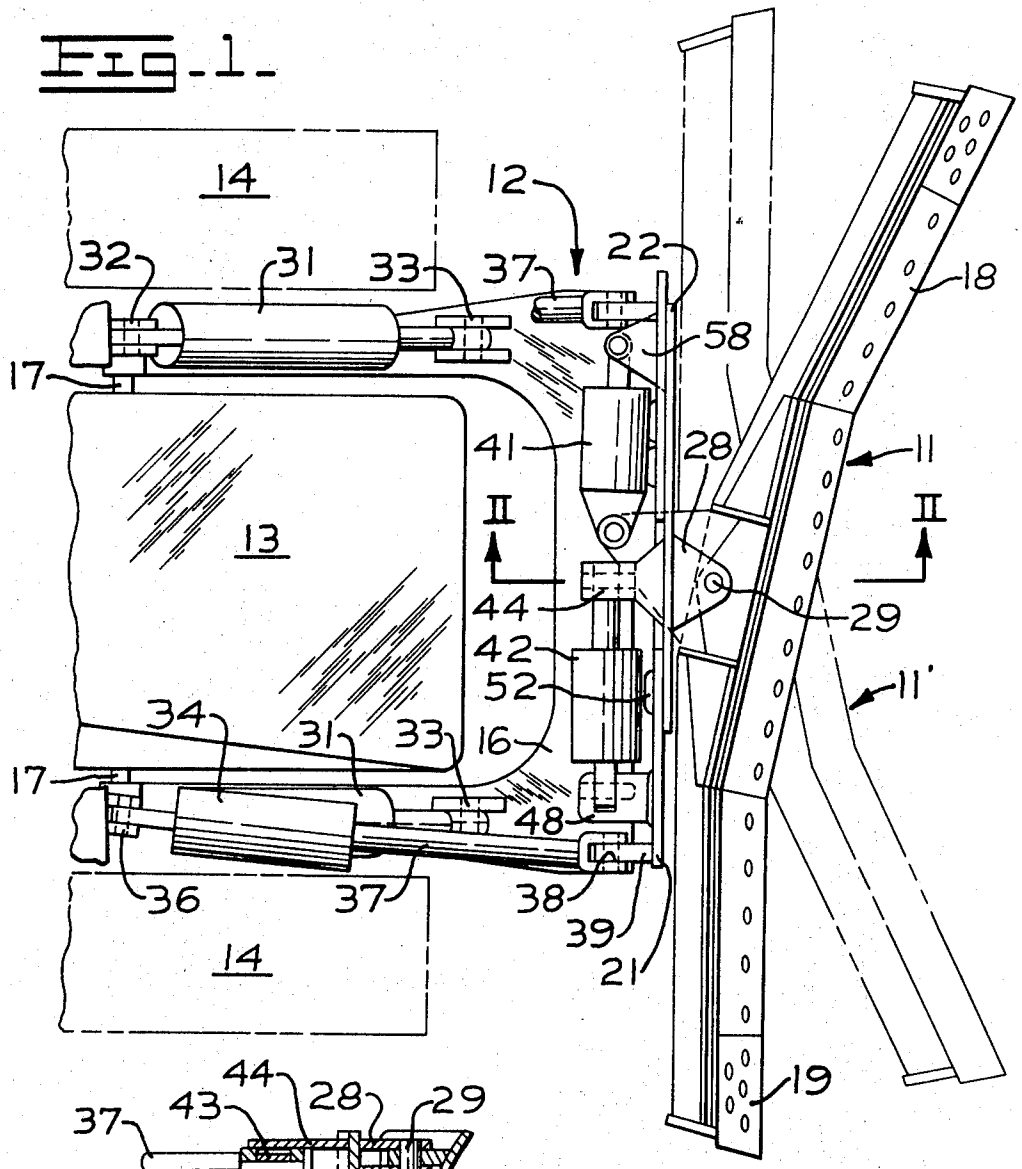
Sept. 22, 1970 M. J. TEASDALE 3,529,678

MOUNTING FOR BULLDOZER BLADES

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Fig. 1.



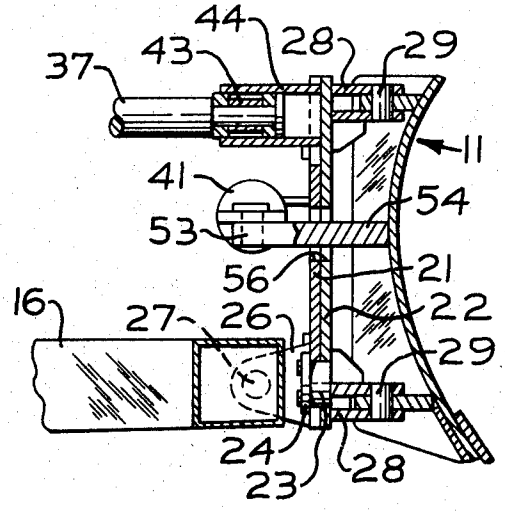


Fig. 2.

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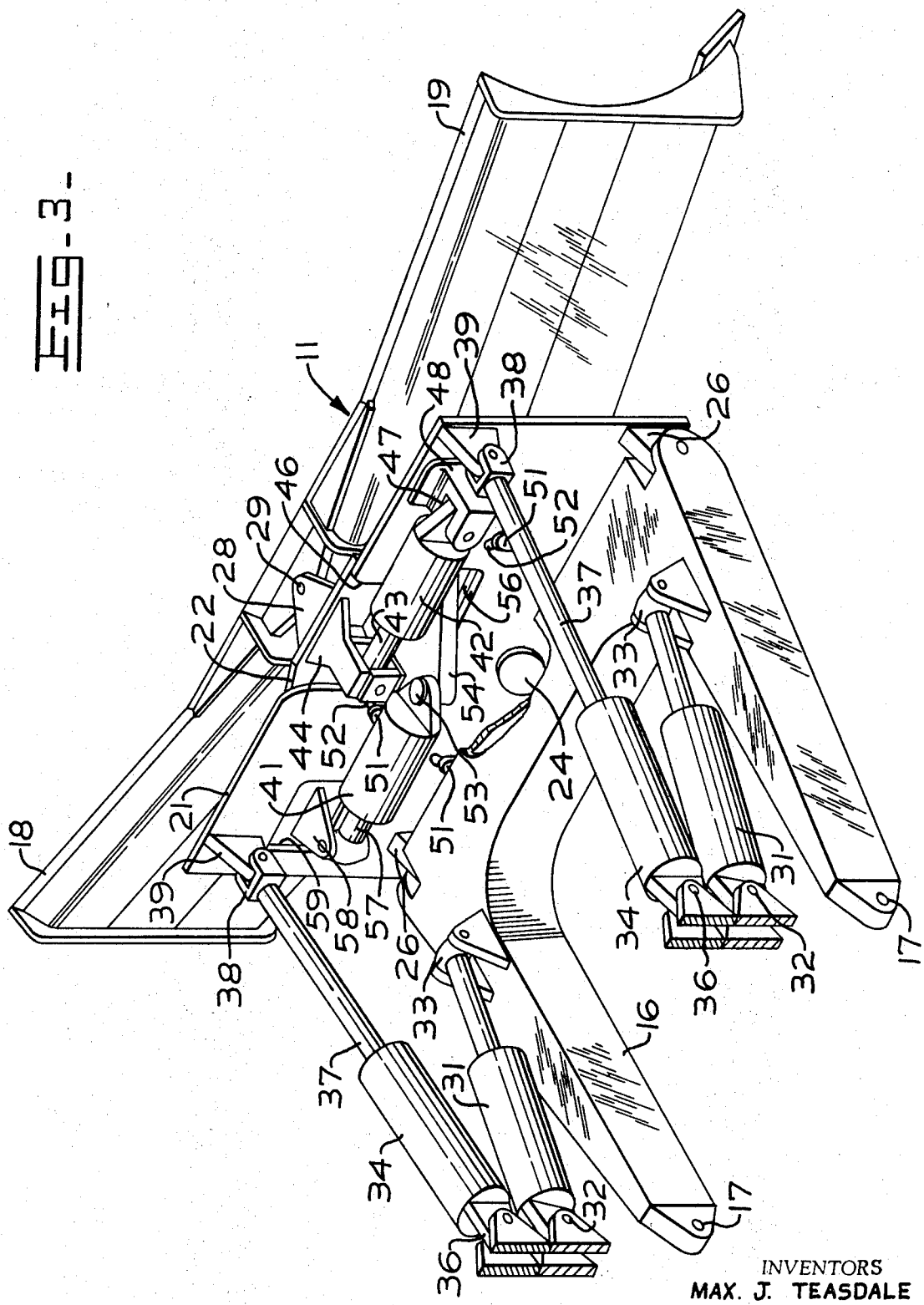
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FIG. 3



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United States Patent Office 3,529,678 Patented Sept. 22, 1970

3,529,678

MOUNTING FOR BULLDOZER BLADES

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Filed Aug. 14, 1968, Ser. No. 752,716
Int. Cl. E02f 3/76
U.S. Cl. 172—804 3 Claims

ABSTRACT OF THE DISCLOSURE

A mounting for supporting a bulldozer blade on a tractor including motors for raising and lowering, tilting, angling and varying pitch of the blade. A pair of support plates are pivoted to each other for relative rotation about a common axis, one of the plates being pivoted to a frame mounted on the vehicle with the blade being pivoted to the other plate with the three pivot axes each being perpendicular to the other two.

In many applications, it is desirable for a bulldozer blade mounting to permit the blade to be raised and lowered, tilted, pitched and angled for performing various earthmoving jobs. The mounting must stably support the blade while permitting it to move in the above manner. Tilting of the blade raises a particular problem. Most prior art designs, for example, cause substantial bending or torsional stresses in the mounting or in the blade itself when the blade is tilted out of a normal position. It is therefore desirable to provide means by which the blade can be tilted without causing substantial stresses in the mounting or in the blades.

It is also desirable to minimize the overall dimension of a vehicle or tractor having a bulldozer blade mounted on one end. Additionally, it is desirable that the blade mounting permit the blade to be raised and lowered without substantially varying the blade pitch.

The present invention provides such a mounting including means for tilting, angling and varying pitch of the blade. A pair of support plates are pivoted to each other with one of the plates being pivoted to a frame mounted on the vehicle and the blade being pivoted to the other plate to permit desired movement of the blade while minimizing stresses developed in the mounting and in the blade.

It is accordingly an object of the present invention to provide a bulldozer blade mounting for minimizing overall dimension of a vehicle supporting a bulldozer blade. It is another object to provide a bulldozer blade mounting which permits the blade to be tilted while minimizing stresses in the mounting and in the blade.

It is also an object to provide a bulldozer blade mounting which maintains generally constant blade pitch while the blade is being raised and lowered.

Additional objects and advantages of the invention are made apparent in the following description having reference to the accompanying drawings.

In the drawings:

FIG. 1 is a plan view of a bulldozer blade supported on the forward end of the vehicle by means of the present mounting;

FIG. 2 is a side elevation view, with parts in section, taken along section line II—II of FIG. 1; and

FIG. 3 is a perspective view of the mounting and bulldozer blade removed from the vehicle for greater clarity.

Referring to FIG. 1, a bulldozer blade **11** is supported by means of a mounting **12** upon the forward end of a vehicle **13** having ground engaging means **14**. The vehicle may be a crawler type tractor as illustrated in FIG. 1 with the ground engaging means **14** being tracks. Referring also to FIGS. 2 and 3, the mounting **12** comprises a generally conventional C-frame **16** supported upon the

vehicle by means of pivots **17** which are located inside the tracks **14** to reduce the overall dimensions of the tractor and blade attachment. The blade **11** is preferably of a U-shaped configuration having forwardly projecting end portions **18** and **19**. The blade configuration is selected so that reduced angling of the blade permits effective side casting of material from either ends of the blade. The blade design also permits increased retention of material in front of the blade, for example during cleanup operations.

The mounting **12** permits angling, tilting and pitching of the blade without causing substantial stresses in the blade or mounting through the use of a pair of plate members **21** and **22**. The plates **21** and **22** are secured together by means of a pivot pin **23** which is held in place by means of a cap **24** and is arranged along a longitudinal axis of the vehicle **13**. Brackets **26** extend rearwardly from each side of the plate **21** and are secured to the frame **16** by pivot joints **27** (see FIG. 2). The pivot joints **27** are arranged along a generally horizontal transverse axis relative to the vehicle **13**. Another pair of brackets **28** extend forwardly from the plate **22** and are pivoted at **29** to the blade **11** along a generally vertical axis. In this manner, pivotal interaction between the plate **21** and the C-frame **16** permits the blade pitch to be varied. Interaction of the plates **21** and **22** about the pivot pin **23** permits the blade to be tilted. Also, pivotal interaction of the blade with respect to the plate **22** about the pivot axis **29** permits the blade to be angled, for example, between its position shown at **11** and a position illustrated in broken lines at **11'**. The blade may accordingly be moved to any desired position without substantially increasing stresses in either the blade **11** or the mounting **12**.

To selectively raise and lower the blade **11** along with the mounting **12**, a pair of hydraulic motors or cylinders **31** are pivotally interconnected between the sides of the vehicle **13** by means of pivot joints **32** and the C-frame by means of pivot joints **33**. Extension of the cylinders **31** tends to lower the blade relative to the vehicle while retraction of the cylinder tends to raise the blade.

A pair of hydraulic cylinders **34** are arranged between the vehicle and the plate member **21** to selectively vary pitch of the blade **11**. The cylinders **34** are affixed to the vehicle by means of pivot joints **36** while their rod ends **37** are secured by pivot joints **38** to brackets **39** which extend rearwardly from the plate member **21**. Referring particularly to FIG. 2, the pitch jacks **34**, as represented by the one rod **37** and the C-frame **16** generally form two sides of a parallelogram support for the blade so that blade pitch remains substantially constant while the blade is being raised and lowered by means of the jacks **31**.

Use of the parallel plates **21** and **22** permits the arrangement of angling and pitching motor means **41** and **42**, respectively, so that they are protected by means of the plates from engagement with dirt or rocks. Further the arrangement of these two motors facilitates minimized overall lengths for the vehicle and blade attachments. The titlting motor or hydraulic cylinder **42** has its rod **43** pivotally secured to a bracket **44** which extends rearwardly from the plate member **22** through an enlarged opening in the other plate member **21**. The opening **46** is sufficiently large so that the bracket **44** does not interfere with the plate member **21** during relative tilting of the blade **11** and plate member **22**. The other end of the tilt cylinder **42** is pivotally secured at **47** to a bracket **48** mounted on the plate member **21**. During tilting of the blade **11**, the plate member **22** is rotated relative to the plate member **21** about the pivot pin **23** (see FIG. 2). To further stabilize the mounting while still permitting relative rotation of the plate members **21** and **22**, a plurality of lugs **51** project rearwardly from the plate member **22** through arcuate slots **52** formed in the other plate member **21**.

The lugs **51** and slots **52** are arranged circumferentially about the pivot pin **23** to permit relative rotation of the plate members **21** and **22** during titlting of the blade **11** while providing structural reinforcement between the plate members **21** and **22**.

The hydraulic cylinder **41** for controlling blade angling is pivotally connected at **53** to a bracket **54** which projects rearwardly from the blade **11** through an enlarged opening **56** in both of the plate members **21** and **22**. The opening **56** is sufficiently large so that the bracket **54** does not interfere with either of the plate members as the blade is being angled by means of the hydraulic cylinder **41**. The rod **57** of the angling cylinder **41** is pivotally secured to a bracket **58** which extends rearwardly from the plate member **22** through an enlarged opening **59** in the plate member **21**. The opening **59** is sufficiently large so that the bracket **58** does not interfere with the plate member **21** during relative rotation of the plate members by means of the tilting cylinder **42**.

What is claimed is:

1. A mounting assembly for supporting a bulldozer blade upon a vehicle, comprising:

a frame member pivotally supported on one end of the vehicle,

one plate member secured to the frame member by means of a pivot connection having a transverse and horizontal axis, a member being pivotally interconnected between the one plate member and the vehicle to establish pitch of the one plate member,

another plate member pivotally mounted on the one plate member for permitting coplanar pivotal motion between the plate members about a tilt axis lying in generally longitudinal relation with respect to the vehicle,

a generally vertical pivot connection supporting the blade upon the other plate member and forming an angling axis,

a linear motor for tilting the other plate member and blade, the titl motor being interconnected between the plate members and arranged in parallel relation thereto, and

a linear motor for angling the blade being interconnected between the other plate member and a bracket extending rearwardly from the blade, the angling motor being arranged in generally paralle relation with the other plate member,

the frame member and pitch controlling member forming opposite sides of a parallelogram as viewed from a side of the vehicle and mounting to maintain substantially constant pitch in the blade as it is raised and lowered relative to the vehicle with the blade positioned for generally vertical pitch.

2. A mounting assembly for supporting a bulldozer blade upon a vehicle, comprising:

a frame member pivotally supported on one end of the vehicle,

one plate member secured to the frame member by means of a pivot connection having a transverse and horizontal axis, a member being pivotally interconnected between the one plate member and the vehicle to establish pitch of the one plate member,

another plate member pivotally mounted on the one plate member for permitting coplanar pivotal motion between the plate members about a tilt axis lying in generally longitudinal relation with respect to the vehicle,

a generally vertical pivot connection supporting the blade upon the other plate member and forming an angling axis,

a linear motor for tilting the other plate member and blade, the tilt motor being interconnected between the two plate members and arranged in parallel relation thereto, and

a linear motor for angling the blade being interconnected between the other plate member and a bracket extending rearwardly from the blade, the angling motor being arranged in generally parallel relation with the other plate member,

the angling motor being mounted parallel to and behind the one plate member by means of one bracket extending rearwardly from the blade through enlarged openings defined by both plate members and another bracket extending rearwardly from the other plate member through an enlraged opening in the one plate member.

3. The invention of claim **1** wherein the member maintaining pitch of the one plate member together with the other plate member and the blade is a linear motor providing for adjustment of blade pitch.

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U.S. Cl. X.R.

172—484, 739, 809