection between said snow plow and said frame for pushing said snow plow and permitting vertical movement thereof relative to said frame and means for supporting said snow plow relative to said frame comprising a cable connection with the front thereof, a cable connection with the rear thereof which is shiftable to permit lateral tipping of said snow plow, a hydraulic jack for each cable, said cables being independently or simultaneously adjustable by manipulation of said jacks.

3. In a snow plow hoist, a frame for attachment to the front of a vehicle, a snow plow, means of connection between said snow plow and said frame for pushing said snow plow and permitting vertical movement thereof relative to said frame and means for supporting said snow plow relative to said frame comprising a pair of hydraulic jacks mounted on said frame, a cable connected with said snow plow at the front thereof, a second cable having its ends connected with the rear thereof, said cables being operatively connected with said jacks for take-up upon operation of the jacks, the jack for said second cable having a pulley, the intermediate portion of said second cable extending around said pulley and thereby shiftable relative to said jack and means for operating said jacks.

4. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a cable connected with the point of said V-shaped plow, means for adjusting said cable, a second cable having its ends connected with each wing of said V-shaped plow and a second means for adjusting said second cable independently of or simultaneously with the means for adjusting the first cable, said second cable having its intermediate portion shiftable relative to said second means.

5. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a cable connected with the point of said V-shaped plow, a hydraulic jack for adjusting said cable, a second cable connected with each wing of said V-shaped plow and a second hydraulic jack for adjusting said second cable independently of or simultaneously with the first hydraulic jack, said second cable being shiftable relative to said second hydraulic jack to permit lateral tipping of the plow.

6. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a connection with the point of said V-shaped plow, means for adjusting said connection, a second connection with each wing of said V-shaped plow and a second means for adjusting said second connection independently of or simultaneously with the means for adjusting the first connection, said second connection being freely shiftable to let one of said wings drop and the other rise.

7. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a cross frame connected with the wings of said V-shaped plow, said cross frame underhanging the end of said vehicle to which said first frame is attached, a cable connected with the point of said V-shaped plow, means for adjusting said cable, a second cable connected with said cross frame adjacent each wing of the plow and a second means for adjust-

ing said second cable independently of or simultaneously with the means for adjusting the first cable, said second cable being freely shiftable to let one of said wings drop and the other rise.

8. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a pair of downwardly extending jacks mounted at the top of said frame, a pulley carried by each jack, a first pulley on said frame for one of said jacks, second and third pulleys on said frame for the other of said jacks, a cable connected with said frame, extending under the pulley of the first jack and over said first pulley and then down to the point of the V-shaped plow, a second cable extending from one wing of said V-shaped plow, over said second pulley, under the pulley of the other jack, over the third pulley and then to the other wing of said V-shaped plow and means for adjusting said jacks.

9. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a pair of downwardly extending hydraulic jacks mounted at the top of said frame, a pulley carried by each jack, a first pulley on said frame for one of said jacks, second and third pulleys on said frame for the other of said jacks, a cable connected with said frame, extending under the pulley of the first jack and over said first pulley and then down to the point of the V-shaped plow, a second cable extending from one wing of said V-shaped plow, over said second pulley, under the pulley of the other jack, over the third pulley and then to the other wing of said V-shaped plow and oil flow control means for adjusting said jacks either individually or simultaneously.

10. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a pair of downwardly extending jacks mounted at the top of said frame, a pulley carried by each jack, a first pulley on said frame for one of said jacks, second and third pulleys on said frame for the other of said jacks, a cable connected with said frame, extending under the pulley of the first jack and over said first pulley and then down to the point of the V-shaped plow, a second cable extending from one wing of said V-shaped plow, over said second pulley, under the pulley of the other jack, over the third pulley and then to the other wing of said V-shaped plow, means for adjusting said jacks, and a cross bar from one of said wings to the other one and extending under the end of said vehicle to which said frame is attached.

11. In a snow plow hoist, a frame attached to a vehicle, a V-shaped plow, thrust bar means of connection between said plow and said frame permitting vertical movement of the plow relative to the frame and means for supporting said plow on said frame comprising a pair of downwardly extending hydraulic jacks mounted at the top of said frame, a pulley carried by each jack, a first pulley on said frame for one of said jacks, second and third pulleys on said frame for the other of said jacks, a cable connected with said frame, extending under the pulley of the first jack and over said first pulley and then down to the point of the V-shaped plow, a second cable extending from one wing of said V-shaped plow, over said second pulley, under the pulley of the other jack, over the third pulley and then to the other wing of said V-shaped plow, oil flow control means for adjusting said jacks either individually or simultaneously, and a cross bar from one of said wings to the other one and extending under the end of said vehicle to which said frame is attached.

12. In a snow plow hoist, a frame attached to one end of a vehicle, a V-shaped plow, thrust bars connected with the lower end of said frame and with said V-shaped plow to permit vertical movement of the plow relative to the frame, a cross bar from one wing of said plow to the other one and located behind the lower end of said frame and behind said thrust bars and thus under the end of said vehicle to which said frame is attached and means for supporting said plow on said frame comprising a cable connected with the point of said V-shaped plow, means for adjusting said cable, a second cable connected with each wing of said V-shaped plow and a second means for adjusting said second cable independently of or simultaneously with the means for adjusting the first cable, said second cable being freely shiftable to let one of said wings drop and the other rise.

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