

July 27, 1948.

J. B. JARMIN

2,446,136

EARTH HANDLING MACHINE

Filed Sept. 4, 1945

2 Sheets-Sheet 1

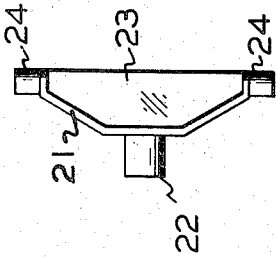


Fig. 3.

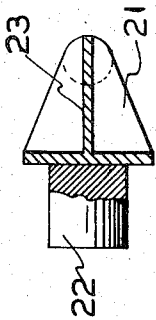


Fig. 4.

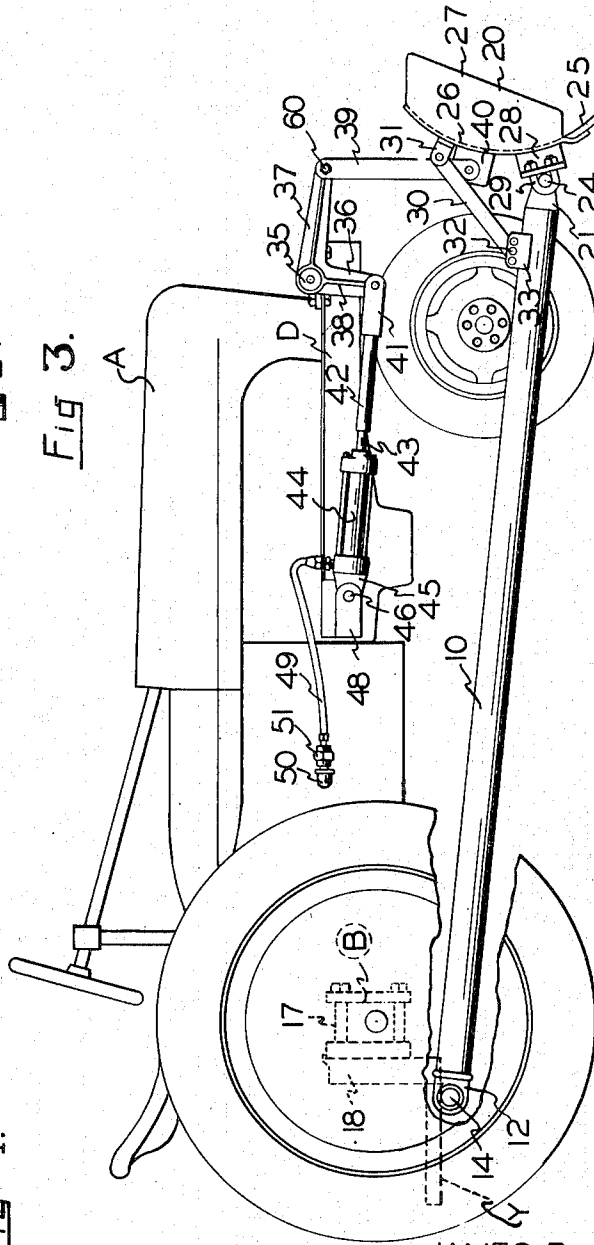


Fig. 1.

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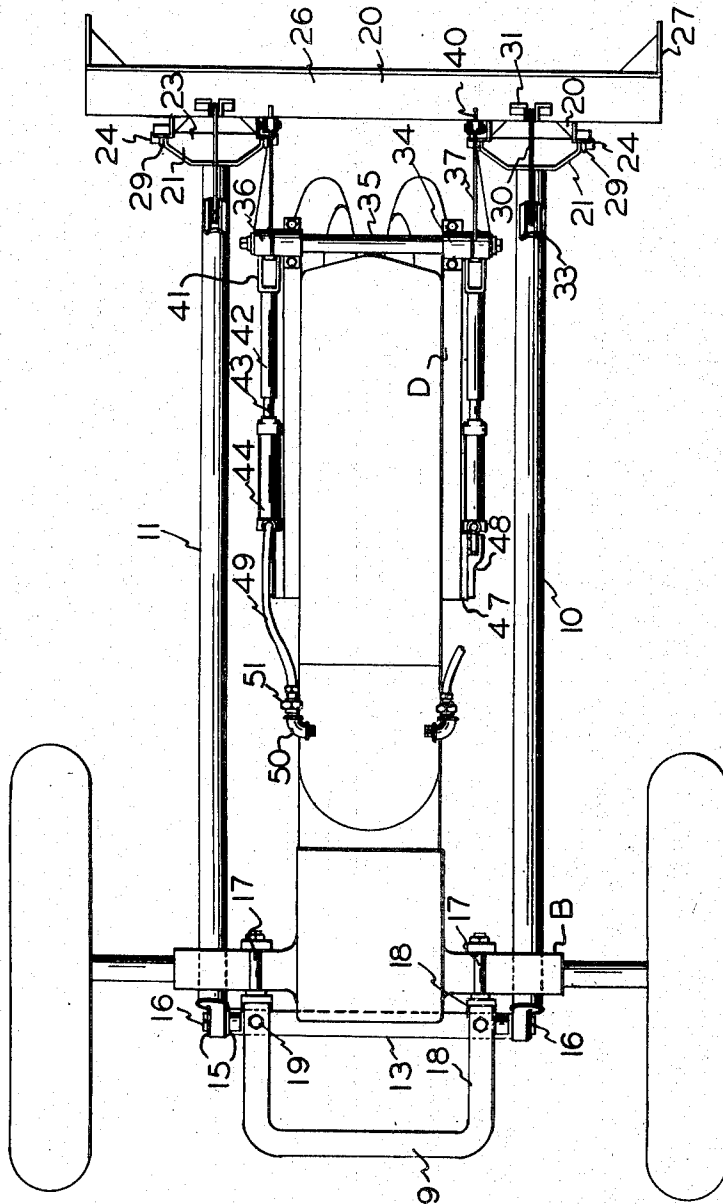


Fig. 2.

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UNITED STATES PATENT OFFICE

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EARTH HANDLING MACHINE

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Application September 4, 1945, Serial No. 614,148

3 Claims. (Cl. 37-144)

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This invention relates to new and useful improvements in earth handling machines.

One object of the invention is to provide an improved earth handling machine of the type known as bulldozers.

A particular object of the invention is to provide a bulldozer wherein the dozer blade while adjustably mounted, is sustained and braced in a new and novel manner, whereby the cutting stress is more uniformly distributed and the blade is adequately supported against longitudinal twisting, thus making for more efficient dozing.

A further object of the invention is to provide an improved blade mounting which may be attached to the rear axle of an ordinary tractor, whereby the load thrust is taken by the rear axle at a lower center of gravity and the tractor frame is left free for the installation of supporting and adjusting linkage.

Another object of the invention is to provide an improved bulldozer having novel and simple linkage mechanism for supporting and adjusting the blade; together with hydraulic means for actuating said linkage.

Still another object of the invention is to provide an improved mounting bracket for a dozer blade having adequately spaced blade-attaching elements, whereby a pair of such brackets may be attached to the mouldboard and push bars immediately above the cutter blade, thus not only more directly taking the load thrust, but reducing displacement and twisting of the blade, transversely of the direction of travel of said blade.

A construction designed to carry out the invention will be hereinafter described together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, wherein an example of the invention is shown, and wherein:

Fig. 1 is a side elevation of a bulldozer constructed in accordance with the invention.

Fig. 2 is a partial plan view of the same.

Fig. 3 is a detail of one of the blade yokes, and

Fig. 4 is a sectional view of the same.

In the drawings, the numerals 10 and 11 designate complementary push bars disposed longitudinally on each side of a tractor indicated generally by the letter A. These bars are preferably tubular, which gives them strength and rigidity, and makes them much lighter than solid bars. At the rear end of each bar, the shank of an eyeplug 12 is inserted and suitably secured by welding or other means. The rear ends of the push bars are connected by a bridle bar 13, having shanks or trunnions 14 welded to the ends thereof. The eyes of the plugs 12 are journaled on the trunnions between washers 15 and are confined by cotter pins 16.

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While the rear ends of the push bars may be connected with the rear axle of the tractor, I prefer to mount it across the usual drawbar yoke Y. The drawbar yoke extends transversely and is carried by angular hangers 18 on the rear side of the axle B. These hangers are secured to the axle housing by clamps 17. The bridle bar 13 is secured to the underside of the yoke by bolts 19, thus making it possible to remove said bolts and lower the rear end of the push bar assembly to the ground. By suspending or hanging the rear ends of the push bars from the rear axle, their center of gravity is lowered and they may be readily attached to various makes of tractors.

The push bars 10 and 11 have their forward ends terminating in front of the front wheels C of the tractor, and pivotally support the dozer blade indicated generally at 20. The manner of pivoting the blade to the forward ends of the push bars is important, and forms one of the novel features of the invention. At the forward end of each bar, a bracket or yoke 21 is secured and each yoke has a rearwardly projecting central shank 22 telescoping the end of the bar and secured therein by welding or other fastening means. Each yoke is provided with a transverse web 23, which is disposed longitudinally of the blade 20, and gives strength and rigidity to the yoke. At each side, the yoke is provided with outwardly and laterally extending trunnions 24.

The dozer blade 20 includes a longitudinal cutter blade 25 along its bottom, which is secured to the lower longitudinal edge of a transverse mouldboard 26, which is curved upwardly and provided at each end with wings 27. The dozer blade is of ordinary construction, and any type may be employed. Angular brackets 28 are welded to the rear side of the mouldboard 26 near its bottom, and are spaced apart so as to register with the trunnions 24. These brackets are provided with U-bolts 29, which engage around the trunnions 24 and pivot the blade 20 to the yokes, whereby said blade may be adjusted arcuately in a vertical plane. It will be observed that the yokes are attached to the blade inwardly of the ends thereof, and the trunnions of each yoke are spaced sufficiently to adequately brace the blade and prevent twisting thereof in a horizontal plane. It is pointed out that the load thrust is sustained by the push bars 10 and 11, and this thrust is contributed to the rear axle of the tractor at a low center of gravity, thus making for efficient bulldozing.

As the push bars are pivoted to the lower portion of the mouldboard 26, it is necessary to brace the upper portion of said mouldboard in order to hold it in position when the excavated earth or soil accumulates against said mouldboard, between the wings 27. For this purpose, inclined brace bars 30 have their upper ends pivoted be-

tween ears 31 secured to the upper rear sides of said mouldboard, and their lower ends supported on bolts 32 between clips 33 welded on the forward ends of the push bars. It will be observed that the brace bars 30 are axially aligned with the push bars and overhang the yokes centrally thereof. By this arrangement, the co-action of the trunnions 24 and brackets 28, and ears 31 provide at each push bar, a triangular brace for the dozer blades 20; such brace being of sufficient amplitude to adequately sustain the rearward thrust of said blade. It is also pointed out that the combination of the pivot points 24, 31 and 32 provides at each yoke a triangular longitudinal brace which aids in contributing the rearward thrust to each push bar.

It is desirable to vertically adjust the dozer blade 20 so that the cutter 25 may not only be positioned to cut to the desired depth, but maintained in its adjusted position, and this is best done by hydraulic mechanism. On the forward end of the tractor frame G, pillow blocks 34 are mounted at each side, and a transverse rock shaft 35 is journaled therein with its ends projecting beyond said blocks. On each end of the shaft 35, a bell-crank lever 36 is suitably fastened. The long arm 37 of each lever projects forwardly, while the short arm 38 extends downwardly. Links 39 have their upper ends pivoted to the forward ends of the arms 37, and their lower ends pivoted to ears 40, on the rear side of the mouldboard 26 at the medial portion thereof.

To the lower end of each arm 38 of the bell-crank levers, a clevis 41 is pivoted, and has the forward end of the pitman 42 suitably secured thereto. The rear end of the pitman is formed integral with the piston rod 43 of a hydraulic cylinder 44, which is pivotally mounted on the side of the frame D. For pivotally mounting the cylinder, a bracket 45 is secured to its rear end, and this bracket is journaled on a stud 46 projecting outwardly from a space block 47, secured to the tractor frame. For confining the bracket on the stud, an offset keeper 48 is suitably fastened on the block.

A flexible hose 49 is secured to the rear end of the cylinder, and is connected at its rear end with an elbow 50 by means of a union 51. The elbow is connected with a suitable source of hydraulic supply, such as an ordinary fluid pump (not shown), which is connected to the power take-off (not shown) of the tractor, as is common practice with such pumps. Fluid may be supplied to and exhausted from the cylinder 44 to move the piston rod 43 forwardly or rearwardly, whereby the bell-crank levers 36 are swung, and the blade 20 is raised and lowered. By using a hydraulic system, and employing a liquid such as oil, when the piston rods 43 are moved forwardly and the supply of fluid is cut off, such fluid will be trapped in the cylinders and prevent rearward movement of the rods 43, thus sustaining the dozer blade and preventing the cutter 25 from cutting below the desired grade. By supplying fluid to the cylinders 44, the levers 36 are swung to elevate the dozer blade.

It will be observed that the bell-crank levers 36 being fastened to the ends of the rock shaft 35, provide a transversely mounted U-shaped support for the links 39 and the blade 20. This arrangement forms an adequate brace against

one end of the blade 20 being displaced upwardly, because one bell-crank lever cannot be swung without swinging the other lever. The upper ends of the links 39 are pivoted to the arms 37 of the levers 35 by means of bolts 60. By removing the bolts 60 the entire front assembly may be dropped to the ground. When it is desired to detach the bulldozer equipment from the tractor, it is merely necessary to remove the bolts 19 and 60. The assembly being underslung and dropping to the ground, it is only necessary to back the tractor therefrom to use it for other purposes.

The foregoing description of the invention is explanatory thereof and various changes in the size, shape and materials, as well as in the details of the illustrated construction may be made, within the scope of the appended claims, without departing from the spirit of the invention.

What I claim and desire to secure by Letters Patent is:

1. A bulldozer including, a pair of longitudinal push bars, means for pivoting the rear ends of the bars to a tractor, a pair of yokes, each yoke having means for rigidly securing it to the front end of one of the bars and a transverse web, said yoke also having trunnions extending outwardly and separated by the web, a dozer blade, angular brackets rigidly attached to the rear side of the blade, and U-bolts secured in the brackets and in which the yoke trunnions are pivoted.

2. A bulldozer including, a pair of longitudinal push bars, means for pivoting the rear ends of the bars to a tractor, a pair of yokes, each yoke having means for rigidly securing it to the front end of one of the bars and a transverse web, said yoke also having trunnions extending outwardly and separated by the web, a dozer blade, angular brackets rigidly attached to the rear side of the blade, U-bolts secured in the brackets and in which the yoke trunnions are pivoted, the ends of the yoke abutting said U-bolts to hold the blade against lateral shifting, and inclined braces having their lower ends pivoted on the bars and their upper ends pivoted to the rear side of the blade.

3. A bulldozer including, a pair of longitudinal push bars having tubular front ends, means for pivoting the rear ends of the bars to a tractor, a pair of yokes, each yoke having a rearwardly extending central shank telescoping the front end of one of the bars and a transverse web and also trunnions extending outwardly separated by the web, a dozer blade, angular brackets rigidly attached to the rear side of the blade, and U-bolts secured in the brackets and in which the yoke trunnions are pivoted.

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