

[72] Inventor **Claude M. Frisbee**
Burlington, Iowa
 [21] Appl. No. **884,509**
 [22] Filed **Dec. 12, 1969**
 [45] Patented **Jan. 4, 1972**
 [73] Assignee **J. I. Case Company**
Racine, Wis.

2,722,066	11/1955	Wills et al.	172/484
2,927,385	3/1960	Blomquist	37/117.5
3,122,850	3/1964	Rockwell.....	172/803 X
3,234,670	2/1966	Fryer et al.	172/803
3,503,456	3/1970	Larson	172/484 X
3,529,678	9/1970	Teasdale	172/484 X

Primary Examiner—Robert E. Pulfrey
Assistant Examiner—Stephen C. Pellegrino
Attorney—Cullen, Settle, Sloman & Cantor

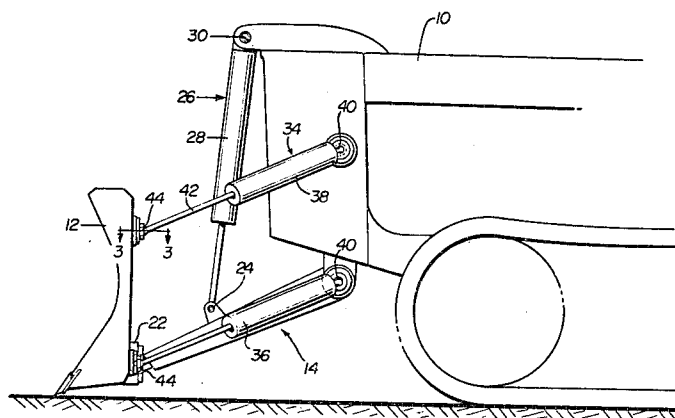
[54] **BULLDOZER**
2 Claims, 3 Drawing Figs.

[52] U.S. Cl. **172/807,**
172/484
 [51] Int. Cl. **A01b 3/76**
 [50] Field of Search..... **172/801,**
803-807, 809, 276, 484; 37/117.5, 41

[56] **References Cited**
UNITED STATES PATENTS

2,374,016 4/1945 Henneuse..... **172/807**

ABSTRACT: A bulldozer having pivotally mounted on the front end an A-shaped push frame which swivelly supports a dozer blade. The angle, pitch and tilt of the blade is adjusted by upper and lower parallel jacks on each side of the bulldozer. The blade is raised and lowered by another jack that interconnects the middle of the push frame with the front of the tractor.



BULLDOZER

This invention relates to improvements in earth moving blade mounting and maneuvering structures adapted, although not exclusively, for use with bulldozers.

The typical dozer blade push frame is of the C-frame type with arms extending along the side of and to the rear of the tractor where the arms are attached for pivotable movement of the frame. Necessarily, the forces imposed on the frame can be high, therefore, the frame must be rather bulky. Also, somewhat complicated structures are required to maneuver the blade on the C-frame. With a C-frame, the blade must be longer to clear the frame when angled. This invention allows the blade to be short.

Accordingly, a new and different dozer blade mounting and maneuvering arrangement is proposed that is simple in construction, that can be installed on the front of the tractor, and that can be easily and conveniently maneuvered to a plurality of positions.

Further contemplated is a dozer blade push support that is swingably mounted on the front of the tractor so as to raise and lower a dozer blade.

A more specific objective is the provision of a unique arrangement whereby a dozer blade push support is swingably mounted on the front of a tractor and swivelably supports the dozer blade, which can be angled, tilted and pitched by double-acting jacks.

The foregoing and other objects and advantages of the invention will become apparent from the following description and the accompanying drawings in which:

FIG. 1 is a fragmentary side elevational view of a bulldozer on which a dozer blade is mounted in accordance with the invention;

FIG. 2 is a perspective view of the dozer blade and the mounting therefor depicted in FIG. 1;

FIG. 3 is a sectional view taken along lines 3—3 in FIG. 1 of one of the universal connections made with the dozer blade.

Referring to the details of the drawings and initially to FIG. 1, the numeral 10 denotes a crawler tractor. The tractor 10 has mounted on the front, an implement such as a dozer blade 12, of the usual construction. The mounting is made by a push frame 14 that is swingably connected to the front of the tractor 10. The push frame 14 is of a generally A-shaped configuration as viewed in FIG. 2 and swivelably supports the dozer blade 12 for tilting, angling, and pitching movements as will be explained.

The swingable connection to the tractor 10 is made by a cross-shaft 16 which connects the back end of the push frame 14 to the front end of the tractor 10. The cross-shaft 16 is arranged substantially perpendicular to the longitudinal axis of the tractor 10 and has swingable or pivotable movement adequate to permit the raising and lowering of the dozer blade 12 to the desired extent. On the front end of the push frame 14 is formed a ball 18 which is received within the socket 20 defined by a portion of the dozer blade 12 and a mounting plate 22. This ball-and-socket connection permits the swivelable movements of the dozer blade 12. In the middle of the push frame 14 are the upstanding arms 24 to which attaches an appropriate lift mechanism such as a fluid operated double-acting lift jack 26 shown in FIG. 1. The upstanding arms 24 being in the middle, i.e., positioned on a line extending from the center of the ball 18 to the center of the back end of the push frame 14 avoids imposing upon the cross-shaft 16 twisting forces.

The lift jack 26 includes a cylinder 28 which is swingably connected to the upper front end of the tractor 10 by a bifurcated bracket shown at 30 lift FIG. 1. The lift jack 26 also includes a piston and rod assembly 32 which attaches to the arms 24 on the push frame 14. Thus, retraction and extension of the piston and rod assembly pivots the push frame 14 up and down about the axis of the cross-shaft 16 and correspondingly raises and lowers the dozer blade 12.

As viewed in FIG. 1, on each side of the tractor 10 at the front end are arranged upper and lower struts, such as double-acting jacks 34 and 36. Each of these jacks may be fluid

operated with the upper jack 34 being typical and including a cylinder 38 which has a universal connection at 40 with the tractor and a piston and rod assembly 42 having a universal connection at 44 with the dozer blade 12.

These universal connections 40 and 44 may be of the ball-and-socket type similar to that made by ball 18 on the end of the push frame 14 with the socket 20 defined by the blade 12 in the plate 22. For example and as shown in FIG. 3, the socket may be formed by the blade 12 and mounting plate 46.

Any suitable control system and fluid pressure source may be employed for operating the various jacks 26, 34 and 36. The control system, of course, would be manually operable in the usual way from the tractor operator's seat.

In operation, as mentioned, the dozer blade 12 is raised and lowered by actuating the lift jack 26 so as to correspondingly raise and lower the push frame 14. To pitch the dozer blade 12 forward the two upper jacks 34 both are extended. Conversely, when it is desired to pitch the dozer blade 12 backwardly, both of the upper jacks 34 are retracted. When it is desired to tilt the dozer blade 12, i.e., raise one end of the dozer blade 12 or rotate the blade 12 about the longitudinal axis of the tractor 10, then one of the upper jacks 34 is extended and the other upper jack 34 is retracted. To angle the dozer blade 12, both of the upper and lower jacks 34 and 36 on one side of the tractor 10 are retracted and those on the other side are extended. In this way, the dozer blade 12 is pivoted about the vertical axis of the tractor 10.

The jacks 34 and 36 on each side of the tractor 10 are mounted so as to be parallel. For example, the jacks 34 and 36 on the left side of the tractor 10 are arranged so that the axis of each cylinder 38 is in substantial parallel alignment. With this parallelism, the dozer blade 12 does not change pitch when raised and lowered by the lift jack 26.

From the foregoing it will be appreciated that a considerably simplified push frame is provided to swivelly support a dozer blade 12 that can be angled, tilted or pitched or a combination of these movements, easily and conveniently.

What is claimed is:

1. In combination with a motor, a dozer blade, an A-shaped frame having one end thereof pivotably connected to the front end of the vehicle and an opposite end thereof swivelly connected to the dozer blade, a lift jack having one end thereof connected to the upper front end of the vehicle and an opposite end thereof connected to approximately the middle of the A-frame and operative to raise and lower the A-frame and correspondingly the dozer blade, power-operated means for selectively maneuvering the dozer blade, the power-operated means including a pair of double-acting fluid-operated upper and lower jacks arranged in substantially parallel relationship on each side of the vehicle, the upper and lower jacks each having universal connections at the opposite ends with the front end of the vehicle and the ends of the dozer blade, with the pivotable connection between said one end of said A-shaped frame and the vehicle being coaxial with the transverse axis through the universal connections between the vehicle and both upper jacks or both lower jacks, so that the blade is pitched forward or backward when the upper jacks on each side of the vehicle are respectively extended or retracted, the blade is tilted when one of the upper jacks is extended and the other upper jack is retracted and the blade is angled when both the upper and lower jacks on one side are extended and the upper and lower jacks on the opposite side are both retracted.

2. In combination with a vehicle, an implement, a push frame having one end thereof pivotably connected to the front end of the vehicle for movement about an axis transverse the longitudinal axis of the vehicle and the opposite end thereof having a ball socket connection with the implement so that the implement is swivelable relative to the frame, means for selectively maneuvering the implement relative to the frame, the maneuvering means including a pair of substantially parallel upper and lower retractable and extensible strut members on each side of the vehicle, each strut member hav-

3

ing its opposite ends universally connected respectively to the vehicle and to the implement, with the pivotable connection between said one end of the push frame and the vehicle being coaxial with the transverse axis through the universal connections between the vehicle and both upper struts or both lower struts, the maneuvering means further including a lift jack

4

having one end thereof connected to the upper front end of the vehicle and the opposite end thereof connected to approximately the middle part of the push frame and operative to raise and lower the frame and correspondingly the implement relative to the front end of the vehicle.

5

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65

70

75