Aug. 31, 1954 M. W. DICKINSON 2,687,586

ADJUSTABLE BULLDOZER BLADE

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Fig. 1

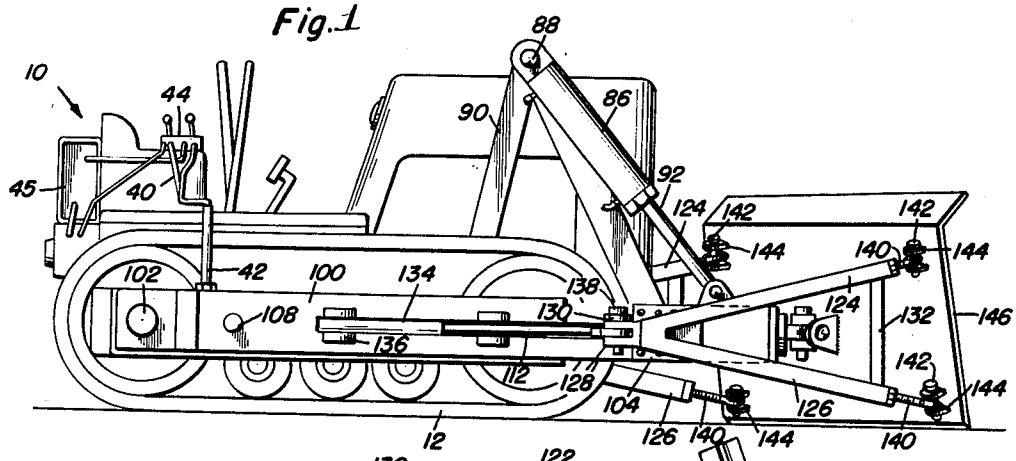


Fig. 2.

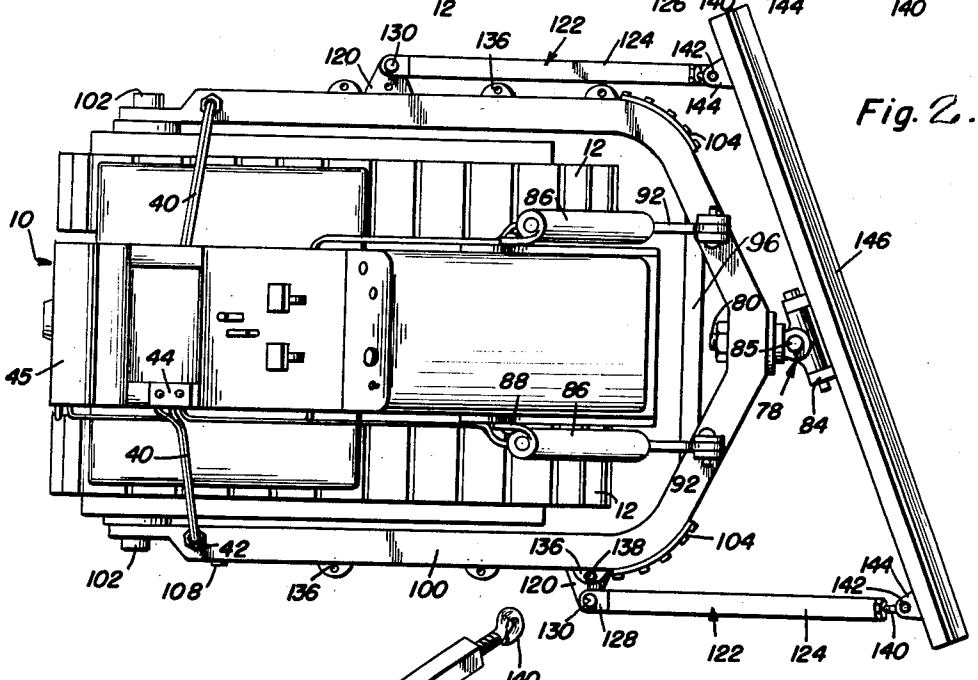
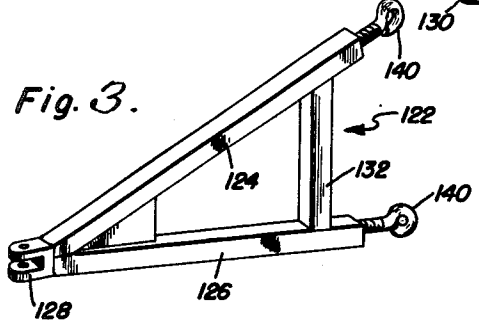


Fig. 3.



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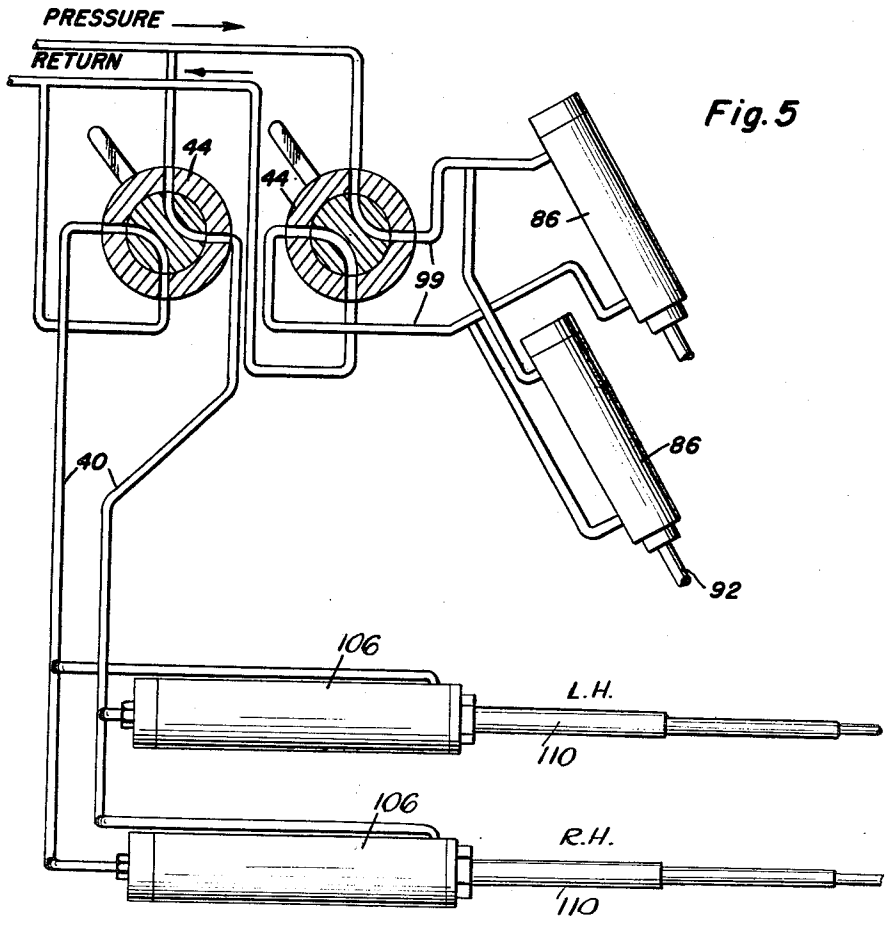


Fig. 5

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Filed June 28, 1950 3 Sheets-Sheet 3

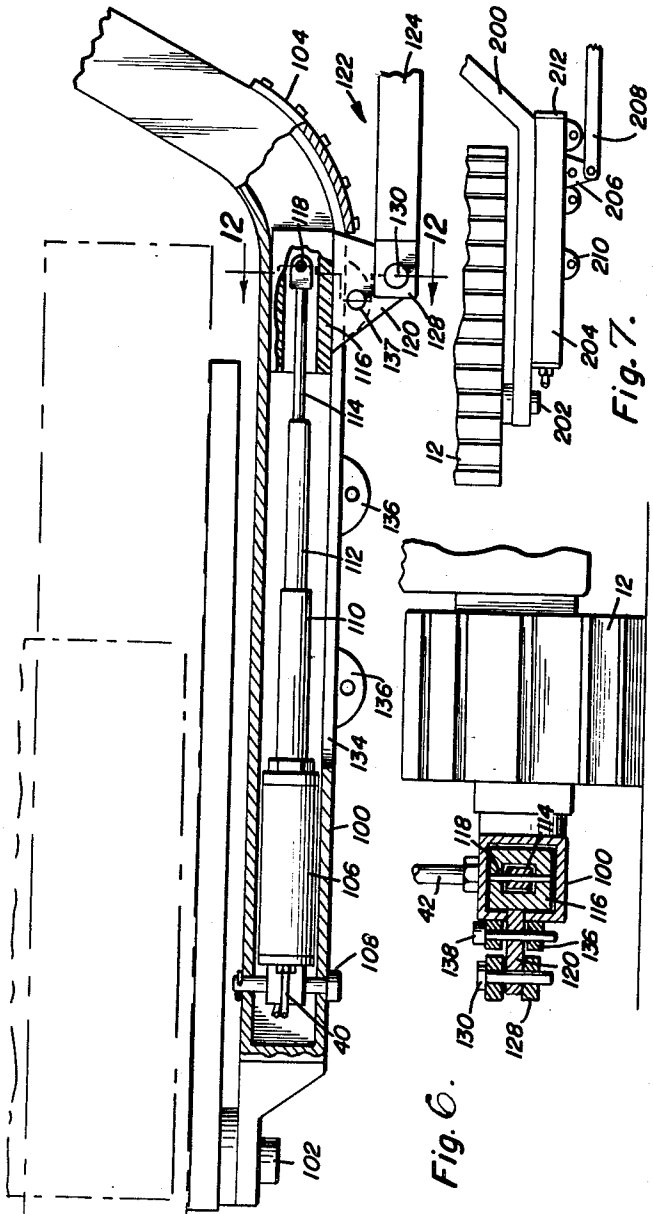


Fig. 7.

Fig. 6.

Fig. 4.

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UNITED STATES PATENT OFFICE

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ADJUSTABLE BULLDOZER BLADE

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Application June 28, 1950, Serial No. 170,855

2 Claims. (Cl. 37—144)

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This invention relates generally to bulldozers and more particularly to means for mounting and shifting the blade of a bulldozer.

A primary object of this invention is to provide means whereby the blade of a bulldozer can be quickly and easily altered as to the angle thereof relative to the bulldozer and as to the elevation of the blade, it being understood that the blade will ordinarily be locked in position after such adjustment. The adjustment can be made in a few seconds and the locking is also easily accomplished.

When the blade is not locked, it is possible with this improved construction to lower either end of the blade sufficiently to cause a corner of the blade to dig in to a greater degree, thus facilitating grading operations.

Another object of this invention is to provide means for mounting and controlling the blade which makes it very improbable that the bulldozer will ever become stuck.

Another object of this invention is to provide a construction allowing the operator to reverse the blade setting or otherwise change the blade setting so that the operator can work on either side of the bulldozer without stopping and losing time in changing the blade setting. It will be understood that the blade is locked in position only for very rough work, such as digging rocks.

A last object to be mentioned specifically is to provide a bulldozer construction of the character mentioned above, which will be relatively inexpensive and practicable to manufacture, which will be safe as well as economical and convenient to operate, and which will give generally efficient and durable service.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in detail in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is a side elevational view of this invention;

Figure 2 is a top plan view of this invention indicated in Figure 1;

Figure 3 is a view, in perspective, of one of the links used to connect the slide with the blade;

Figure 4 is a view of one arm of the modified arched frame shown in Figures 1 and 2, a portion thereof being broken away and the underlying portion being shown in horizontal section and in plan, and the view being enlarged to amplify the disclosure of this portion of the invention;

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Figure 5 is a diagrammatic view of the hydraulic system showing how the various pistons are simultaneously operated to cause reverse motion in opposite portions of the blade;

Figure 6 is a vertical sectional view taken substantially upon the line 12—12 in Figure 4; and

Figure 7 is a view, on reduced scale, of a modified form of this invention, wherein a hollow arm with a cylinder therein is rigidly mounted upon the sides of an arched frame conventionally provided on a bulldozer, this figure being fragmentary and showing all the parts in plan.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the different views in the drawings.

Referring now to the drawings in detail, this improved bulldozer will include a tractor preferably of the crawler type as generally indicated by the numeral 10, the treads being indicated at 12.

An arched frame 100 is directly secured to rear portions of the frame of the caterpillar tractor by means of large headed members 102. The forward end of each arm of this arched frame 100 is provided with an aperture which is covered with a closure plate 104, to allow insertion of the cylinders 106. These cylinders are operatively connected by flexible tubes 40 extending through tube shields 42 for connection to the valves 44 in a valve assembly illustrated in Figure 5 and are secured pivotally to rear end portions of the arms of the arched frame by pivot pins 108. The cylinders may have single or telescoping pistons, the latter type being indicated at 110, 112 and 114, the last-mentioned element being considered the piston rod, and this piston rod is, in each case, pivotally connected on a slide 116, by means of a wrist pin 118, as best illustrated in Figure 4. Each slide 116 has an extending portion 120 to which a link 122 is secured. This link 122 is best illustrated in Figure 3 and is comprised of an upper bar 124, a lower bar 126 inclined toward and connected to a swivel joint 128 which coacts with a pivot pin 130 to connect the link 122 to the extending portion 120 of the slide. A brace 132 extends between the arms 124 and 126. An important element in this invention is the slot 134 extending longitudinally of each of the arms of the arched frame 100, this slot allowing the extend-

ing portion 120 to slide along the arm of the arched frame 100 in response to actuation of the cylinders 106. A plurality of ears 136 are provided on the sides of the slots 134 and the extending portion 120 is provided with an aperture 137 so that a pin 138 can be dropped through the ears 136 and the aperture 137 to lock the slide after adjustment, for rough work.

Eye bolts 140 are screwed into forward end portions of the arms 124 and 126 and these eye bolts are connected by means of pins 142 with ears 144 on the rear side of a blade indicated at 146.

The forward end of the arched frame 100 with the blade 146 can be raised or lowered by means of hydraulic cylinders 86 pivotally secured as indicated at 88 upon the frame standards 90 or any other suitable portion of the caterpillar tractor 10. The cylinders are arranged in opposing relation on opposite sides of the tractor 10 and the pistons 92 are terminally and pivotally secured to the ears 94. A reinforcing brace 96 is used to strengthen the forward end portion of the arched frame. By selective use of these cylinders 86, either end of the blade can be lowered below the other end and the blade can be lifted and lowered with or without this tilting action, in order to facilitate grading operations. The connecting means for the arched frame allows limited pivotal action of this arched frame, due to the loose fitted pins 102, this limited tilting being sufficient to cause either end of the blade to dig in the earth considerably deeper than the opposite end when this is desired.

In the modified form of this invention, indicated in Figure 7, conventional arched frames such as that indicated at 200 may be used, these arched frames being connected according to conventional practice as indicated at 202. On the side of such an arched frame 200 a hollow elongated arm 204 is welded or otherwise rigidly secured, this arm being slotted similarly to the arms of the arched frame 100 and a slide having an extending portion 206 will be used therewith. The link means 208 will correspond generally with the link 122 and apertured ears 210 will be provided on the sides of the arm 204. The slide used in this embodiment will be inserted from the front end of the arm and a flat plate 212 will replace the curved plate 104.

The operation of this invention will be clearly understood from a consideration of the foregoing description of the mechanical details thereof, taken with the above recited objects and the drawings. Further description would appear unnecessary. Variation in form may be made within the scope of this invention as defined in the claims.

Having described the invention, what is claimed as new is:

1. In a bulldozer, a U-shaped arched frame having parallel hollow arms, hydraulic cylinders operatively mounted in said arms and having pistons, slides longitudinally slidably mounted in said arms and connected to said pistons, a bulldozer blade centrally pivoted on said arched frame, links operatively connecting laterally opposed portions of the blade to said slides, movement of said pistons serving to angularly adjust said blade, said arms having longitudinal slots and said slides having portions extending through said slots and connected to said links, lugs on said arms adjacent said slots, and said extending portions of said slides and said lugs having pin receiving apertures and pins inserted through said apertures in the extending portions and selectively through said apertures in certain ones of the lugs to lock the slides after adjustment of the blade.

2. In a bulldozer, a U-shaped arched frame having parallel hollow arms, hydraulic cylinders operatively mounted in said arms and having pistons, slides longitudinally slidably mounted in said arms and connected to said pistons, a bulldozer blade centrally pivoted on said arched frame, links operatively connecting laterally opposed portions of the blade to said slides, movement of said pistons serving to angularly adjust said blade, said arms having longitudinal slots and said slides having portions extending through said slots and connected to said links, lugs on said arms adjacent said slots, means selectively interconnecting said extending portions of said slides and certain ones of said lugs to lock the slides after adjustment of the blade.

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