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CONTROL FOR TRAILBUILDERS

Original Filed June 1, 1935

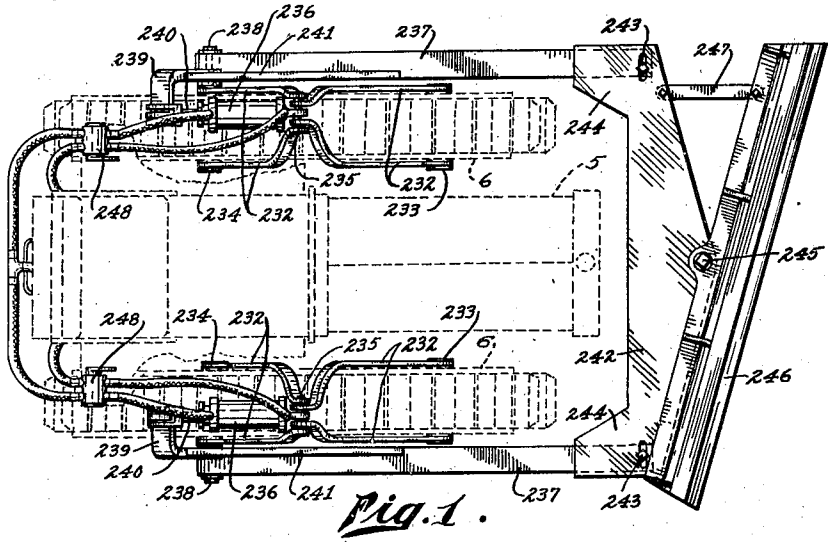


Fig. 1.

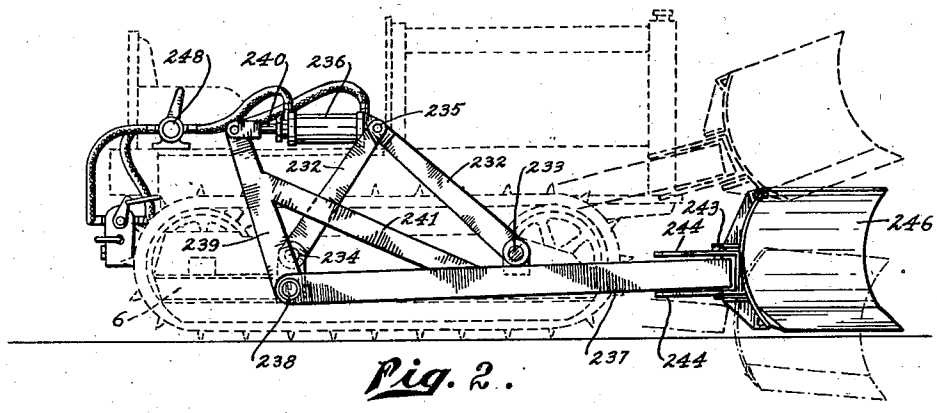


Fig. 2.

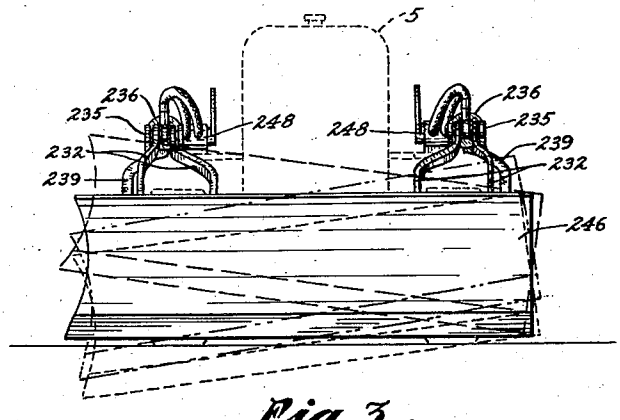


Fig. 3.

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CONTROL FOR TRAIL BUILDERS

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Original application June 1, 1935, Serial No. 24,562. Divided and this application July 24, 1939, Serial No. 286,210

9 Claims. (Cl. 37—144)

This invention relates to trailbuilders and similar tractor operated earth moving apparatus and more particularly pertains to an improved control means which provides for raising, lowering, and tilting the blade or implement of a trailbuilder or like device, and was originally disclosed and claimed in an application Serial No. 24,562, now Patent No. 2,185,179, filed by us on June 1, 1935, and of which the present application is a division.

The primary purpose of the present invention is to provide a trailbuilder, control means of the character described, which is superior to controls as heretofore used, in point of relative simplicity of construction, strength, durability, reliability of performance and greater nicety of operation, and, also by reason of the fact that it includes upstanding yoke-like frames which straddle the upper runs of the tracks and are secured to the inner and outer sides of the track frames at points approximately midway of the ends of the latter; in combination with pusher arms pivoted at their rear ends adjacent the rear ends of the track frames and extending forwardly of the tractor for supporting the blade, upstanding levers free at their upper ends and fixed at their lower ends to said rear ends of the pusher arms and disposed for the most part rearwardly of said yoke-like frames, and separately and simultaneously operable power operated device connected with said free upper ends of said yoke-like frames whereby the levers may be independently and simultaneously operated at will for controlling said blade.

The control means of our invention by reason of the aforesaid constructions and arrangements make possible power operated movements of the blade into ground working position and a power controlled retention of the blade in such positions and also provides for lifting one end of the blade while effecting a power actuated lowering and retention of the other end of the blade in an adjusted position. Moreover such control means does not tend to lift the tracks and interfere with the tractive effort thereof but on the contrary operates to push and hold down the forward end of the tractor due to the location of the yoke-like frames and the levers and the position and action of the power actuated devices which are connected between said frames and levers. Other factors contributing to a fully controlled operation of the blade without interfering with the tractive action of the tracks and which also prevent the vertical movements of the tracks from appreciably lifting or tilting the blade when operating over rough ground are the particular disposition of the yoke-frames which straddle the tracks, the location of the levers at the rear of the pusher arms, the free upper ends of the levers and the particular arrangement of the power actuated devices which provide for independent action of the levers.

With the foregoing and other objects in view, the invention hereof consists in the combination, correlation and construction of parts, elements and features which will be described in the following specification and finally pointed out in the claims hereto appended, it being understood that the apparatus of our invention is subject to modification within the scope of said claims.

In the drawing:

Fig. 1 is a top plan view of a trailbuilder embodying the control means of our invention.

Fig. 2 is a side elevation of the trailbuilder shown in Fig. 1.

Fig. 3 is a front elevation of the apparatus as shown in Figs. 1 and 2.

One form of tractor trailbuilder embodying the control means of our invention is shown in detail in the accompanying drawing and will now be described in detail.

In carrying out our invention each tracklayer frame **6** of the tractor **5** is provided with two pairs of legs **232**, which are arranged so that each pair of the legs **232** straddles the tracklayer. The lower ends of two pairs of the legs **232** are mounted on the tracklayer frames **6** near the forward ends thereof, as shown at **233**, and the lower ends of the other two pairs of legs **232** are mounted on the tracklayer frames **6** near the rear ends of same, as shown at **234**. The upper ends of each two pairs of the legs **232** are connected together by means of a common pivot pin **235** which also is adapted to pivotally carry hydraulic cylinders or jacks **236**. These legs **232** and pins **235** define upstanding yoke-like frames which have their upper ends disposed approximately centrally of the ends of the track frames and their lower ends disposed adjacent the forward and rear ends of the track frames whereby to effect a better and more uniform distribution of stresses which are developed in the operation of the control means of our invention.

A pair of forwardly extending pusher arms **237** are pivotally connected to the tracklayer frames **6**, as shown at **238** adjacent the rear ends of the latter for supporting the blade **236**. The rear ends of the pusher arms **237** are provided with the upwardly extending lever arms **239** which are pivotally connected at the upper ends

to the piston rods 240 of the cylinders 236. Diagonal braces 241 are interposed between the lever arms 239 and pusher arms 237 for reinforcing purposes.

It should be noted that the lower ends of the lever arms 239 are joined to the pusher arms 237 at points located rearwardly of the upstanding yoke-like frames formed by the arms 232 and pins 235. In other words these lever arms are for the most part disposed rearwardly of said upstanding frames respectively and are adapted to be independently operated for independently rocking said levers and likewise moving said pusher arms for raising one end of the blade and lowering the lower. Said power actuated devices are also adapted to be operated simultaneously for raising and lowering said blade as desired. In all operations of the control means the blade is under positive control and is held in position by the power actuated means and adjusted thereby in such a manner that no stresses are set up which tend to lift the tracks or distort or damage the frame, levers, and associated control parts. Moreover the control elements are so positioned and related to one another and track frames and pusher arms that the movement of the tracks when traveling over rough ground will not lift and move the blade out of set position.

The forward ends of pusher arms 237 may carry various forms of earth moving implements; in this instance however, the form illustrated in the drawing is shown as comprising a head 242 flexibly mounted on the pusher arms 237 by means of the pin and slot connection 243 which permits transverse movement of the forward ends of pusher arms 237 relative to the head 242. A substantial clearance between the upper and lower ears 244 of the head 242 and the ends of the pusher arms 237 completes the flexibility of the connection by allowing play in the vertical plane between the ends of pusher arms 237 and the ears 244 on head 242. This flexibility is necessary for transverse tilting of head 242 by the independent actuation of pusher arm 237.

The front of head 242 is of triangular shape with the apex projecting forwardly for carrying pivotally mounted thereon, as at 245, the reversible blade 246. Suitable links 247 are used for holding the blade 246 in its set positions.

Any suitable hydraulic system may be used for actuating the cylinders 236; in this instance however, a pair of valves 248 are shown for individual control of each cylinder 236.

We claim:

1. A trailbuilder in combination with a tractor, including a pair of forwardly extending pusher arms pivoted to the tracklayer frames of the tractor, a blade on the forward ends of said arms, upwardly extending lever arms at the rear ends of said pusher arms, upstanding frames straddling the tracks of the tractor and secured to opposite sides of said tracklayer frames at points forwardly of said lever arms, hydraulic cylinders mounted on the upper ends of said upstanding frames and extending rearwardly therefrom, and piston rods associated with said cylinders and connected with said lever arms, said lever arms being unconnected with parts other than said pusher arms and piston rods and thereby free for independent operation, and means for independently operating said hydraulic cylinders to extend and retract said piston rods.

2. A tractor operated trailbuilder including pusher arms pivoted at their rear ends to the track frames of the tractor adjacent the rear ends of said track frames, a blade carried at the forward ends of said arms, lever arms fixed at their lower ends to the rear ends of said pusher arms and having free upper ends whereby each lever may be operated independently of the other, upstanding yoke-like frames straddling the track of the tractor and fixed to the track frames, said upstanding frames having their upper ends located at points forwardly of the upper ends of said lever arms, and power operated devices connected with said upper ends of said upstanding frames and with the upper ends of said lever arms and being independently and simultaneously operable for rocking said lever arms and raising or lowering said pusher arms to determine the position of said blade.

3. A tractor operated trailbuilder including pusher arms pivoted at their rear ends adjacent the rear ends of the track frames of the tractor, a blade carried between the forward ends of said arms, lever arms fixed at their lower ends adjacent the rear ends of said pusher arms and having free upper ends whereby each lever may be operated independently, upstanding yoke-like frames straddling the track of the tractor and fixed to the track frames, said upstanding frames having their upper ends located at points approximately midway of the ends of the track frames and forwardly of the upper ends of said lever arms, and power operated devices connected with said upper ends of said upstanding frames and with the upper ends of said lever arms and being independently and simultaneouly operable for rocking said lever arms and raising or lowering said pusher arms, each of said upstanding frames having forwardly and rearwardly extending portions secured respectively adjacent the forward and rear ends and on opposite sides of said track frames.

4. In combination, a track laying tractor, pusher arms pivoted on the track frames of the tractor and extending forwardly therefrom, a blade supported by and between the forward ends of said arms, upstanding lever arms fixed at their lower ends to said pusher arms and being free at their upper ends, upstanding members mounted on the track frames and having free upper ends disposed in forwardly spaced relation to said lever arms, and power actuated devices flexibly connected with and extending between the free upper ends of said lever arms and upstanding members respectively and adapted to be operated for independently and simultaneously rocking said lever arms.

5. In combination, a track laying tractor, pusher arms pivoted on the track frames of the tractor and extending forwardly therefrom, a blade supported by and between the forward ends of said arms, upstanding lever arms fixed at their lower ends to said pusher arms and being free at their upper ends, upstanding frames mounted on the track frames and having free upper ends disposed in forwardly spaced relation to said lever arms, and power actuated devices flexibly connected with and extending between the free upper ends of said lever arms and upstanding frames respectively and adapted to be operated for independently and simultaneously rocking said lever arms, each of said upstanding frames having members disposed on opposite sides of the track frame to which it is secured and having its free upper end located substantially midway between and over said opposite sides.

6. In combination, a tractor, pusher arms independently pivoted on the track frames of the tractor, an earth moving blade carried by said arms, lever arms fixed to and operable for relatively moving said pusher arms, and power actuated devices connecting said lever arms with said tractor and operable for relatively moving said lever arms and pusher arms so as to tilt said blade and maintain it in tilted position.

7. In combination, a tractor, pusher arms independently connected with rigid parts of the tractor for movement relative to one another, an earth moving blade, means for flexibly connecting said blade with said arms so that the arms may be relatively moved to tilt the blade without distorting of the blade or arms, lever arms rigidly connected to and operable for relatively moving said pusher arms and power actuated devices connected with said lever arms and operable for relatively moving said pusher arms so as to tilt the blade and maintain it in tilted position.

8. In combination, a tractor, pusher arms connected with the outer sides of the track frames of the tractor for movement relative to one another, an earth moving blade connected with said arms so that it will tilt when the arms are relatively moved, lever arms rigidly connected to and operable for relatively moving said pusher arms, power actuated devices connected with said tractor and said lever arms and including hydraulic cylinders and pistons disposed substantially at right angles to said lever arms, and means for independently operating said power actuated devices.

9. In an earth moving device, the combination with a tractor, of pusher arms pivotally connected to the tractor and extending forwardly thereof, a blade carried by said pusher arms in front of the tractor for engaging and moving material upon forward movement of the tractor, and means for raising said blade, such means comprising lever arms connected with the pusher arms adjacent the rear ends of the latter, and which lever arms extend upwardly from the pusher arms so that a backward push on said lever arms will rotate said pusher arms about their pivots to raise the blade, and hydraulic jacks pivotally mounted on the tractor and connected with the upper ends of the lever arms and operable to exert pressure thereon to effect rotation of the pusher arms about their pivots and thus raise the blade.

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