Aug. 6, 1968 L. A. WIRT 3,395,764

DIAGONAL BRACING AND BULLDOZER BLADE MOUNTING

Filed Aug. 2, 1965

Fig. 1.

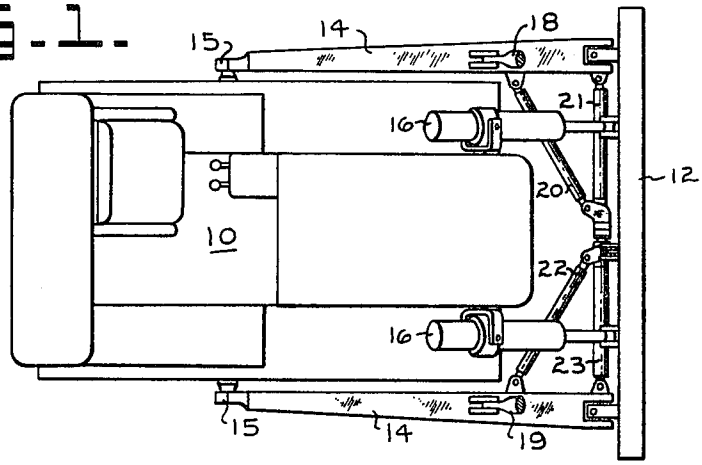


Fig. 2.

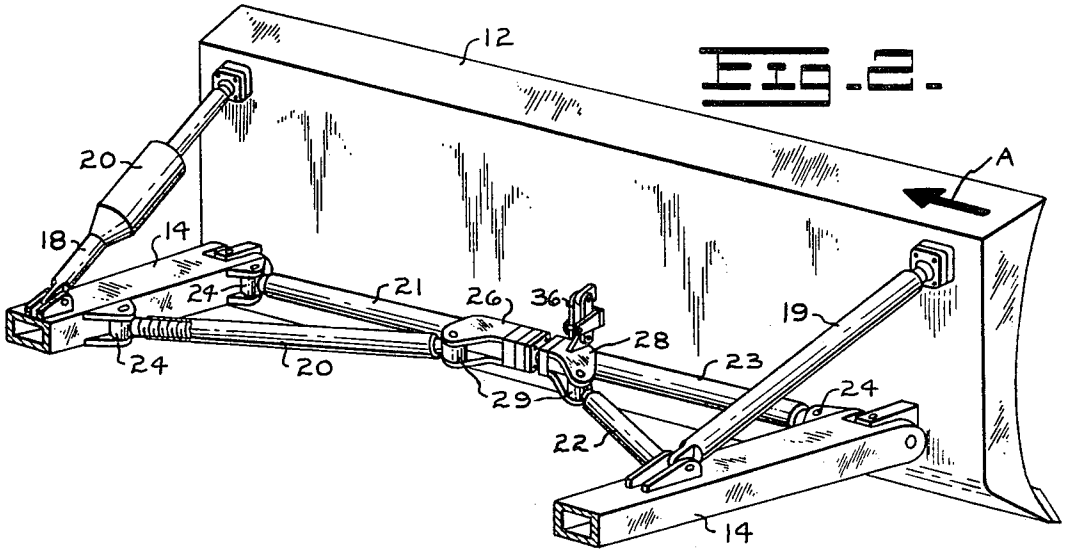


Fig. 3.

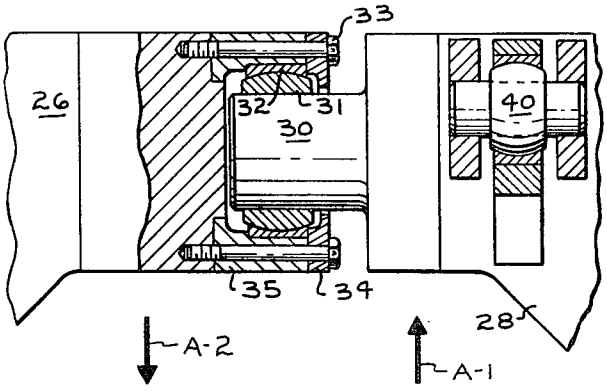
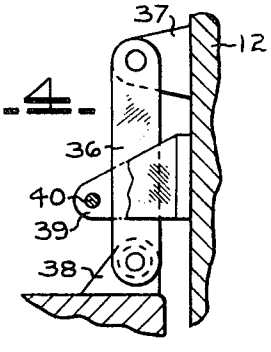


Fig. 4.



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United States Patent Office

3,395,764
Patented Aug. 6, 1968

3,395,764

DIAGONAL BRACING AND BULLDOZER BLADE MOUNTING

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Filed Aug. 2, 1965, Ser. No. 476,339
3 Claims. (Cl. 172—803)

ABSTRACT OF THE DISCLOSURE

Bracing for bulldozers and particularly to means for bracing bulldozer blades to prevent damage resulting from stresses which are set up when the blade is adjusted to its tilt position and also to distribute stresses which result upon side loading of the blade.

Reference is made to the Liess Patent 3,025,620, the Lichti Patent 3,049,820 and the Lichti Patent 3,049,821, all of which deal with the problem of diagonal bracing and tilting the blades and with the proper distribution of stresses in the push arms of the tilting blade when it is tilted. The latter of the Lichti patents illustrates diagonal bracing designed particularly for very large blades but since the diagonal braces are formed as integral parts of the blades, they are unwieldly to assemble and handle and lack desirable adjustment to enable centering of the blade upon assembly and to make up for manufacturing tolerances and wear during use.

It is the object of the present invention to provide improved diagonal bracing for bulldozer blade mounting and to provide for equal distribution of stresses resulting from side loading of a tilted blade and relief of such stresses as they tend to bend the bulldozer push arms.

Further and more specific objects and advantages of the invention are made apparent in the following specification wherein reference is made to the accompanying drawing.

In the drawing:

FIG. 1 is a plan view of a tractor equipped with a bulldozer embodying the present invention;

FIG. 2 is a perspective view of the bulldozer with the rear portion of the push arms broken away;

FIG. 3 is an enlarged fragmentary detail partially in section illustrating the connection between the inner ends of the diagonal bracing of the present invention; and

FIG. 4 is an enlarged fragmentary detail of link means which support the inner ends of the diagonal braces with respect to the blade.

FIG. 1 shows a tractor **10** fitted with a bulldozer **12** on the forward ends of push arms **14**, the rear ends of which are pivotally connected to the tractor at points **15**. A pair of hydraulic jacks **16** is connected between the tractor and the bulldozer blade to raise and lower the blade in a well known manner. Tilt braces **18** and **19**, only partially shown in FIG. 1 but better illustrated in FIG. 2, serve to hold the blade **12** in a substantially vertical position or at a slight pitch or variation from vertical. One of the tilt braces here shown at **18** includes hydraulic jack means **20** capable of operation from the operator's station of the tractor in a well known manner to vary the length of the brace and impart raising or lowering motion to one end of the bulldozer blade **12** giving the blade what is known as tilt.

This tilting of the blade creates certain stresses in the push arms, all fully described in the earlier patents mentioned above, and establishes a condition in which a force imparted to one end of the blade tending to move it transversely of the tractor often results in breaking of a push arm. These dangerous stresses have been relieved by various arrangements of the diagonal braces between the push arms and the blade as disclosed in the above mentioned patents. In the Lichti Patent 3,049,821, the diagonal braces are heavy, more or less triangularly shaped members extending between the push arms and the blade and are designed for very large bulldozer blades. The present invention is an improvement on the construction shown in said Lichti patent in that it provides as good or better relief of stresses in a tilted blade. It is simpler and more economical to manufacture as well as to transport and assemble and it is fully adjustable to establish a proper position of the blade and to take up slack caused by wear in connecting parts. As best illustrated in FIG. 2, each push arm has a diagonal brace extending toward the central portion of the blade and each brace is made of two struts, the left-most brace being shown as comprising struts **20** and **21** and the right brace as composed of struts **22** and **23**.

All of the struts are connected to the push arms by identical pivotal joints **24** and the struts **20** and **22** are made adjustable as by a threaded connection between a tube and a rod as illustrated in the broken away portion of the strut **20**. The inner ends of the struts **20** and **21** are associated with a block **26** and the inner ends of the struts **22** and **23** are connected with a block **28**. The struts **20** and **22** are connected with their respective blocks as by identical pivotal connections **29**. The inner ends of the struts **21** and **23** are rigidly connected with the blocks **26** and **28**, respectively, and the blocks as shown in FIG. 3 are interconnected by a sliding and swivel joint which comprises a trunnion **30** on the block **28** slidably fitting within a spherical bearing member **31** supported for universal movement in a bearing member **52** which embraces it and is received in the block **26** and retained therein as by cap screws **33** and housing members **34** and **35**. This enables the diagonal braces to move slightly to and away from the blade and they are restrained from vertical movement by links **36** (see also FIG. 4) supported between brackets **37** on the back of the blade and brackets **38** on the block **28**. Links **36** are limited in movement by a U-shaped bracket **39** and a pin **40** therein. The connection between the bottom of the lings **36** and the brackets **38** preferably is a universal connection including a spherical bearing member as shown at **40** in FIG. 3.

With the construction shown when force is applied to the tilted blade in the direction of arrow A in FIG. 2, it tends to move the inner ends of the diagonal braces in opposite directions as indicated by arrows A1 and A2 in FIG. 3 thus stressing the trunnion **30** and eliminating the bending stresses ordinarily imposed on the push arms **14**.

I claim:

1. In a bulldozer blade mounting which includes two push arms secured to opposite sides of a tractor and extending forwardly, a blade connected to the forward ends of said arms, a tilt brace extending between the top of each arm and the back of the blade, and diagonal braces extending inwardly one from the inner side of each arm and centrally connected with each other, each

of said diagonal braces comprising a first strut pivoted to the arms and extending substantially parallel to the blade, and a second strut pivoted to the arm rearwardly of the first strut and converging forwardly to join the first strut generally centrally of the blade.

2. The combination of claim 1 in which the central connection between the diagonal braces includes slidable and universally adjustable means.

3. The combination of claim 2 with means for loosely connecting the diagonal braces to the blade at a generally central location.

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