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1,867,186

SNOWPLOW

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2 Sheets-Sheet 1

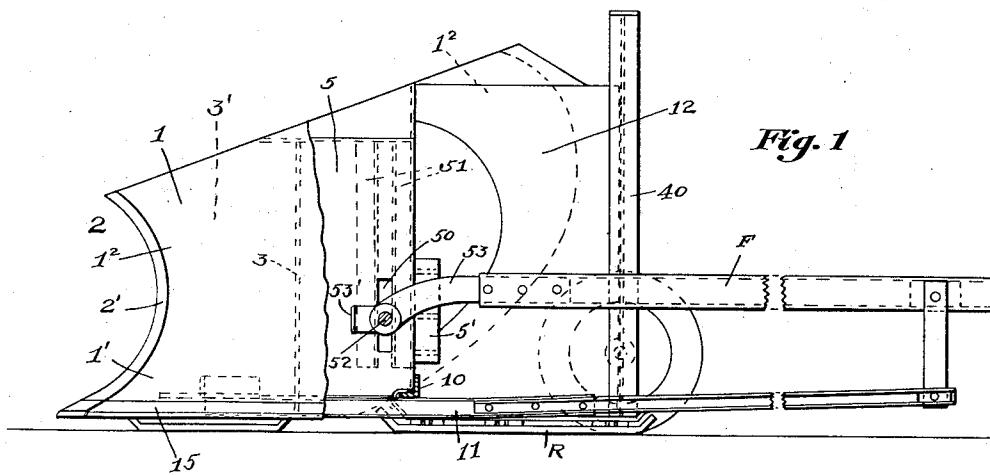


Fig. 1

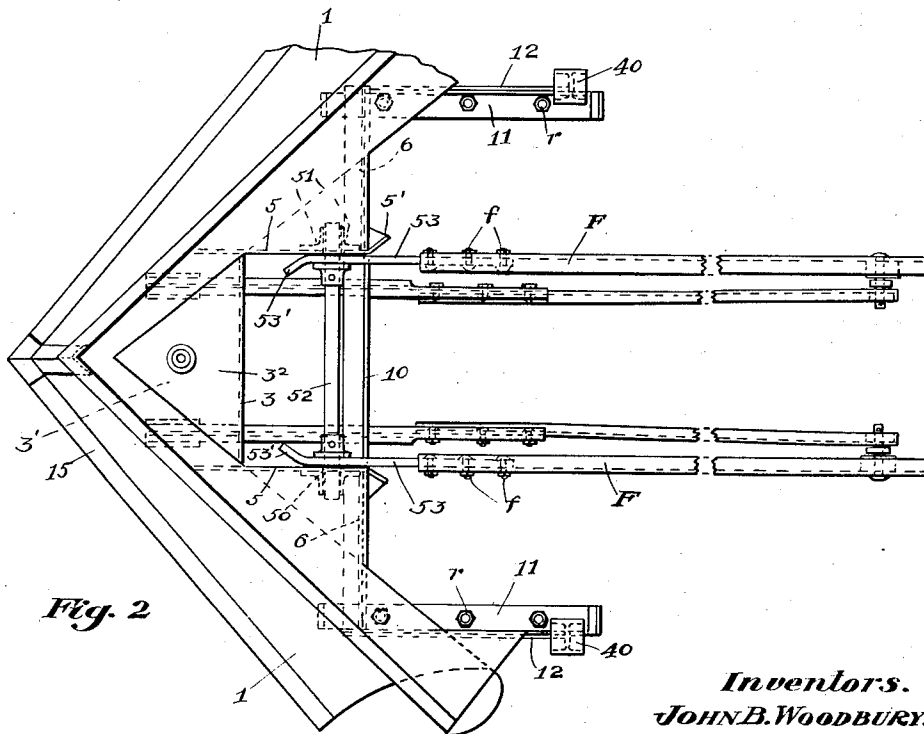


Fig. 2

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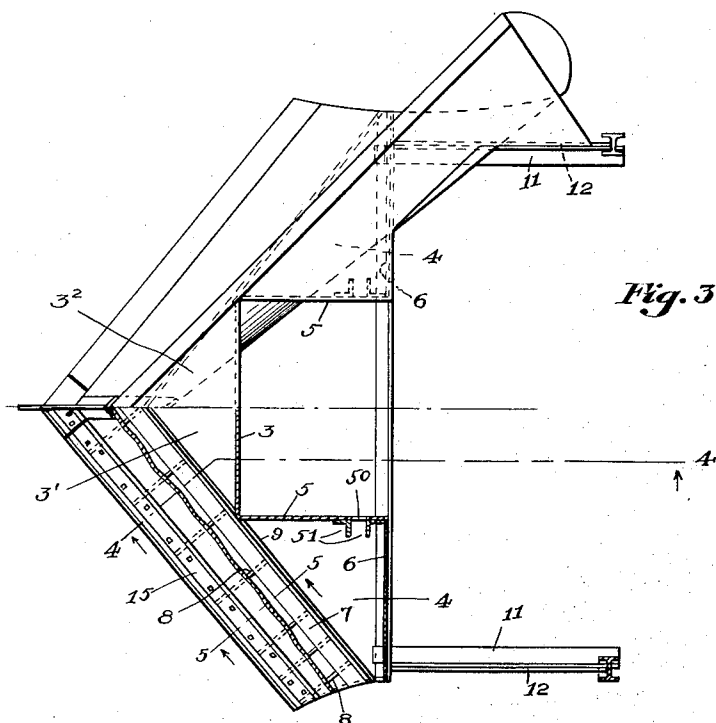
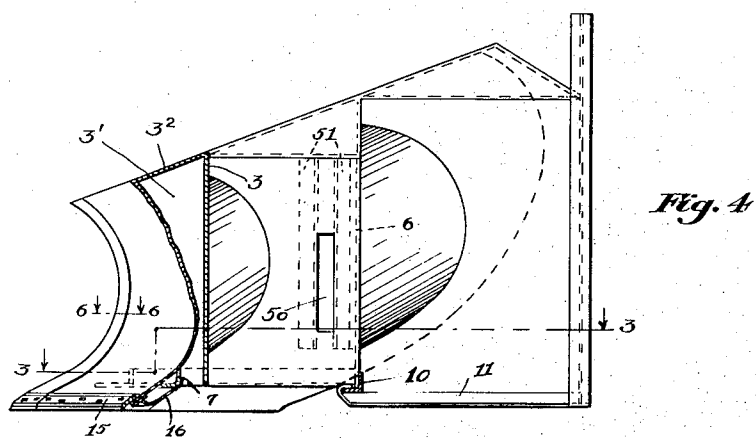
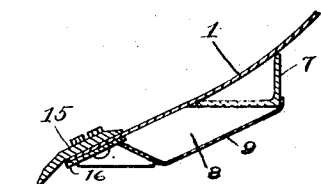
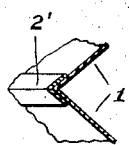
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UNITED STATES PATENT OFFICE

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SNOWPLOW

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The invention herein presented involves snow plow structures and particularly those of the plow nose. In plows of the curved mold board type where the snow is parted by the apex line of a wedge shaped structure, there are usually provided variant lateral contourings of the mold board to lift and move laterally the bodies of snow encountered and so parted.

The tasks imposed on such a plow are of infinite variety and demand. Not only are snow falls and deposits of different and varying depth, but in their physical constituency and characteristics the highway plow must meet and deal with deposits of all degrees of hardness and softness. While designs must be complex to give maximum efficiency on the average, structure must be such as to meet maximum conditions at any moment of emergency. Herein lay the dilemma of the road breaking nose or prow. Its weight has always been limited to the handling power available for operation and propulsion. It had to meet maximum stresses and strains in many times more directions than braces could be located. It had to stand constant rackings and leverages and at temperatures where the expansion and contraction of metal fastenings made tolerances utterly unreliable. Plows were built of complicated structure and braced in various directions according to the theory of their builders. The more braces the more of bolts, rivets, and other metal fastenings there were to work loose.

The concepts of the present invention are that of an integrated plow and one of cellular or web-walled type. That is to say, an integral structure of integrated members forming sub-units or regions of resistance of multiple direction stress and strain resistance.

A strut or brace represented only a line of resistance. It frequently constituted a leverage of destruction. An integrated unit

structure in accordance with the present invention gives three dimension support which in practice means support in practically every direction. Also, by reason of its integrality, stresses, strains and shocks are so distributed as to be absorbed in the whole. As illustrative of embodiments, in accordance with these concepts, the accompanying drawings illustrate a plow nose of general V type. In the drawings:

Fig. 1 is a side elevation partly broken away to expose interior parts and generally illustrative of characteristic plows to which the invention applies.

Fig. 2 is a plan view of the same.

Fig. 3 is a plan in half section on the line 3—3, of Fig. 4.

Fig. 4 is a similar section on the line 4—4, of Fig. 3.

Fig. 5 is a fragmentary section through the cutter bar region of the mold plate showing its integrated box construction, and

Fig. 6 is a section on the line 6—6, of Fig. 4.

Such a plow comprises a pair of lateral mold plates 1 which are shown of the variantly curved type having both the gentle lifting slope and the more sharply pitched steep portion to create suction and force the snow on its lateral component. Such mold plates cut and formed from heavy metal plates constitute in themselves very substantial members but obviously members of considerable extent and of such varied angularity or curvature as to constitute a considerable problem when embodied in a plow nose.

According to the present invention these mold members 1 are integrated at their forward edges to form a curved shear or stem 2. This is accomplished in a practical and convenient manner by welding the edges including such reinforcing material 2¹ as may afford a basis not only of integration but also of reinforcement.

Somewhat to the rear of this vertical shear

2 is located a transverse bulkhead or gusset 3 laterally fitted to the curvature of the mold plates and integrated along its line of juncture as before described. This provides a somewhat wedge-shaped compartment or cell 3¹ defined on its sides by the apex walls of the mold members 1 and laterally rearwardly by the gusset or bulkhead 3. This is further developed in its cell-like structure by a plate 3² fitted at the top of the cell and further bracing its other members through integration therewith along each line of contact.

Such constitutes the apex or forward wedge region of the plow nose, but there must further be considered the lateral strengthening of the rear portion of the mold plates 2 and the provision of regions of strength for the propulsion of the nose and its attachment to the truck or tractor as well as to its adjustment and support thereon.

The invention therefore contemplates a further development of such a nose by forming lateral cells 4. These are formed by longitudinal plates 5 which are fitted to the transverse bulkhead plate 3 and included in its line of integration with the mold plates 1. To the edges of each of these plates 5 is welded the edge of a transverse gusset or plate 6 which at their outer edges are fitted and welded to the curved mold plates 1.

The lower edges of the mold plates 1 are provided with angular members 7 welded thereto and merging at the line of integration of the plates 1 constituting together and with the mold plate 1 a V-shaped line of great strength in the plow nose adjacent the lower edge which carries the cutter bars 15.

Each cutter bar is removably bolted through the bottom edge of the plate 1 to a reinforcing bar 16 and this in turn is backed up by spaced webs 8 integrated with the bar 7, the mold plate 1 and to a rear plate 9 which extends from the bar 7 to the brace bar 16 forming a cellular region just back of the cutter bar and extending the full length of the nose on each side.

The nose is cross-braced by an angle 10 which is supported at its ends by side beams 11 which back up the cutter bar region being integrated with the angle members 7 before described as included in the general unification of the cellular base of the mold plates. This provides a base of great strength for the plow nose and affords a means of transmitting to it the propulsive forces necessary to put the nose through the maximum demands of the heaviest drifts and compactions.

In order to provide for such propulsive engagement and to afford a basis of variant positions and adjustments of thrust, the plow is vertically slotted as at 50, the plate 5 being vertically reinforced with angle irons 51 disposed vertically and adjacent to the edges of the slot 50 and there welded so as to form

integral guideways for the bar 52 through the slots 50.

This bar 52 is carried by the brackets 53 attached to the truck frame F as by bolting as at f. The lower end of the plate 53 is inturned as at 53¹ and the member 5 has its rear vertical edge turned outwardly as at 5¹ thus affording a basis of easily positioning the truck relative to the plow nose in mounting up the nose on the truck in working position.

The members 11 which constitute parallel longitudinal beams one at each side and form part of the integrated bracing of the plow nose, also constitute backing for runners R adjustably bolted as at r. At the rear end of these lateral beams 11 is provided a vertical column 40 which constitutes a wing supporting column. This is integrated with the base beams 11 and to the rear of the mold board 1 by a longitudinal plate 12 which is fitted to the mold board 1 at the line of intersection of the rear plate 6 of the cell 4. This completes the nose which has all the various parts described, except as where otherwise specified, welded each to the other on all lines of contact. The whole nose is a unit and as such receives and absorbs all shocks and pressures in all the varied directions incident to both resistance and propulsion.

The members 11 constitute a main frame for the plow nose. They may be variously disposed and braced, and at their forward ends may converge in a V-shaped base frame carrying the mold plates which are integrated therewith.

At the lower edge the plates 9 and webs 8 make a cellular underbrace for backing up the cutter bar as described, and the gusset plates which form the bulk head construction give a bracing in all directions, as well as providing for internal connections.

By the use of fitted and edge welded plates we avoid the necessity of flanges and thus save weight without any sacrifice of strength. The plow nose thus becomes an integrated whole of maximum strength and minimum weight.

What we therefore claim and desire to secure by Letters Patent is:

1. In a snow plow, a nose frame comprising a pair of side sill beams, a cross beam connecting their forward end, a wedge shaped nose comprising a pair of concaved mold plates welded on a curved vertical nose line of the wedge, an inner transverse bulkhead plate having its sides fitted to the curved mold plates and welded thereto to the rear of the nose line, rearwardly disposed plates welded at the ends of the transverse bulkhead plate, and an outwardly disposed lateral plate extended from the rear edge of each and fitted and welded to the mold plates to the rear of the bulkhead weld and constituting a substantially triangular reinforcement

box at the rear ends of the nose bulkhead and in sustaining relation thereto, cover plates fitted to the box plates and mold plates and welded thereto, said rearwardly disposed plates of these lateral boxes being vertically

5 slotted to receive the ends of a transverse push bar.

2. In an integrated plow nose, a pair of converging mold plates, a pair of structural reinforcing members fastened to the mold plates adjacent their lower edges and having spaced unflanged webs extending outwardly therefrom, a pair of cutter bars fastened to the lower edges of said mold plates, and a pair of reinforcing bars underlying said cutter bars and underbraced by the webs of said structural reinforcing members.

3. In an integrated plow nose, a pair of converging mold plates welded to each other along a common meeting edge, a pair of structural reinforcing members fastened to said mold plates and having spaced unflanged webs extending outwardly therefrom, and bars underbraced by the webs of said structural members and welded thereto.

4. In an integrated plow nose, a pair of reinforcing members having spaced unflanged webs extending outwardly therefrom, and a pair of mold plates welded to the webs of said members.

5. In an integrated plow nose, a pair of side frame members, a pair of reinforcing members carried thereby and disposed as a V and having spaced unflanged webs extending outwardly therefrom, and a pair of mold plates welded to the webs of said members.

6. In an integrated plow nose, a pair of side frame members, a pair of reinforcing members carried thereby and disposed as a V and having spaced unflanged webs extending outwardly therefrom, a pair of converging mold plates welded to each other along a common meeting line, a pair of cutter bars fastened to the lower edges of said mold plates, and a pair of reinforcing bars underlying said cutter bars and underbraced by the webs of said structural reinforcing members.

7. In an integrated snow plow nose, a pair of reinforcing members having spaced webs extending outwardly therefrom, and a pair of mold plates fastened to the webs of said members.

8. In an integrated snow plow nose, a pair of reinforcing members, spaced unflanged webs welded thereto and extending outwardly therefrom, and a pair of mold plates fastened to the webs of said members.

9. In an integrated plow nose, a pair of converging mold plates, a pair of structural reinforcing members fastened to the mold plates adjacent their lower edges, and spaced unflanged webs welded to said reinforcing members and backing and bracing said mold plates.

10. In an integrated plow nose, a pair of

converging mold plates, a pair of structural reinforcing members fastened to the mold plates adjacent their lower edges, and spaced unflanged webs welded to said reinforcing members fastened to the mold plates, a pair of cutter bars fastened to the lower edges of said mold plates, and a pair of reinforcements underlying said cutter bars and underbraced by the webs of said structural reinforcing members.

In testimony whereof we affix our signatures.

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