Aug. 9, 1966 J. D. HALL ETAL 3,265,380

RESILIENT PUSH DOZER

Original Filed Aug. 27, 1963 2 Sheets-Sheet 1

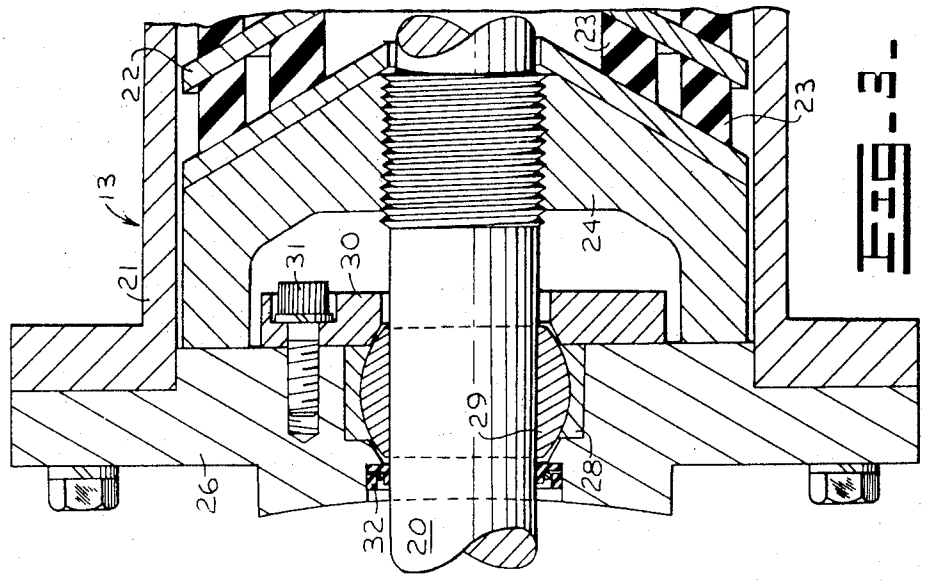


FIG. 3.

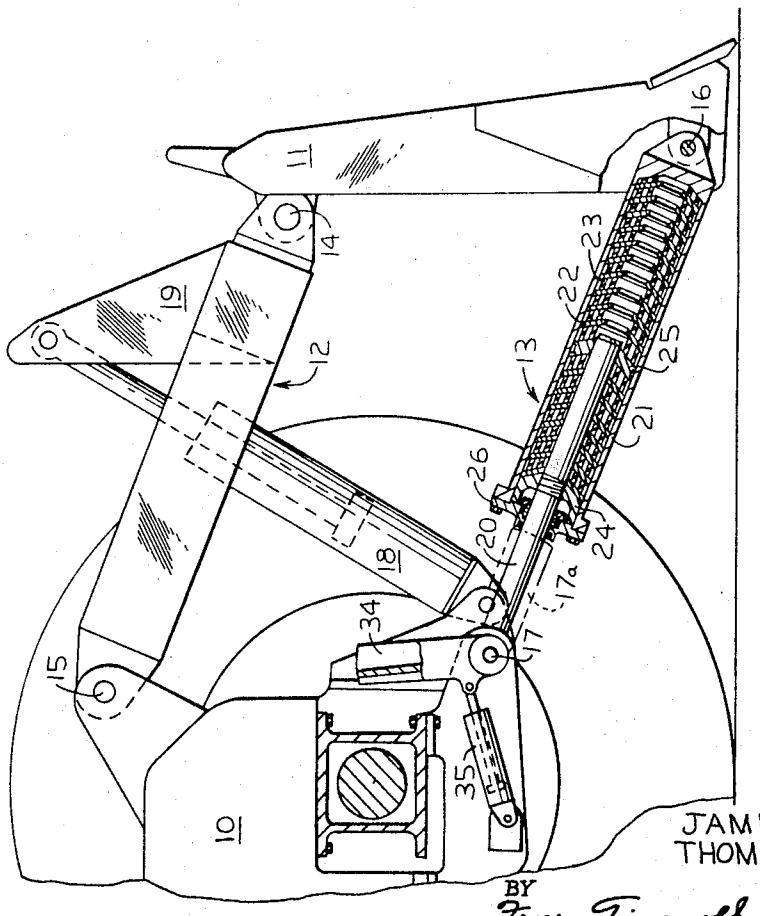


FIG. 1.

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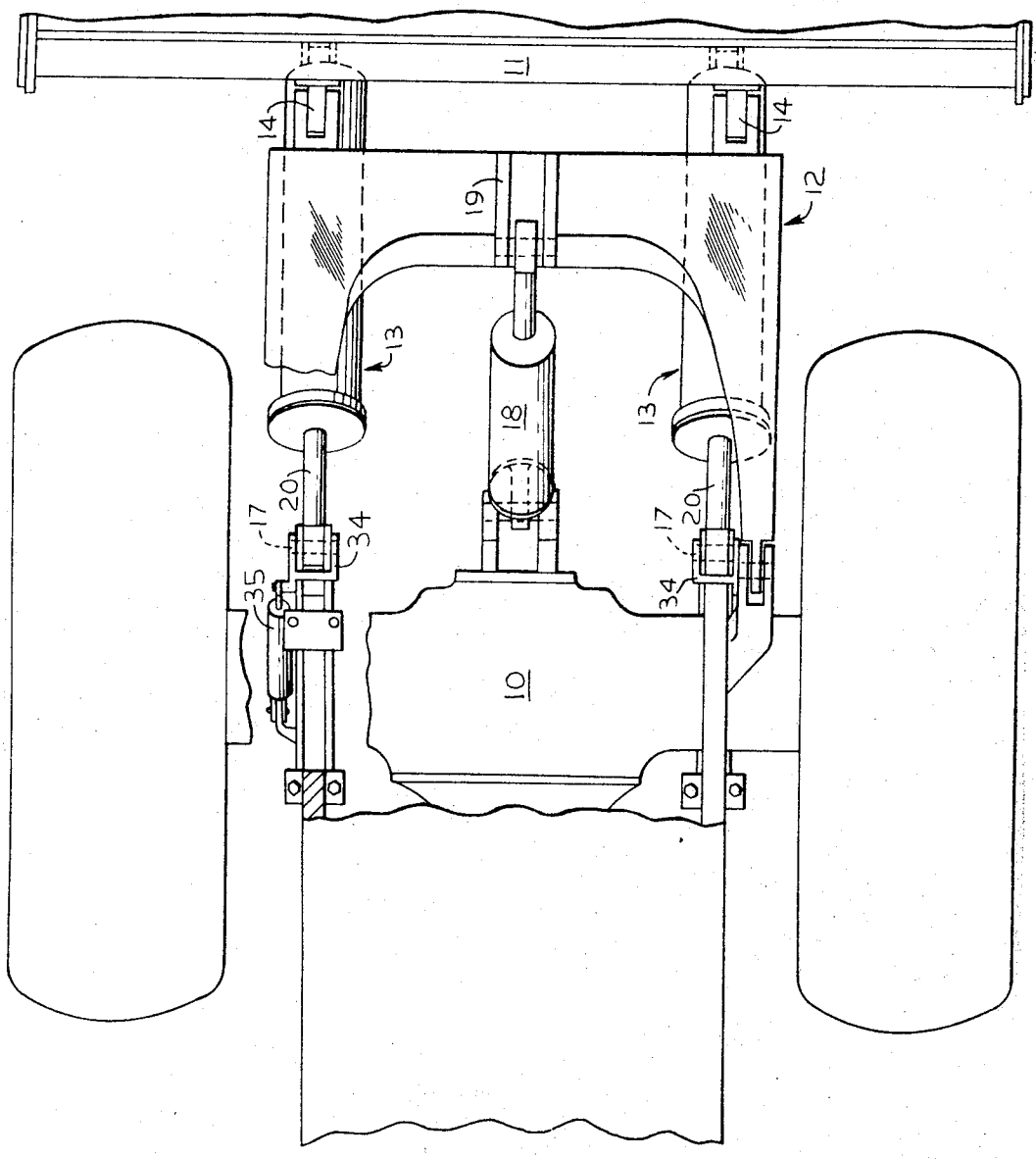


Fig. 2.

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RESILIENT PUSH DOZER

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Original application Aug. 27, 1963, Ser. No. 304,754, now Patent No. 3,238,647, dated Mar. 8, 1966. Divided and this application Sept. 20, 1965, Ser. No. 505,213

2 Claims. (Cl. 267—1)

This is a division of application Serial No. 304,754, filed August 27, 1963, now Patent No. 3,238,647.

This invention relates to push dozers which include resilient means to cushion the shock of impact between pushing and pushing and pushed machines while they are in motion and particularly to means for rendering the resilient means ineffective when the dozer blade is used for other purposes.

Tractor mounted bulldozers have heretofore been resiliently mounted to enable them to be more efficiently used in pushing operations. It has been common practice to place resilient means behind the upper edge of the blade so that the lower edge remains relatively rigid for ordinary bulldozing work when the tractor is not engaged in pushing. While this is an advantage of bulldozing, it is a disadvantage in pushing because when the blade is lowered sufficiently to engage the push blocks of a scraper or other machine in the area of the resilient means on the blade, its lower edge often engages the ground. If it is raised from the ground, the cushion behind its upper edge is not fully efficient.

It is, therefore, the object of the present invention to provide resilient means behind the lower edge of a bulldozer blade so that it can be most efficiently used as a push dozer and to provide means to block or lock out the resiliency of such means while the tractor is used for bulldozing.

Further and more specific objects and advantages of the invention and the manner in which it is carried into practice are made apparent in the following specification wherein the invention is described by reference to the accompanying drawings.

In the drawings:

FIG. 1 is a view in side elevation with parts in section of a resilient push dozer constructed in accordance with the present invention and showing it mounted upon the forward end of a tractor;

FIG. 2 is a plan view of the elements shown in FIG. 1 with parts broken away; and

FIG. 3 is an enlarged cross section of a portion of one of the resilient links of the present invention.

In FIG. 1, the forward end of a tractor, generally indicated at **10**, supports a blade **11** for use either as a push dozer or a bulldozer. The blade is carried on a substantially parallel linkage comprising a C-frame, generally indicated at **12** (see also FIG. 2) and a pair of resilient links, generally indicated at **13**. The C-frame which is rigid is pivotally connected to the upper edge of the blade by pivots **14** and to the tractor by pivots shown at **15**. The links **13** are pivotally connected at their forward end to the lower edge of the blade as at **16** and to the tractor as at **17**. A lift jack **18** is pivotally connected to the tractor and to a bracket **19** extending upwardly from the C-frame and through a conventional hydraulic system (not shown) may be manipulated to vary the height of the blade **11** with respect to the ground.

Each of the resilient links **13** comprises a rod **20** slidable within a cylinder **21** containing a spring pack formed of alternately arranged frusto-conical metallic and rubber elements as shown at **22** and **23** respectively (see also FIG. 3). At the end of the cylinder **21** through which the rod enters, a piston-like element or abutment **24** is

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threadedly secured to the rod and forms a seat for the end of the spring pack. A similarly shaped metallic element **25** is disposed within the spring pack approximately centrally thereof and is slidable with respect to the rod **20** and also with respect to the cylinder **21**. This serves to guide the rod for movement coaxially in the cylinder and to prevent cocking movement thereof which would impart undesirable stresses to the head of the cylinder. The head of the cylinder, as best shown in FIG. 3 at **26**, contains a spherical type bearing **28** and mating bushing **29** through which the rod slides to provide for self adjustment in the even that slight cocking of the rod does occur. The bearing is held in place by a plate **30** inside of the head and cap screws **31** as shown. A conventional seal **32** is provided to exclude foreign matter and retain lubricant in the area of the bearing.

With the arrangement shown, the plate **11** may be raised to a position where its lower portion meets a push block or other member against which pushing force is to be exerted and the resilient links will be directly in line with the point of shock so that their full resiliency is effective when the lower portion of the blade moves rearwardly compressing the resilient members **23** in the cylinder. During absorbing of such shocks, it is necessary for the cylinder to move rearwardly with respect to the rod **20** so that the resilient portion can be compressed between the member **24** on the rod and the opposite end of the cylinder.

When it is desired to eliminate the resilient effect described, means are employed to prevent the necessary movement of the cylinder **21** with respect to the rods **20** accomplished by a pair of blocking members **34** which are generally U-shaped in cross section and have a pivotal connection with the tractor coaxial with that of the rod **20** and preferably using the same pins **17** as shown in FIG. 2.

When resiliency is desired, the blocking members **34** occupy the position shown in the drawings and when it is desired for the links **13** to be rigid, they are swung downwardly to the dotted line position indicated at **17***a* in FIG. 1. In the latter position, the free ends of the blocks lie directly behind the head **26** of the piston to prevents relative movement thereof with respect to the rod. A convenient means for moving the blocking members **34** from one position to the other is illustrated as a pair of small hydraulic jacks **35** pivotally connected between the tractor and the blocking members and connected with a controlled source of fluid under pressure by means, not shown, and in a conventional manner. Controls for the jacks **35** may be disposed adjacent the tractor operator's station for his convenience in quickly changing the links **13** from resilient members to rigid members.

What is claimed is:

1. A resilient link for cushioning shock imparted to a push dozer blade or the like which comprises a cylinder, a rod extending into one end of the cylinder and having a piston thereon, cushioning material between the piston and the opposite end of the cylinder, said rod extending inwardly through a part of said cushioning material and a rigid guide slidable with respect to the rod and the cylinder wall to prevent cocking of the rod.

2. The combination of claim **1** and a self aligning bearing between the rod and the end of the cylinder through which it extends.

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