C. W. ROBINSON.

CONTROL MEANS FOR EARTHWORKING TOOLS.

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1,319,489. Patented Oct. 21, 1919.

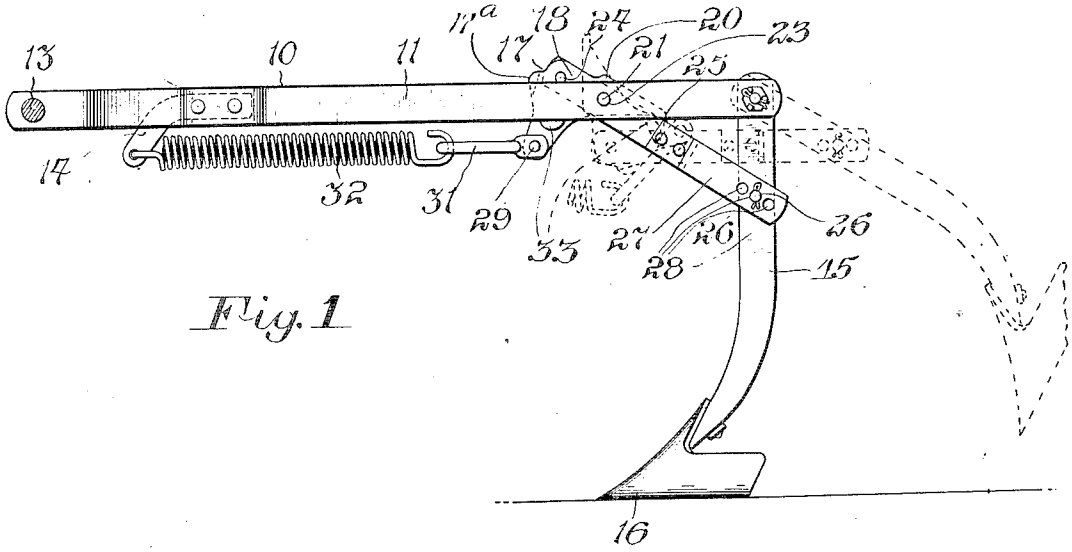


Fig. 1

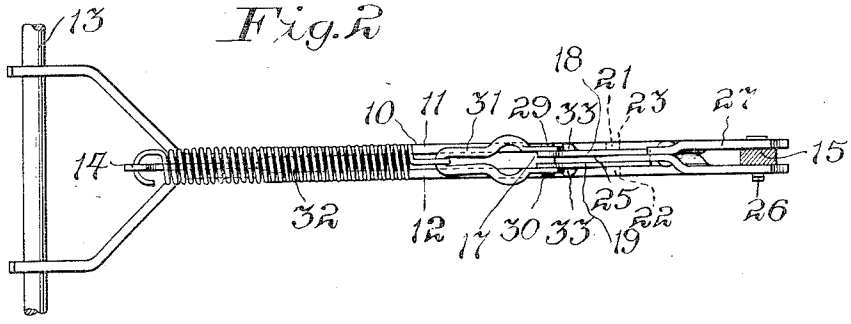


Fig. 2

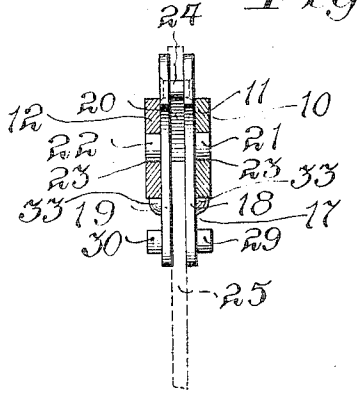


Fig. 4

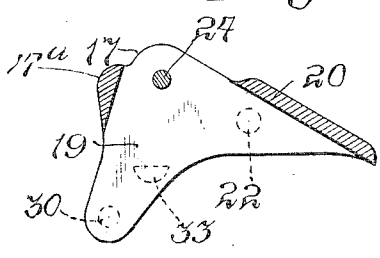


Fig. 3

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CONTROL MEANS FOR EARTHWORKING-TOOLS.

1,319,489. Specification of Letters Patent. Patented Oct. 21, 1919.

Application filed June 4, 1917. Serial No. 172,648.

To all whom it may concern:

Be it known that I, CHARLES W. ROBINSON, a citizen of the United States, residing at Hamilton, in the county of Wentworth, Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Control Means for Earth-working-Tools, of which the following is a full, clear, and exact specification.

This invention relates to control means for earth-working tools.

One of the objects of my invention is to simplify and improve control means for earth-working tools.

Another object is to yieldingly lock an earth-working tool in one position and automatically return the tool to such position when it has been withdrawn therefrom by contacting with an obstruction.

Another object of my invention is to provide a tool supporting and control arrangement adapted to meet all the requirements for successful commercial operation.

These and other objects are accomplished by providing, in combination, a draw bar, a tool standard pivotally connected thereto, means for locking the standard in one position, and force-exerting means, the leverage of which increases on the standard as the latter is moved from said position.

The invention is illustrated on the accompanying sheet of drawings, in which—

Figure 1 is a side elevation of a draw bar and earth-working tool equipment embodying my invention;

Fig. 2 is a bottom plan view of the same, the earth-working tool and a part of its standard being broken away;

Fig. 3 is a detail sectional view of one of the elements in the combination; and

Fig. 4 is a fragmentary front elevation, the parts being in section, of the member shown in Fig. 3 connected to associated parts.

The various novel features of my invention will be apparent from the following description and drawings and will be particularly pointed out in the appended claims.

My invention is illustrated in connection with a tillage implement, such, for example, as a cultivator, which has a plurality of suitably supported ground-working tools, the tools preferably being supported by suitable draw or drag bars. In the drawings I have shown but one of these draw bars 10 including two side members 11 and 12 which are substantially parallel throughout their lengths except at their front portions, which are spread apart and connected to a rod 13. Intermediate the bars and secured thereto adjacent their front expanded portions is a depending member 14, one function of which is to serve as a connecting and supporting means between the side members 11 and 12. Pivotally mounted between the rear ends of the side members 11 and 12 of the draw bar is a standard 15, at the lower forwardly curved portion of which is secured a ground-working tool 16. Also pivotally secured to the draw bar between its side members 11 and 12 is a substantially triangular member 17 having oppositely arranged side portions 18 and 19 connected by an integrally formed, laterally extending back or web portion 20. Extending outwardly from the outer sides of these side portions 18 and 19 are trunnions 21 and 22 which are received by oppositely arranged apertures 23 in the draw bar members 11 and 12. It is seen, therefore, that the member 17 is pivotally mounted intermediate the standard 15 and depending member 14 in the draw bar on its trunnions 21 and 22. Pivotally connected to a rivet or stud 24 connecting the oppositely arranged side portions 18 and 19, is one end of a link 25, the other end of which is pivotally connected to the standard 15 by a pin 26 which extends through the standard, link 25 and a strap 27 which is secured to the lower part of the link to form a forked portion which straddles the standard 15. The link 25 and its strap 27 are provided with a plurality of openings 28, by means of which the normal position of the tool-carrying standard 15 may be adjusted. The side portions 18 and 19 of the member 17 are also provided with projections 29 and 30 which are received by apertured ends of a member 31, to the free end of which is connected one end of a spring or force-exerting member 32, the other end of the spring being connected to the depending member 14 which is secured to the draw bar 10.

As shown in full lines in Fig. 1, the tool standard is in its normal position, it being impossible for the tool standard to be moved forwardly therefrom for a given adjustment of the pin 26 because of the fact that the

upper edge of the front portion of the link 25 is in engagement with the back 20 of the member 17, and lateral projections 33 (only one of which is shown) engage the lower edges of the draw bar side members 11 and 12. It is to be noted also that the axes of the stud 24, of the trunnions 21 and 22 and pin 26 lie substantially in the same straight line. In other words, as shown in full lines in Fig. 1, the tool-carrying standard 15 is in a locked position. More strictly speaking, the tool carrying standard 15 is yieldingly held in locked position by the spring 32. From an inspection of Fig. 1 it is apparent that if, during a progressive movement of the cultivator, the earth-working tool 16 passes into engagement with an obstruction, such as a large rock or unyielding root, the tool carrying standard 15 will swing rearwardly due to the pivotal connection of the trunnions 21 and 22, this rearward movement being in opposition to the action of the spring 32. It is further apparent that as the tool-carrying standard moves more and more to the rear and the angle between draw bar 10 and standard 15 increases, the effective lever arm through which the spring 32 acts is increased due to the action of the member 31 which no longer is pulled in line with the spring 32 but is forced downward by the stop 17ª on the member 17 and becomes a lever, as shown in dotted lines, thereby causing the spring 32 to move farther from the center 21 about which it acts. The tension in the spring also is increased in view of the fact that the spring is stretched during a rearward movement of the standard 15. With this arrangement it is seen that as soon as the obstruction is passed, the spring 32 with its increased stored energy and with an increased lever arm, causes the tool-carrying standard to return to its normal locked position with a snap action. In this manner obstructions may be encountered without injury being done to the tools or parts associated therewith, and at the same time the arrangement in question has all of the advantages of a stiff tooth construction.

It is evident that there may be various modifications of the precise arrangement herein shown and described, and it is my intention to cover all such modifications which do not involve a departure from the spirit and scope of my invention as set forth in the following claims.

What I claim as new is:

1. In combination, a draw bar, a tool standard pivoted thereto, a member also pivoted to said bar, a link connecting said standard and member, and a spring acting upon said member to return the tool standard to a given position after it has been withdrawn therefrom said spring acting through a link which swings so as to become a lever when the member has passed a predetermined point.

2. In combination, a draw bar, a tool standard pivoted thereto, a member also pivoted to said bar, a link connecting said standard and member on a line a little below the pivotal connection between said member and draw bar, and a spring for yieldingly holding the parts in such position, the lever arm of said spring increasing with change in position of said parts at a more rapid rate than the pull on the standard.

3. In combination, a draw bar, a tool standard pivoted thereto, a triangular member pivoted to said draw bar at one of its corners, a link connecting said tool standard and another corner of said triangular member, and force-exerting means connected to the other corner of said triangular member in such a way that the lever arm of the spring increases faster than the rotation of the triangular member.

4. In combination, a draw bar, a tool standard pivoted thereto, a member having oppositely arranged side portions and a back also pivotally connected to said draw bar, a link connecting said tool standard and member and normally engaging the back portion of said member to prevent a movement of said standard in one direction, and means for yieldingly holding said standard against movement in the other direction.

5. In combination, a draw bar having side members, a tool standard pivotally connected therebetween, a member having side portions with trunnions pivotally connected to said side members between the same, a link connecting said tool support and said member, stop means on said member for limiting movement of the back of said standard in one direction, and yielding means for opposing movement of the standard in the other direction.

6. In combination, a draw bar having side members, a tool standard pivotally connected therebetween, a member having side portions with trunnions pivotally connected to said side members between the same, a link connecting said tool support and said member, stop means on said member for limiting movement of the back of said standard in one direction, and a spring connected to said member for opposing movement of said standard in an opposite direction.

7. In combination, a draw bar having side members, a tool standard pivoted therebetween, a member having side portions also pivoted to said draw bar, a connection between said tool standard and member, means for limiting the movement of said tool standard in one direction, a link connected to said member which acts as a lever when said standard is swung a predetermined amount from its normal position, and a

spring connected to said draw bar and to said link for moving the standard back into its limiting position when withdrawn therefrom.

8. In combination, a draw bar, a tool standard pivoted thereto, a member pivoted to the draw bar, a link pivoted to said member and to the tool standard, a spring beneath the draw bar and attached thereto and operatively attached to the member to pull said member back to normal position if withdrawn therefrom.

In testimony whereof I affix my signature.

CHARLES W. ROBINSON.