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BLADE MOUNTING FOR EARTH MOVING APPARATUS

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2 Sheets-Sheet 1

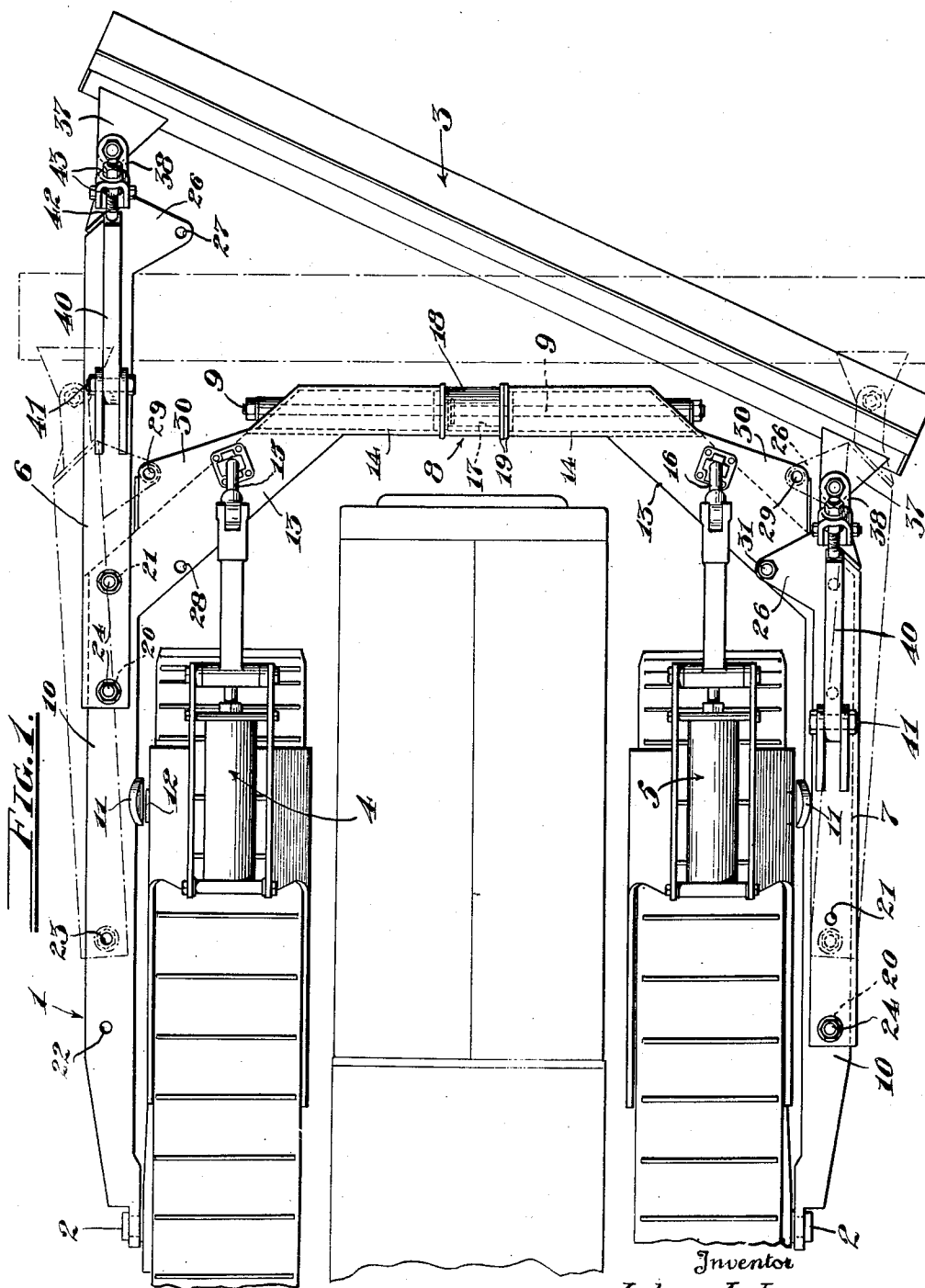


FIG. 1.

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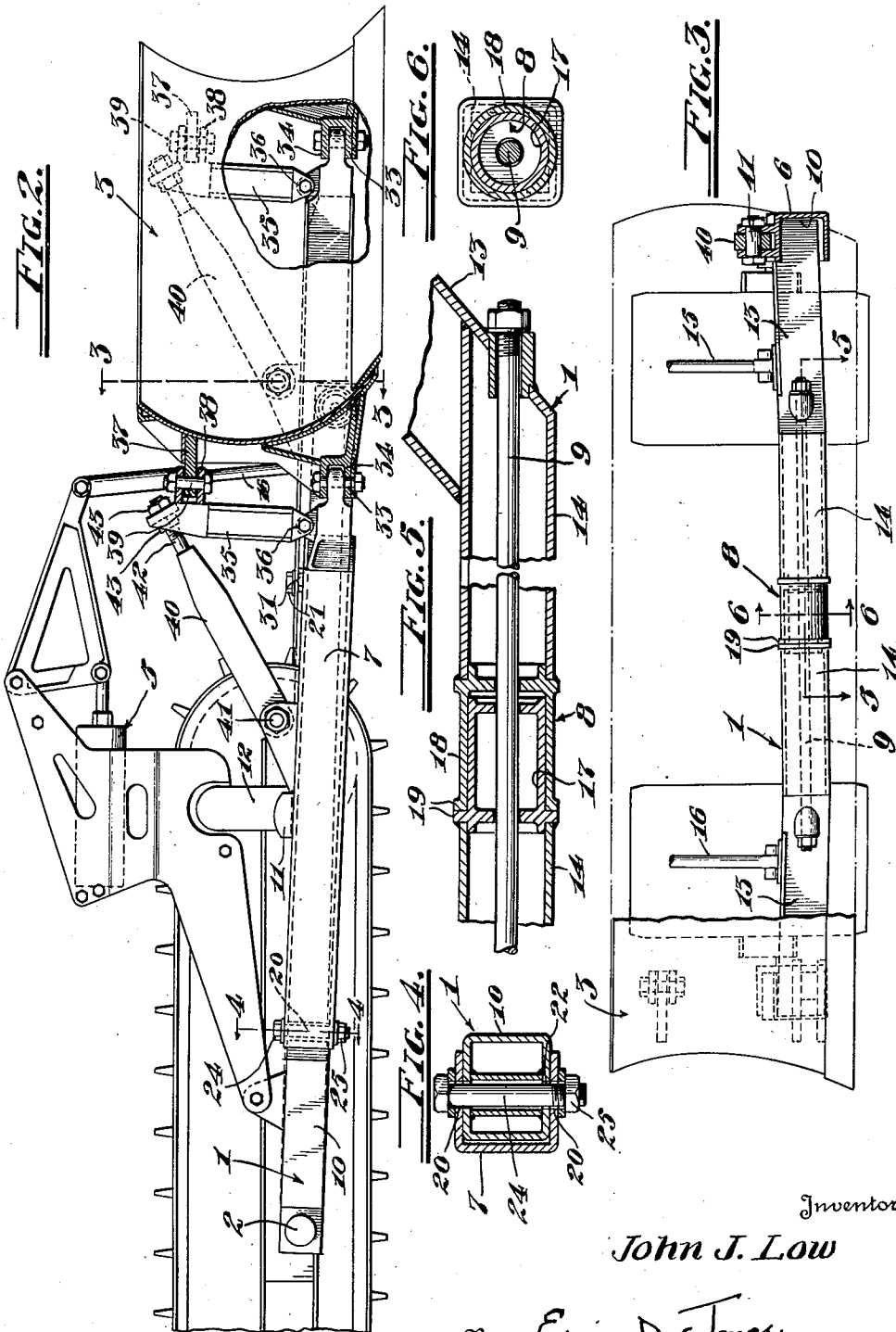
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2 Sheets-Sheet 2



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BLADE MOUNTING FOR EARTH MOVING
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Application February 1, 1939, Serial No. 254,022

6 Claims. (Cl. 37-144)

My invention relates to tractor operated earth moving or excavating apparatus of the pusher type and has for a purpose the provision of an improved blade supporting means which may be readily adjusted to set the blade to side-cast to either side or in a bulldozing position, or to the desired moldboard tilt and to eliminate objectional torsional stresses, while at the same time affording the desired ruggedness and strength and maintaining all adjustments and parts within smaller compass than heretofore in this art.

I am aware of earth moving apparatus wherein comparatively long blade supporting bars are swivelly and longitudinally slidably mounted on the sides of the tractor and must be extended rearwardly of the tractor to dispose the blade in certain operative positions. Such extension of said bars interferes with the movement of the apparatus in small or confined spaces. Moreover, mountings of this type lack the desired strength and rigidity and require the use of braces which are extended between the blade and said bars, and must be moved from one side of the tractor to the other when setting the blade for sidecasting, and must be removed when the blade is set in bulldozing position. Such mountings do not effectively prevent side movement of the blade nor positively hold the blade in a horizontal plane without setting up torsional stresses, nor confine the mounting to operation within spaces which are sufficiently close to the ends and sides of the tractor to avoid interfering with the desired operations of the apparatus in small spaces.

The apparatus of my invention is designed to overcome and eliminate the objections attendant upon blade mountings such as heretofore used and as hereinbefore described, through the use of a rigid main frame of yoke-like form which at its free ends is merely pivoted to the sides of the tractor and does not require longitudinal adjustment, nor at any time its extension rearwardly of the tractor or in any manner relative thereto such that it would interfere with tractor movement in small compass. Relatively short bars are longitudinally slidably supported on the sides of the frame and support the blade close to the front end of the tractor and for ready adjustment into side-casting and bulldozing positions without requiring the use of braces, it only being necessary to employ a pair of bolts to securely hold and effectively brace each bar on the rigid frame. A single joint located approximately centrally of the ends of the rigid frame is provided with means whereby it may be loosened to permit relative movement of the side portions of the frame where-

by the blade may be set in a horizontal plane without setting up torsional stresses. The joint is locked after the blade is set whereby the frame is made effectively rigid.

I will describe only one form of earth moving or excavating apparatus embodying my invention, and will then point out the novel features thereof in claims.

Referring to the drawings:

Figure 1 is a top plan view of the apparatus of the inventor as when mounted on a tractor.

Fig. 2 is a side elevation of the apparatus with parts broken away for clarity of illustration.

Fig. 3 is a sectional view taken on the plane of line 3-3 of Fig. 2.

Fig. 4 is a section taken on the plane of line 4-4 of Fig. 2.

Fig. 5 is a sectional view taken on line 5-5 of Fig. 3.

Fig. 6 is a sectional view taken on line 6-6 of Fig. 3.

As shown in detail in the accompanying drawings one embodiment of this invention essentially includes a substantially U-shaped or yoke-like frame 1 somewhat loosely pivoted as at 2 at its ends on and supporting in front of the tractor, the blade unit 3, said frame and blade unit being raised and lowered as is customary, by means of suitable hoist mechanisms 4 and 5.

In accordance with the invention the frame includes blade supporting bars 6 and 7 relatively slidable thereon to dispose the blade in side-casting or bulldozing positions as respectively shown in full and dotted lines in Fig. 1.

In order that the blade 3 may be maintained in a horizontal plane, the frame 1 is of articulate construction in that it is provided with a rotative joint 8 and is permitted a certain amount of play at its loosely pivoted ends. The two frame sections thus provided by reason of the rotative joint, support the slidable bars 6 and 7 which are fastened to the ends of the blade and, as the frame as a whole when in operative position, has a normal downward inclination, and said bars are relatively extended when desired to angularly dispose said blade, it is seen that one end of the blade will be higher than the other. In order to dispose the blade in a horizontal plane the frame must articulate, and this is provided for by the pivot joint and the lost motion at the loosely pivoted ends of the frame in such manner as to prevent the building up of objectionable torsional stresses. Following this compensating adjustment of the sections of the frame, a clamping bolt 9 at the pivoted joint 8, is set so as to lock said sections

against relative movement and provide a rigid blade support free from torsional stresses.

The frame sections are of box-like cross section and consist of straight side portions 10 paralleling the sides of the tractor and provided between their ends with wear shoes 11 adapted to slide upon shoes 12 fixed on the tractor. Joined to the outer ends of the straight portions are diagonally inwardly extended intermediate portions 13 which converge in front of the tractor and are formed integrally with end portions 14 extending at right angles to the straight side portions 10 and connected with one another by the pivoted joint 8. The hoists 4 and 5 are connected by rods 15 and 16 with the convergent portions 13 of the frame section as shown in Fig. 1.

As here provided the pivot joint 8 includes telescoping cylindrical portions 17 and 18 fixed as by being welded to the end portions 14 of the frame sections (see Figs. 5 and 6) and formed with abutting portions 19 which when the bolt 9 is tightened will bind the joint so as to prevent relative movement of the frame sections. When this bolt is loosened the two frame sections are subject to relative movement due to the rotative movement permitted of the telescoped cylindrical portions 17 and 18.

The slidable blade supporting bars 6 and 7 are in the form of channels and encompass the tops, outer sides and bottoms and are slidably supported on or in other words telescopically carried by the straight portions 10 of the frame sections as seen in Fig. 4. Adjacent their inner ends the bars 6 and 7 are provided with openings 20 and 21 adapted to be selectively registered with openings 22 and 23 in the frame sections whereby bolts 24 and nuts 25 may be employed to secure the inner ends of said bars to the frame sections when the bars are adjusted to dispose the blade in side-casting and bulldozing positions.

Adjacent their outer ends the bars 6 and 7 are provided with inwardly extending apertured ears 26, the apertures 27 of which are adapted to be selectively registered with openings 28 and the apertures 29 of ears 30 provided at the intermediate portions 13 of the frame sections, whereby as shown in Fig. 1 bolts 31 and nuts may be applied to rigidly secure the bars to the frame sections in such manner as to securely brace the blade supporting structure and also prevent sidewise movement thereof and objectionable torsional stresses.

In accordance with my invention the outer ends of the bars 6 and 7 are directly pivoted at 33 to clevises 34 fixed to the rear lower portions of the ends of the blade. Links 35 are pivoted at 36 on horizontal axes to the bars 6 and 7 and extend upwardly to rearward projections 37 located adjacent the upper edge of the blade, said links having clevises 38 on the upper ends which are pivoted to said projections as at 39 on vertical axes. Brace members 40 are pivoted as at 41 on horizontal axes on the upper sides of the bars 6 and 7 and are inclined upwardly and bolted by means of the threaded ends 42 and nuts 43 to the upper ends of the links 35. The brace members 40, links 35 and pivotal connections thereof provide for securely anchoring the blade to the blade supporting bars and for varying the inclination of the blade from the vertical to positions best suited to the particular work. The pivots of these parts have sufficient play to permit of such adjustment. The nuts 43 are loosened when the blade is being positioned or set and then tightened whereby to provide a rigid blade mounting.

It will now be seen that I have provided a blade mounting or supporting means which will make possible a ready adjustment of the blade to side-cast earth as desired toward either side of the tractor or so as to serve as a bulldozer while maintaining the blade in a horizontal plane and holding the same rigidly in the desired position, and without setting up damaging torsional stresses.

It is important to note that the particular blade mounting thereof eliminates the necessity of employing cross or diagonal bracing members which must be moved from one side to the other when the angle of the blade is reversed, and moreover does away with the necessity of slidably adjusting the tractor pivoted bars or main frame rearwardly of the pivot points or slidably relative thereto. All parts of the frame or mounting lie close to the sides and front of the tractor and are disposed and operated in much smaller compass than blade mountings such as heretofore provided and do not extend rearwardly and thereby interfere with movement of the tractor.

An important provision hereof is that of employing a normally rigid, two section U shaped frame pivoted at its ends to the sides of the tractor and having a pivotal or articulative joint between its sections, and provided with extensible and retractable blade supporting bars telescopically mounted on and extending as continuations of the straight side portions of the frame sections, together with means for locking the frame sections against relative movement at the joint when the blade has been properly angled or set, whereby the mounting becomes a rugged and rigid blade supporting means with the blade maintained in the desired position and parts free from objectionable torsional stresses.

Another important provision hereof is that the convergent or angularly extended portions 13 permit of disposing the blade closer to the front of the tractor than would be possible with a square cornered frame.

Although I have herein shown and described only one form of earth moving or excavating apparatus of the pusher type embodying my invention, it is to be understood that various changes and modifications may be made herein without departing from the spirit of my invention and the spirit and scope of the appended claims.

I claim:

1. A blade mounting for tractors including a sectional frame having certain ends of sections thereof adapted for pivotal connection with opposite sides of the tractor and the other ends of said sections abutting and forming a joint adjacent the longitudinal medial line of the tractor to permit relative movement of said sections; and means for locking said sections against relative movement at said joint.

2. A blade mounting for tractors including a sectional frame having certain ends of sections thereof adapted for pivotal connection with opposite sides of a tractor and the other ends of said sections telescopically engaging one another and forming a joint in front of the tractor to permit relative vertical movement of said sections, means operable at said joint for locking said sections against relative movement, and blade supporting means on said sections, said sections and supporting means having openings therein adapted to be selectively registered for reception of fastening elements, the openings in said supporting means being adjacent opposite ends thereof.

3. Earth moving apparatus for a tractor, in-

cluding a sectional U-shaped frame, certain ends of sections of said frame being overlapping and relatively adjustably engaged at a point substantially centrally of the bight portion of said frame, means associated with said ends for selectively loosening and tightening the joint formed thereby, whereby the sections may be relatively moved or held against such movement, means for loosely pivotally connecting the other ends of said frame with opposite sides of a tractor, and blade supporting means on said frame sections.

4. A mounting for attaching an earth moving blade to a tractor, including a frame having sides and a sectional front adapted to extend along the side and in front of a tractor and having provision for pivoting the free ends of said sides to the tractor, a rotary joint mounted intermediate the ends of the front of said frame adjustable to permit relative movement of said sides, blade attaching means carried by said sides, said joint including telescopically engaged tubular members fixed to the sections of said front and adapted for relative rotation, said tubular members having abutting portions, and means for forcing said abutting portions together to bind the joint and prevent relative rotation of said tubular members.

5. A mounting for attaching an earth moving blade to a tractor, including a sectional U-shaped frame made up of sides adapted to be pivoted to the sides of a tractor, diagonally extending portions formed integral with said sides and extending convergently in front of the tractor, tubular joint members rigidly fixed to said diagonal portions and abutting one another and being relatively rotatable, means for locking said abutting members to prevent relative movement thereof, and blade attaching means carried by said sides.

6. An implement supporting frame for use on tractors, comprising; straight side sections, adapted at certain ends to be pivoted on a tractor, axially aligned front sections, diagonal sections rigidly connecting the other ends of the side sections with certain ends of the front sections, the front sections having their other ends in abutting and relatively rotative relation for permitting rotative adjustment of one side, front and diagonal section with respect to the other sections, and locking means for the joint by which one front, side and diagonal section may be secured in a rotative position of adjustment with respect to the other sections.

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