Dec. 2, 1958 H. BLANCHET 2,862,315

FRAME FOR MOUNTING BLADES, SNOW PLOUGHS, OR THE LIKE, ON TRACTORS

Filed July 8, 1957 4 Sheets-Sheet 1

Fig. 1

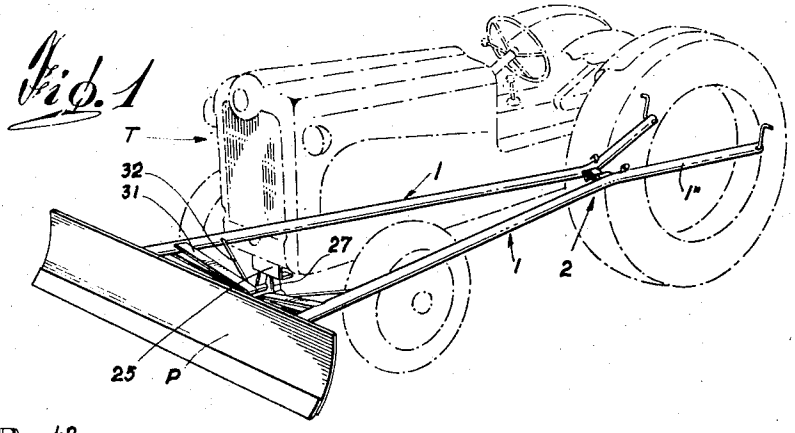


Fig. 2

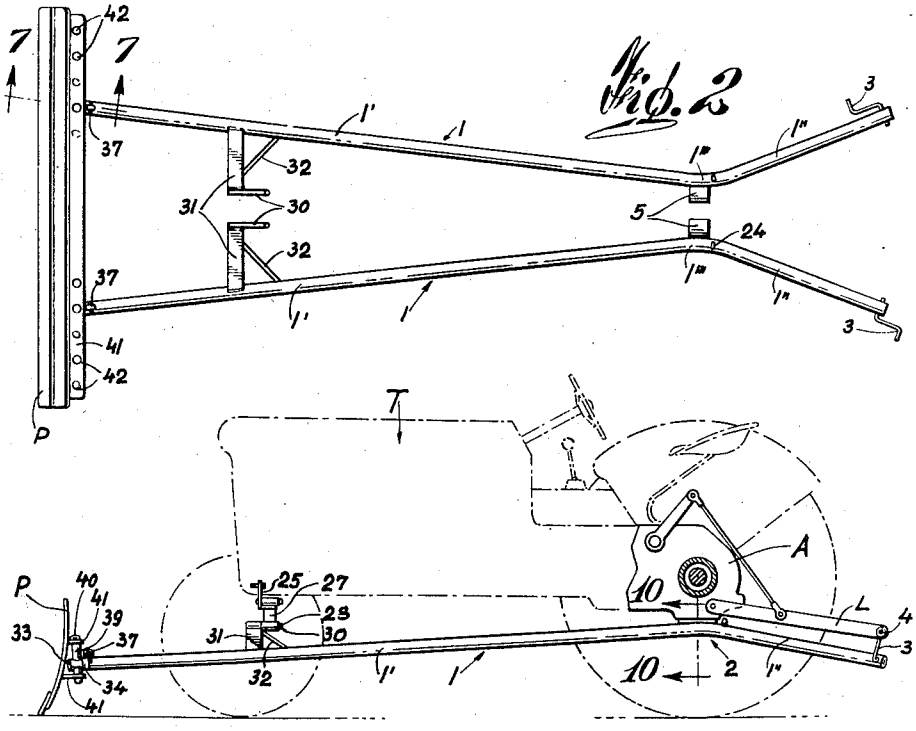


Fig. 3

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Fig. 4

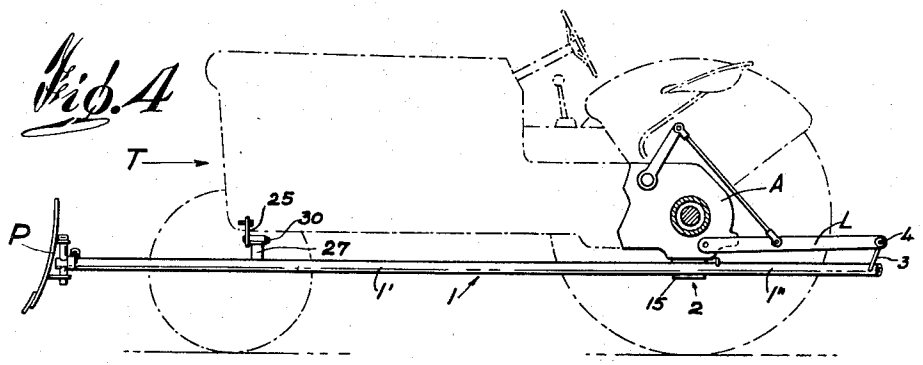


Fig. 5

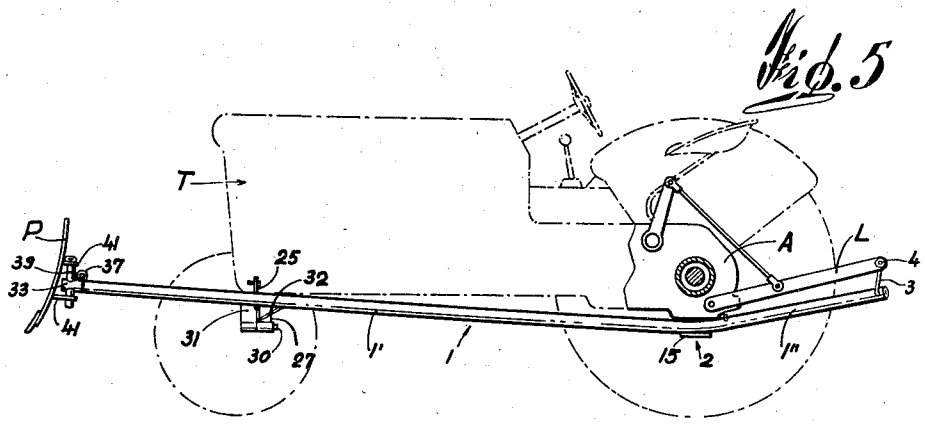
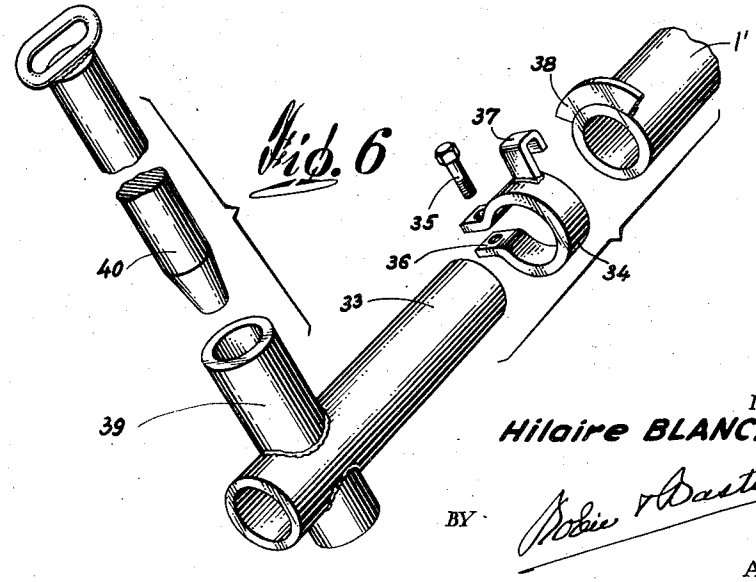


Fig. 6



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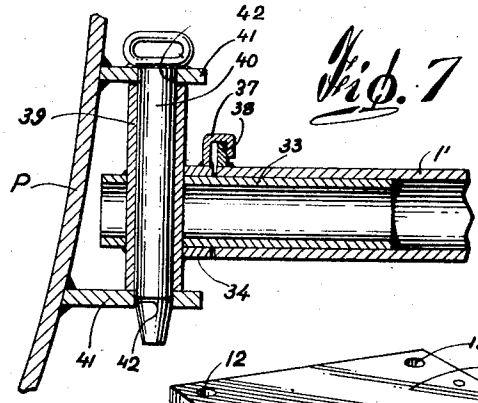


Fig. 7

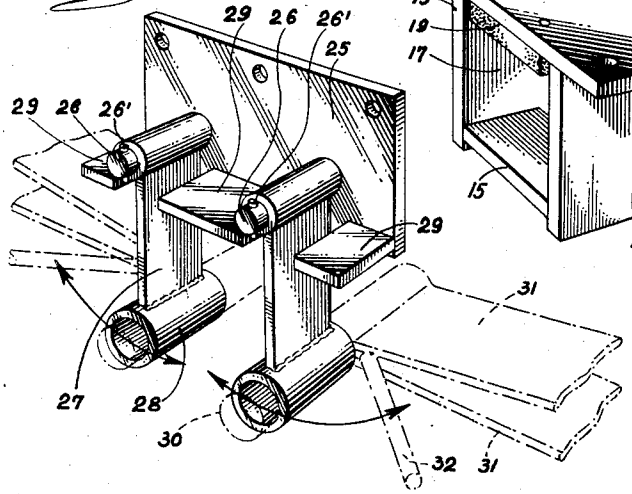


Fig. 8

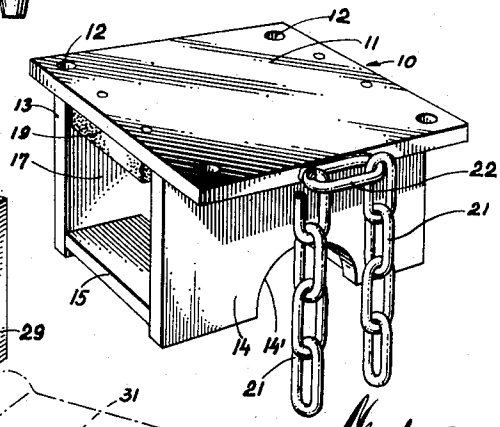


Fig. 9

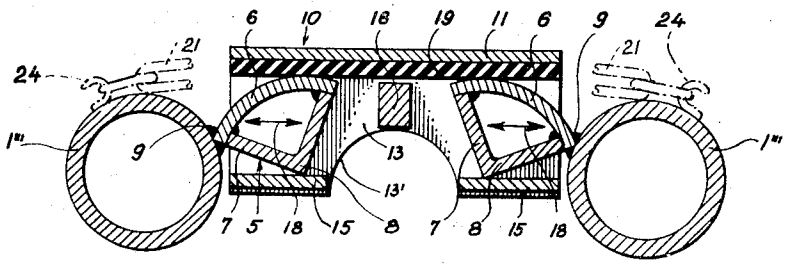


Fig. 10

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Fig. 11

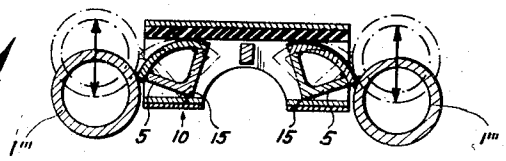


Fig. 12

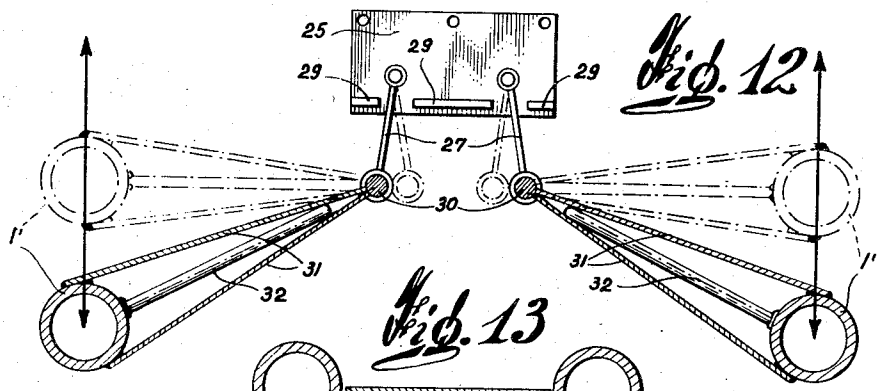


Fig. 13

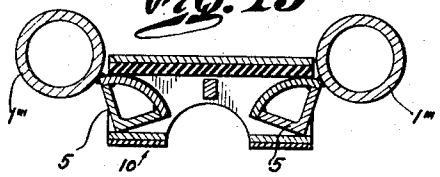


Fig. 14

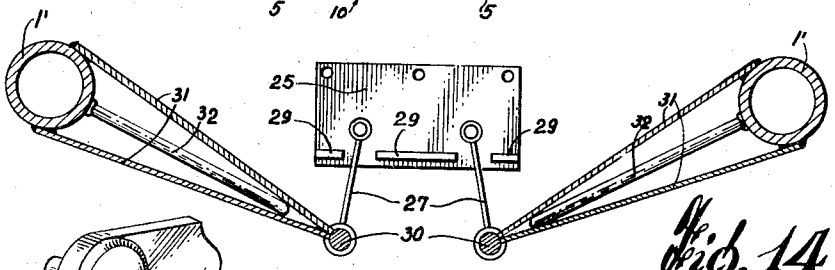
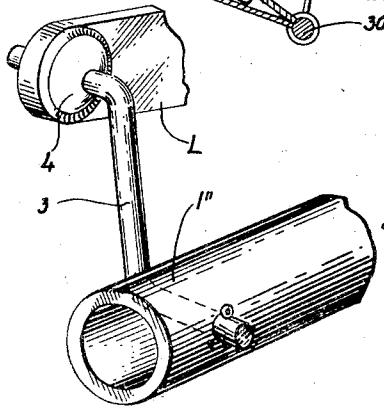


Fig. 15



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United States Patent Office 2,862,315
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2,862,315

FRAME FOR MOUNTING BLADES, SNOW PLOUGHS, OR THE LIKE, ON TRACTORS

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Application July 8, 1957, Serial No. 670,541

5 Claims. (Cl. 37—144)

The present invention relates to an attachment for mounting a load moving device, such as a snow or earth engaging blade, a rotary snow plough or the like implement, in front of a motor vehicle and, more particularly, a tractor equipped with a lifting mechanism which provides means for vertically raising and lowering said device relative to the tractor.

The general object of the present invention is the provision of a mounting frame of the character described which is of simple and inexpensive construction and which is designed to be quickly and readily affixed to or removed from the tractor in a convenient manner.

Yet another important object of the present invention is the provision of a mounting frame of the character described which can be readily connected to the conventional lifting mechanism at the back of a tractor.

Another important object of the present invention is the provision of a mounting frame of the character described which is so designed that, when it is removed, the tractor and its lifting mechanism are available for other tasks, the lifting mechanism being free of any permanent attachment associated with the mounting frame.

Yet another important object of the present invention is the provision of a mounting frame of the character described consisting essentially of two, tubular members which are so designed that they will transmit to the implement at the front of the tractor a lifting or lowering movement controlled by the lifting mechanism of the tractor and which will resist lateral forces exerted on the implement, as well as, rearwardly directed forces, and which is also designed to be resilient so as to readily obey when the implement passes over obstruction.

The foregoing and other important objects of the present invention will become more apparent during the following disclosure and by referring to the drawings in which:

Figure 1 is a perspective view of the mounting frame by means of which a snow or earth engaging blade is mounted in front of a conventional tractor;

Figure 2 is a top plan view of the mounting frame and blade;

Figure 3 is a side elevation of the same elements in association with the lifting mechanism of the tractor, in the lowered position of the blade;

Figure 4 is a similar view showing the blade in an intermediate raised position;

Figure 5 is a similar view showing the blade in fully raised positions;

Figure 6 is an exploded perspective view of the means for connecting the blade or other implement to the front ends of the tubular mounting frame;

Figure 7 is a longitudinal section along line 7—7 of Figure 2 of the assembled elements of Figure 6, together with the blade;

Figure 8 is a perspective view of the means for connecting the front portions of the frame tubes to the tractor;

Figure 9 is a perspective view of the means for connecting the fulcrum portions of the frame tubes to the tractor;

Figure 10 is a cross-section along line 10—10 of Figure 3 and showing the tubular members in the position corresponding to Figure 3;

Figure 11 is a cross-section similar to that of Figure 10 and showing the tubular members in the positions of Figures 3 and 4;

Figure 12 is a cross-section of the means shown in Figure 8, and showing the positions of the tubular members corresponding to the positions of Figure 11;

Figure 13 is a cross-section similar to that of Figure 11 showing the tubular members in raised position corresponding to the position of the frame shown in Figure 5;

Figure 14 is a cross-section similar to that of Figure 12 showing the front portion of the tubular elements in the position corresponding to that of Figure 13; and

Figure 15 is a partial perspective view of the connection between the rear end of a tubular element and the conventional lifting lever of a tractor equipped with a lifting mechanism.

Referring now more particularly to the drawings in which like reference characters indicate like elements throughout, the mounting frame, according to the present invention, is constituted by two independent tubular members 1 each bent into a V-shape to form two angularly directed legs 1′ and 1″ of unequal lengths. The two V-shaped tubular members 1 are oppositely disposed with their apices pivotally mounted at 2, underneath the differential housing A of the tractor T, for pivotal movement about horizontal axes substantially parallel to the longitudinal axis of the tractor T. Thus, raising or lowering the outer ends of the rear legs 1″ will effect up and down movements of the outer ends of the front legs 1′ to thereby raise or lower the plough or blade P or any other implements which may be secured to the outer ends of said front legs 1′. The elevation of the blade P is controlled by the usual lifting mechanism of the tractor which comprises lift arms L pivotally connected to the outer ends of the rear legs 1″ of the tubular member 1.

The conventional lift arms L are normally pivoted to the differential housing A and flare laterally, outwardly towards their rear, outer ends. Similarly, the rear legs 1″ of the tubular members 1 flare outwardly at an angle towards their rear, outer ends so as to extend underneath the lift arms L in substantially the same vertical planes.

The outer ends of the rear legs 1″ are flexibly connected to the outer ends of the lift arms L by means of crank-shaped connecting rods 3 which are pivotally mounted on the legs 1″ and have their other end removably inserted within a metal ball member 4 of the ball and socket joint of the lift arm L (see Figure 15).

Each tubular member 1 is provided adjacent its apex 1‴ with an inwardly, laterally projecting pivotal member 5 providing a knife edge. Referring to Figure 10, this pivotal member 5 is made of a segment of a short tube as indicated at 6, welded to a short length of angle iron 7 providing the knife edge 8. This pivotal member 5 is welded or otherwise secured to the side of the tubular member 1, as shown at 9.

A box-like housing 10 is bolted, or otherwise secured, underneath the differential housing A of the tractor T. The housing 10 is shown in Figure 9 and comprises a top plate 11 provided with holes 12 for bolting to the differential housing and to which are welded or otherwise secured front and back plates 13 and 14, which are downwardly directed and which are spaced from each other a distance slightly greater than the length of the pivotal members 5. Horizontal fulcrum plates 15 are secured to the lower portions of the plates. A spacer member 16 interconnects the front and back plates 13 and 14 and re-

inforces the housing. The plates 13 and 14 are provided with semicircular recesses 13' and 14' for the passage of a transmission shaft connected to the rear power take-off of the tractor and used for driving a rotary snow plough mounted at the front of the tractor. The housing 10 forms two, laterally opening cavities 17 for removably receiving the pivotal members 5 of the tubular members 1. The knife edges 8 of said pivotal members 5 are adapted to bear on the fulcrum plates 15 such that said pivotal members can rock on the plates 15 and also such that said pivotal members can be laterally displaced transversely of the housing 10, as indicated by the arrows 18 in Figures 10. A resilient pad 19, made of rubber or the like, lines the underface of the top plate 11 and resiliently engages the segments 6 of the pivotal members 5 so as to prevent rattling of the latter within the housing 10. The housing 10 is further provided with a chain 21 having its middle link 22 secured to the rear edge of the top plate 11 and providing two, free chain lengths adapted to be removably attached to hooks 24, secured to the tubular members, in order to prevent lateral displacement of said members and the pivotal members 5 from within the housing 10, while allowing free pivotal movement of said pivotal members 5 within said housing 10. The distance separating the front plates 13 and 14 is only slightly greater than the length of the pivotal members 5 so that said plates form positive abutment members for preventing axial displacement of the tubular members 1 relative to the tractor.

The front legs 1' of the tubular members 1 are stabilized in their up and down movement and are prevented from excessive lateral movement by the front mounting means more particularly shown in Figures 2 and 8. A vertical plate 25 is rigidly secured by bolts or the like to the front part of the chassis of the tractor T underneath said tractor and transversely of the same. Two parallel spaced stud shafts 26 are rigidly secured to the plate 25 and are adapted to extend rearwardly with respect to the tractor. Freely swingable arms 27 are mounted on the stud shafts 26 and are retained thereon by retaining pins 26'. The arms 27 are provided with sleeves 28 at their lower ends and the lateral, swinging movement of said arms 27 is limited by abutment flanges 29 secured to the plate 25. The sleeves 28 are adapted to removably receive rearwardly directed pins 30 which are disposed laterally, inwardly of the tubular members 1 and are secured thereto by means of rigid, lateral arms 31 and a brace 32.

The blade P (or any other load moving device) is removably connected to the forward end of the tubular members 1 such that the angular position of the blade P with respect to the tractor can be varied. The connection means are more particularly illustrated in Figures 6 and 7. A tube 33 is telescopically engaged within the forward end of the tubular member 1 and a split collar 34 is adapted to be secured anywhere along the length of the tube 33 by means of the bolt 35 engaging ears 36. The collar 34 is provided with a hook member 37 adapted to engage a segmental flange 38 on the end of the tubular member 1. The tube 33 is provided with a cross tube 39 open at both ends to receive a king pin 40. The blade P or other load moving device, has rearwardly directed, spaced flanges 41 adapted to contact the top and lower ends of the cross tube 39. The flanges 41 have spaced holes 42 adapted to register with the bore of cross tube 39 for the insertion of the king pin 40. The hook 37 on the collar 34 which engages the segmental flange 38 prevents disengagement of the tube 33 from within the tubular member 1, while allowing relative torsional movement between said two members.

Whenever it is desired to remove the blade P, only the king pins 40 are withdrawn. If it is desired to vary the angular position of the blade P, the bolt 35 on the selected side of the tractor is unscrewed and the associated collar is adjusted on the tube 33 to another longitudinal position. If the angular position of the blade is varied to a great extent it will be necessary to insert the king pin 40 in another hole 42 of the flanges 41.

It will be noted that, in practice, only the housing 10, shown in Figure 9, and the front mounting assembly, shown in Figure 8, and consisting of plate 25 and freely swinging arms 27 are permanently secured to the tractor. The assembly shown in Figure 2 can be quickly assembled and disassembled because there are no bolts or the like to be screwed or unscrewed. The assembly shown in Figure 2 and comprising the blade P and tubular members 1 may be quickly mounted on the tractor by simply inserting the pins 30 within the sleeve 28 of the front mounting assembly, inserting the pivotal members 5 laterally and inwardly within the side cavities 17 of the housing 10 secured underneath the tractor differential housing A, inserting the free ends of the crank-shaped connecting rods 3 within the steel balls 4 of the conventional lift arms L and finally attaching the chain lengths 21 to the hooks 24.

The chains 21 prevent lateral disengagement of the tubular members from within the housing 10, while said housing prevents axial displacement of the tubular members and, therefore, prevents accidental disengagement of the pins 30 from within the sleeves 28.

Raising of the lift arms L under the control of the tractor will cause raising of the rear legs 1'' and, due to the inclination of said legs 1'', rocking movement of the pivotal members 5 within the housing 10, as shown in Figure 11, and consequent simultaneous raising movement of the outer ends of the front legs 1'. Lowering of the arms L will similarly cause lowering of the front legs 1'. The raising and lowering movement of the outer ends of the legs 1' would normally result in said outer ends describing arcs of circles; but, because said outer ends are connected to the blade P, they describe vertical movement in straight paths. This is made possible by the free, swinging movement of the arms 27 to which the front portions of the tubular members 1 are connected, as clearly shown in Figure 12.

Similarly, the slight, circular path, which would normally be described by the rear ends of the rear legs 1'', is converted into a rectilinear path because the pivotal members 5 are free to displace themselves laterally, inwardly and outwardly on the fulcrum plates 15 of the housing 10, as clearly shown in Figures 11 and 13.

It will be understood that the tubular members 1 are subjected to torsional stresses resulting in a resilient mounting for the blade P or other load moving device. Thus shocks will be better resisted and also any obstacles tending to raise the plough will not result in breakage of the mounting frame. Any lateral displacement of the plough will also be resiliently resisted by the tubular members 1 and any excessive lateral displacement of the blade P will be positively prevented by the arms 27 abutting against the abutment flanges 29. Finally, the rearwardly directed forces exerted by the snow or ground engaging blade P will be directly resisted by the rear plate 14 of the housing 10, said plate abutting the pivotal members 5.

The mounting frame, according to the present invention, may be mounted on other types of wheeled vehicle than a tractor, and may be operated by manual or power means other than the conventional lifting mechanism at the back of a tractor.

Also the V-shape of the elongated members 1, although preferred, is not essential provided said members 1 have a shape to provide an intermediate pivoted portion and end portions laterally offset from said pivoted portion.

While a preferred embodiment according to the present invention has been illustrated and described it is understood that various modifications may be resorted to without departing from the spirit and scope of the appended claims.

I claim:

1. A frame for mounting a load device in front of a wheeled vehicle comprising a pair of independent, elongated members adapted to extend longitudinally of said wheeled vehicle in substantially close relationship, means pivotally supporting the intermediate portion of said members on said vehicle, the front and rear end portions of each of said elongated members being laterally offset with respect to the pivoted intermediate portion of said member, the front end portions of said independent, elongated members being adapted to be connected to and to support a load moving device, and the rear end portions of said independent elongated members being adapted to be connected to a lifting mechanism mounted on said wheeled vehicle, whereby operation of said lifting mechanism will cause vertical movement of said rear end portions of said elongated members and consequent rocking movement of said elongated members at their pivoted portions resulting in lowering or raising of said load moving device at the front end portions of said elongated members, said elongated members transmitting said movement to said device through torsional forces exerted on said elongated members, additional means supporting said independent elongated members on said vehicle at points intermediate their front ends and said pivoted portions, said last named means and said first mentioned means for pivotally supporting said independent members allowing transverse movement of the end portions of said independent members towards and away from each other during rocking movement of said elongated members; wherein said means for pivotally supporting said elongated members comprise a housing-like member secured underneath said wheeled vehicle and providing cavities opening laterally, outwardly, each of said cavities having top, bottom, front and back walls, knife edges secured to and laterally projecting from said elongated members and removably engageable with said cavities to bear on said bottom walls, said knife edges being free for lateral displacement within said cavities.

2. A mounting frame as claimed in claim 1, further including means removably linking said elongated members to said housing to prevent disengagement of knife edges from within said cavities.

3. A mounting frame as claimed in claim 1, including a resilient pad lining said top wall, the top part of each knife edge forming a segmental surface engageable with said pad.

4. A mounting frame as claimed in claim 1, further including connection means between the front end of each elongated member and said load moving device, said connection means comprising a short tubular member in telescopic engagement with the front end of said elongated member, a flange on said last named front end, a hook on said tubular member engageable with said flange to prevent disengagement of said short, tubular member from said elongated member while enabling relative rotation of said members, and means for removably connecting said device with said tubular member.

5. A mounting frame as claimed in claim 4, wherein said hook is secured to a collar, itself removably secured to and longitudinally adjustable on said short tubular member.

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