

Dec. 1, 1942.

G. W. MORK

2,303,379

BULLDOZER

Filed Aug. 9, 1941

2 Sheets-Sheet 1

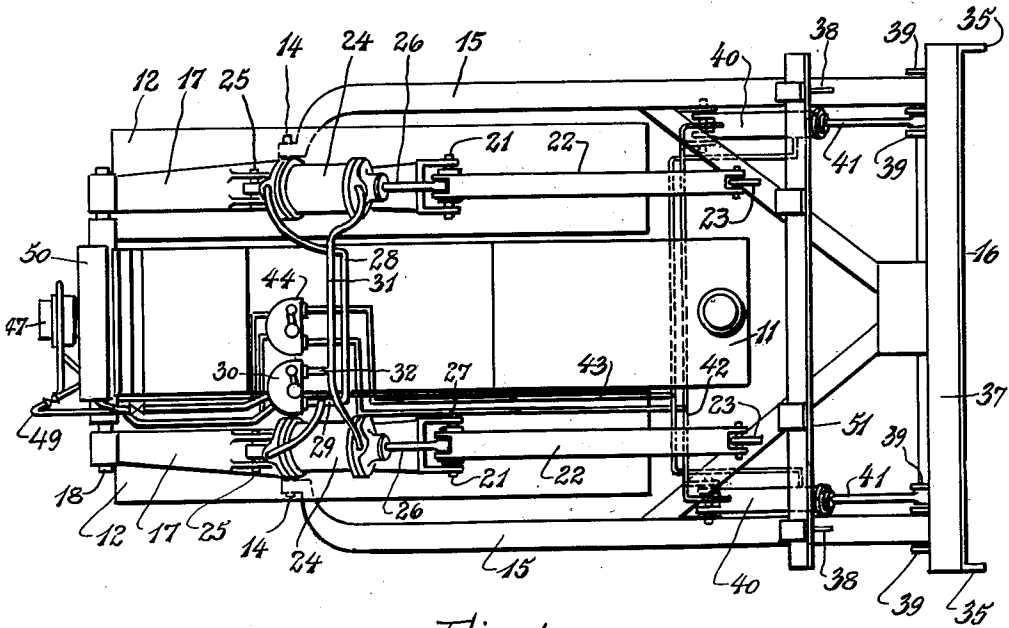


Fig. 1.

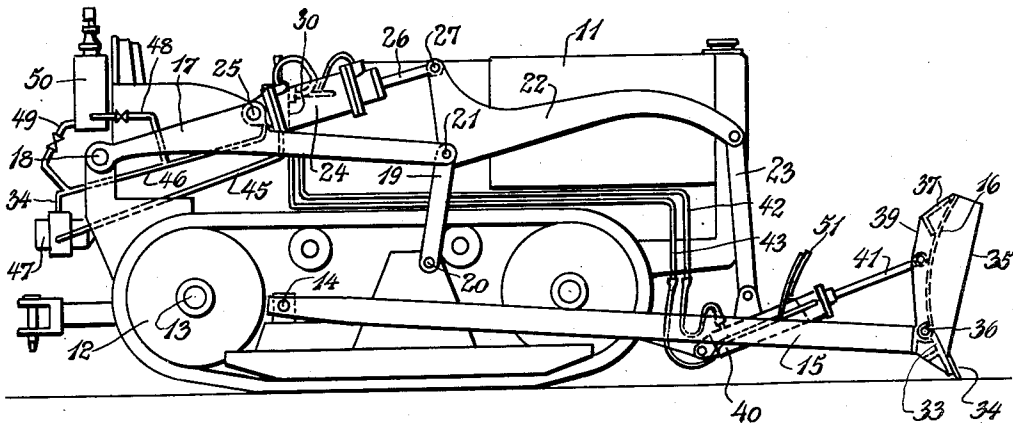


Fig. 2.

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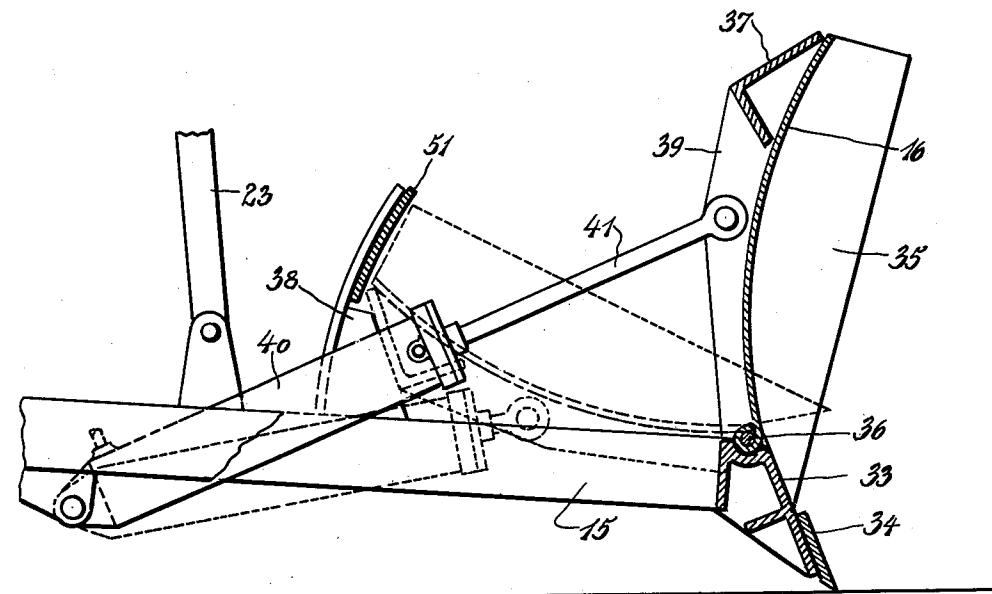


Fig. 3.

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UNITED STATES PATENT OFFICE

2,303,379

BULLDOZER

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Application August 9, 1941, Serial No. 406,091

5 Claims. (Cl. 37—144)

My invention relates to new and useful improvements in bulldozers, and more particularly to that type of bulldozer in which the scraping moldboard is pushed ahead of a tractor.

Such devices are usually designed for attachment to some conventional type of tractor. They consist of a moldboard, two arms pivoted on the tractor for pushing the moldboard, and means to raise and lower either arm with a certain degree of independence from the lowering and raising of the other arm. The last-mentioned means usually consists of one or two hydraulic cylinders actuated by a pump driven by the engine of the tractor.

The moldboard is usually concave toward the front in vertical cross-section, the ends being closed by flat plates. But such an implement is adapted merely to push dirt along ahead of it, rather than to carry the dirt.

Accordingly it is the principal object of my invention to modify the conventional bulldozer so that it may carry dirt, as well as push it.

In addition to my principal object, above stated, I have worked out a number of novel and useful details, which will be readily evident as the description progresses.

My invention consists in the novel parts and in the combination and arrangement thereof, which are defined in the appended claims, and of which one embodiment is exemplified in the accompanying drawings, which are hereinafter particularly described and explained.

Throughout the description, the same reference number is applied to the same member or to similar members.

Figure 1 is a plan view of a tractor and bulldozer embodying my invention.

Figure 2 is a side elevation of this same tractor and bulldozer.

Figure 3 is an enlarged side elevation, partly in section, of the moldboard and associate parts of my invention, in pushing position; showing dotted these parts in carrying position.

Referring now to the figures, we see that 11 is a conventional tractor, mounted on creeping traction 12. These creeping traction elements are pivoted on propelling shaft 13, and their front ends have considerable freedom to rise and fall to conform to unevenness of the ground.

Pivoted to each traction element 12 at 14 is a forwardly projecting arm 15. These arms support and impel a moldboard 16.

On each side of the tractor there is a link 17 pivoted to the rear of the tractor at 18, and a link 19 pivoted to the creeping traction at 20.

These two links are pivoted together at 21, and at this point is also pivoted the elbow of a bell-crank 22.

The front end of each bell-crank supports one side of the moldboard 16 through a link 23.

There are two cylinders 24, each pivoted at 25 on one of the links 17. The piston rod 26 of each cylinder is pivoted at 27 to the short arm of the bell-crank 22.

The rear ends of the two cylinders are connected by a pipe 28, from which a pipe 29 leads to a control-valve 30. The front ends of the two cylinders are similarly connected by a pipe 31, from which a pipe 32 leads to the control-valve 30. How this valve derives power from the pump and tank, hereinafter mentioned, forms no part of my present invention, and hence will not be described herein.

We now come to the inventive features of my invention, on which see primarily Figure 3.

Below my moldboard 16, is a shoe 33, carrying a digging edge 34, both rigidly secured to arms 15. The moldboard proper 16 has each end closed by a plate 35, and is hinged to the shoe 33 in any convenient manner, as by a piano-hinge 36.

Along the back of the top of moldboard proper 16 is an angle beam or bracket 37, for resting engagement with rests 38, on each arm 15.

On the back of the moldboard proper 16 are several vertical reinforcing ribs 39.

On each arm 15 is pivoted an hydraulic cylinder 40, the piston 41 of which is pivoted to one or more ribs 39. This cylinder 40 is preferably double-acting, pressure being provided by two pipes 42 and 43, extending to a valve 44, from which valve a pressure pipe 45 and a return pipe 46 extend to a pump 47, with appropriate connections 48 and 49 to a fluid tank 50.

My invention operates as follows. My digging edge 34 being lowered to the ground by proper manipulation of cylinders 24, the tractor 11 is propelled forwards, until a sizeable amount of dirt has piled up ahead of moldboard 16.

By proper manipulation of valve 44, fluid under pressure is admitted to the front end of cylinders 40 through pipe 43, and fluid is permitted to withdraw from the rear end of cylinders 40 through pipe 42. This retracts piston 41, causing the moldboard 16 to lie back against rest 38. Further forward motion of the tractor 11 fills the moldboard with dirt. The load is prevented from spilling over the back end of the moldboard 16 by guard plate 51 which is mounted on the arms 15 above and back of rests

38 and extends from one arm 15 to the other arm 15.

Cylinders 24 can then be manipulated to raise the moldboard and its load, whereupon the load can be transported.

By reversing the valve 44 and the operation of the cylinders 40, the load can be dumped, the digging edge being lowered by cylinders 24, to spread the load.

Having now described and illustrated one form of my invention, I wish it to be understood that my invention is not to be limited to the specific form or arrangement of parts hereinbefore described except as specified in the appended claims.

I claim:

1. In a bulldozer, for attachment to a tractor, the combination of: a pair of push-arms, pivotally attachable to the tractor; means, supportable by the tractor, for raising and lowering these arms; a transverse shoe, rigidly supported by the arms; a digging edge, rigidly carried by the shoe; a transverse moldboard, concave forwardly, hingedly connected adjacent its lower edge to the shoe; vertical stiffening flanges on the rear face of the moldboard; forwardly projecting plates, closing the ends of the moldboard; a transverse rest bracket along the upper edge of the moldboard; a cooperating transverse rest carried rigidly by the arms; two double-acting cylinders, carried pivotally one by each arm, their pistons being pivotally connected to certain of the vertical stiffening flanges on the moldboard; and means for introducing fluid under pressure to the cylinders, to swing the moldboard selectively to upright dirt-pushing position, or to recumbent dirt-carrying position against the rest.

2. In a bulldozer, for attachment to a tractor, the combination of: a pair of push-arms, pivotally attachable to the tractor; means, supportable by the tractor, for raising and lowering

these arms; transverse digging means, rigidly carried by the arms; a transverse moldboard, hingedly carried by the arms; rest means on the moldboard; cooperating rest means on the arms; forcibly extendible and retractable means, extending between the arms and the moldboard; and means for selectively causing the last-mentioned means to extend or retract, to swing the moldboard selectively to upright dirt-pushing position, or to recumbent dirt-carrying position against the rest.

3. In a bulldozer, for attachment to a tractor, the combination of: a pair of push-arms, pivotally attachable to the tractor; means, supportable by the tractor, for raising and lowering these arms; transverse digging means, rigidly carried by the arms, a transverse moldboard, hingedly carried by the arms; forcibly extendible and retractable means, extending between the arms and the moldboard; and means for selectively causing the last-mentioned means to extend or retract, to swing the moldboard selectively to upright dirt-pushing position, or to recumbent dirt-carrying position.

4. In a bulldozer, for attachment to a tractor, the combination of: push means, attachable to the tractor; means, supportable by the tractor, for raising and lowering the push means; transverse digging means, carried by the push means; a transverse moldboard, separate and distinct from the digging means, and hingedly carried by the push means; and power-operated means to swing the moldboard from recumbent dirt-carrying position to upright dirt-pushing position.

5. A bulldozer, according to claim 2, characterized by the addition of a transverse guard plate, separately carried by the push-arms, and serving as a closure of the upper edge of the moldboard, when the latter is in recumbent dirt-carrying position.

GEORGE W. MORK.