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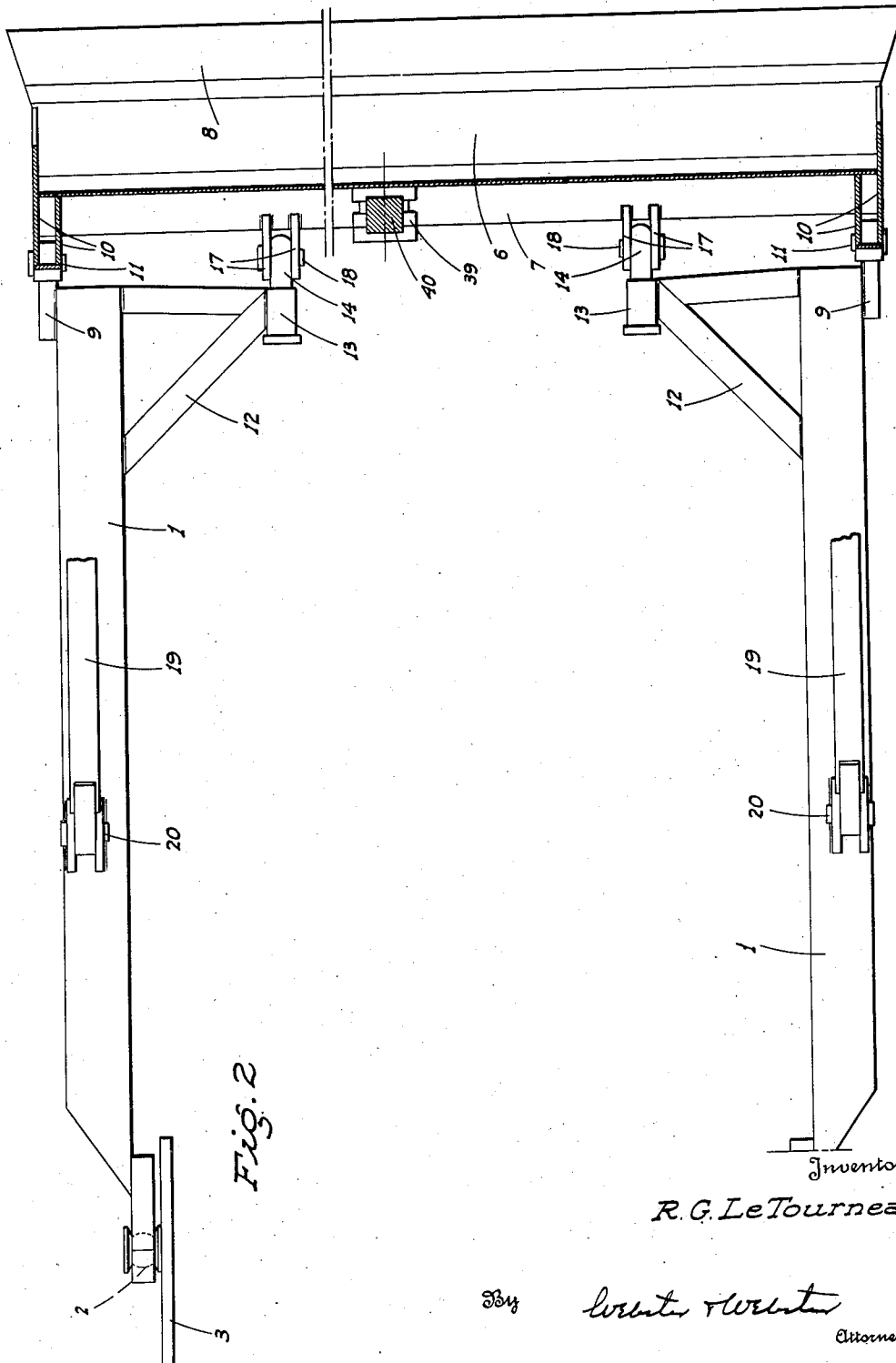
R. G. LE TOURNEAU

2,452,774

ADJUSTABLE PUSH GRADER MOUNT

Filed Oct. 30, 1944

3 Sheets-Sheet 2



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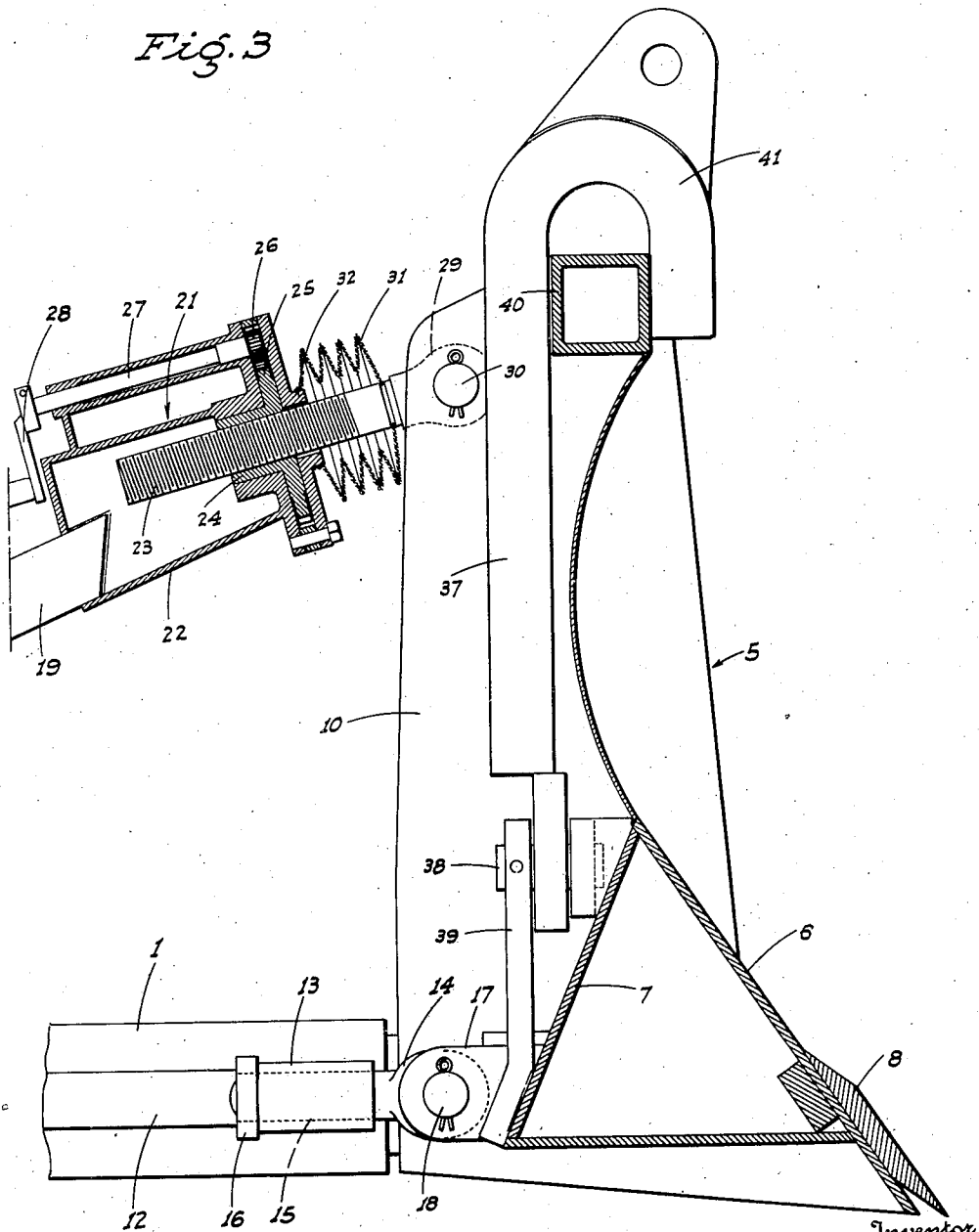
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Fig. 3



UNITED STATES PATENT OFFICE

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ADJUSTABLE PUSH GRADER MOUNT

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3 Claims. (Cl. 37-144)

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This invention relates in general to a tractor mounted earth working implement of the type known as a push grader or bulldozer, which includes, a generally, a transverse grader blade unit adapted to be disposed ahead of the tractor and supported therefrom by a mount which includes transversely spaced push beams.

In particular this invention is directed to, and it is an object to provide, a novel push grader mount which supports the blade unit for manually controlled adjustment to accomplish tilting of said blade unit, both transversely and lengthwise of the direction of travel, selectively.

Another object of this invention is to provide a push grader blade unit mount, as above, which includes a manually controlled, a ever-ready, self-locking tilting mechanism between the blade unit and each push beam, said tilting mechanisms being arranged so that they may be actuated to adjust the tilt of the blade unit either longitudinally or transversely of the direction of travel, such adjustment being accomplished quickly, accurately and without the use of tools.

A further object of this invention is to provide a push grader blade unit mount which comprises a pair of transversely spaced push beams adapted to connect adjacent their rear ends on the tractor, the forward ends of the push beams being transversely pivotally connected to the blade unit, a forwardly extending, upwardly inclined compression bar transversely pivoted at its lower end on each push beam some distance to the rear of the forward end thereof, and a manually controlled, ever-ready, self-locking tilting mechanism connected between the upper and forward end of each compression bar and the blade unit above the corresponding push beam.

These objects I accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicates corresponding parts in the several views:

Figure 1 is a side elevation of the improved push grader blade unit mount.

Figure 2 is a sectional plan view of said mount substantially on line 2-2 of Fig. 1.

Figure 3 is an enlarged fragmentary sectional elevation, showing the forward portion of the mount as connected with the blade unit.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 indicates transversely spaced, longitudinally extending push beams which are connected at

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their rear ends by means of ball and socket type universal joints 2 with attachment plates 3 adapted to be secured to the outside of the corresponding track frame of the tractor.

The push beams 1 extend forwardly to a termination ahead of the tractor, which is indicated generally at 4, and a push grader blade unit 5 extends transversely ahead of the push beams.

The blade unit 5 includes, adjacent the bottom thereof, downwardly diverging front and rear, transversely extending plates 6 and 7, respectively; the front plate 6 carrying the earth digging or working blade 8.

The push beams 1 are fitted at their forward ends with ears 9, each of which project between a pair of vertical, transversely spaced attachment plates 10 formed rigidly with the push grader blade unit 5 at the back; said ears being transversely pivotally supported between said plates on cross pin 11.

Rigid, laterally inwardly projecting braces 12 are fixed in connection with the forward end portions of the push beams 1; said braces having sleeves 13 on their inner ends, with the axes of said sleeves extending substantially, horizontal and lengthwise of the direction of travel. Eyes 14 project forwardly from the sleeves 13, said eyes having connecting shanks 15 which extend rearwardly through said sleeves. Heads 16 are formed on the rear ends of said shanks and abut against the adjacent ends of the sleeves securing the shanks therein. The eyes 14 are each disposed between a rigid clevis 17 which is fixed in connection with and projects rearwardly from the rear plate 7 of the blade unit 5; said eyes being retained in said clevises by cross pins 18.

A forwardly and upwardly inclined heavy-duty compression bar 19 is transversely pivotally mounted at its rear and lower end, as at 20, to each push beam 1 some distance rearwardly of the forward end of the latter. A blade unit tilting mechanism, indicated generally at 21, is connected between the forward and upper end of each compression bar 19 and the blade unit 5 at the back and above the corresponding push beam. Each blade unit tilting mechanism 21 comprises the following arrangement:

A generally forwardly projecting housing 22 is fixed in connection with the upper and forward end of each compression bar 19 and a threaded spindle 23 extends into said housing from the forward end of the latter. Within the housing 22 the spindle 23 is threaded through an elongated hub 24 of a gear 25; the hub 24 being

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rotatably but axially immovably supported in said housing. The gear 25 meshes with a pinion 26 likewise journaled in the housing, and which pinion is fixed on one end of a pinion shaft 27, which extends rearwardly above the main portion of the housing 22 to a termination adjacent the rear end of the latter. At its rear end the shaft 27 is fitted with a hand crank 28. The gear 25, pinion 26, and shaft 27 are all enclosed within extensions of the housing 22. It will be seen that with rotation of the crank 28 in one direction or the other, the corresponding spindle 23 will either be advanced or retracted.

The assembly of each compression bar 19 and corresponding tilting mechanism 21 forms what may be termed an extensible compression unit, and as such compression units are connected to the rear of the blade unit at a relatively high point and to the push beams at a rearward point, accidental damage by engagement with foreign material is reduced to a minimum.

Ahead of the housing 22 the spindle 23 is formed with an eye 29 which engages between the upper end portions of the adjacent pair of attachment plates 10, and each of said eyes is pivotally supported between said plates by a cross pin 30. To prevent access of dirt or moisture to the exposed threaded portion of the spindle 23 an accordion protector sleeve 31 is secured between the spindle adjacent the eye 30 and a neck 32 on the housing at its forward end.

The grader blade unit 5 is vertically adjustably suspended from a front end tractor supported frame, shown in part at 33, by means of a depending, power actuated cable system shown in part at 34, which includes a lower sheave 35. The sheave 35 is pivotally connected on a transverse axis, as at 36, with the upper end portion of a blade unit lifting link 37 disposed centrally of the ends of the blade unit, and which link is constructed and mounted as follows:

The link 37 is a heavy-duty bar disposed in upstanding relation to the rear of the blade unit 5; said bar being pivotally mounted at its lower end, for lateral swinging movement, on a trunnion 38 which projects rearwardly from said blade unit a considerable distance below the upper edge of the latter. The trunnion 38 is disposed much closer to the bottom of the blade unit than the top, and for the reason which will hereinafter appear. The trunnion is supported, adjacent its outer end, by a heavy-duty bracket 39 which upstands from the rear plate 7.

The blade unit 5 includes, at the top thereof, a transverse beam 40, and at its upper end the link 37 is formed with a downwardly opening gooseneck 41 which straddles beam 40 in guided but slidable relation thereto, as clearly shown in Fig. 3.

When the push grader is in use its working depth is controlled by the cable system 34, which system is substantially conventional.

To adjust the tilt of the blade unit 5 lengthwise of the tractor the operator manually actuates both the cranks 28 in the same direction, and in the direction which produces the desired longitudinal tilting movement of said blade unit. As is evident this can be accomplished by the operator of the tractor with a minimum of effort, always quickly and accurately. This is an extreme advantage over previous types of tilting mechanisms which required the use of tools and the unloosening and retightening of adjustment nuts or the like.

If the operator desires to tilt the blade unit 5

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transversely of the direction of travel, the cranks 28 are operated to cause a greater projection of one spindle 23 than the projection of the spindle of the other tilting mechanism. This differential projection, acting through the compression bars 19 and push beams 1, causes the blade unit 5 to raise, or lower, at one end relative to the other, producing the desired transverse tilt of the blade unit.

The relatively laterally swingable link 37, pivoted low on the blade unit, permits said blade unit to tilt transversely without materially laterally offsetting any part of the cable system 34, which prevents cable wear which would otherwise result.

It should be noted that the tilting mechanisms 21 are so constructed that, in addition to being ever-ready, they are self-locking, i. e., when the operator completes the manipulation of the cranks 28, the blade unit is automatically fixedly retained in its adjusted position, for the reason that the spindle 23 cannot then move lengthwise or cause any rotation of the hubs 24, through which said spindles are threaded.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. In a push grader, a pair of transversely spaced push beams, a transverse grader blade unit ahead of and pivoted to said push beams for tilting movement lengthwise of the direction of travel, means between the blade unit and push beams to control transverse tilting of said unit, and a blade unit lifting link disposed centrally of the ends of the blade unit and pivoted thereto at the back and adjacent its lower edge for transverse swinging movement, said link extending upward to a point above the blade unit and being adapted at its upper end for connection with a lifting cable; the blade unit including a top beam, and the link at its upper end having a downwardly opening gooseneck straddling said beam in link guiding relation.

2. An adjustable push grader mount comprising a pair of transversely spaced, longitudinally extending push beams, means adapted to couple the push beams at their rear ends to the tractor on opposite sides thereof, said means coupling the push beams to the tractor for limited lateral rocking motion, a push grader blade disposed transversely ahead of the push beams, means pivotally connecting the blade adjacent its lower edge to the forward ends of the push beams, a compression bar unit pivoted to each push beam intermediate its ends and thence extending at a forward and upward incline, means pivotally connecting the blade adjacent its upper edge to the forward ends of the compression bar units, said compression bar units lying in the same vertical planes as the corresponding push beams and being free between the pivotal connections with said push beams and the blade, at least one of the compression bar units being selectively extensible so that differential lengthening thereof relative to the other compression bar unit

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causes tilting of the blade transversely of the direction of travel; there being an inwardly projecting rigid horizontal brace adjacent the outer end of each push beam, the outer end of each brace being pivotally connected to the blade adjacent its bottom edge.

3. An adjustable push grader mount comprising a pair of transversely spaced, longitudinally extending push beams, means adapted to couple the push beams at their rear ends to the tractor on opposite sides thereof, said means coupling the push beams to the tractor for limited lateral rocking motion, a push grader blade disposed transversely ahead of the push beams, means pivotally connecting the blade adjacent its lower edge to the forward ends of the push beams, a compression bar unit pivoted to each push beam intermediate its ends and thence extending at a forward and upward incline, means pivotally connecting the blade adjacent its upper edge to the forward ends of the compression bar units, said compression bar units lying in the same vertical planes as the corresponding push beams and being free between the pivotal connections with said push beams and the blade, at least one

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of the compression bar units being selectively extensible so that differential lengthening thereof relative to the other compression bar unit causes tilting of the blade transversely of the direction of travel; there being an inwardly projecting rigid horizontal brace adjacent the outer end of each push beam, a longitudinal sleeve on the outer end of each brace, a shank in each sleeve, and an eye on the forward end of each shank, said eyes being pivotally connected to the blade adjacent its lower edge.

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