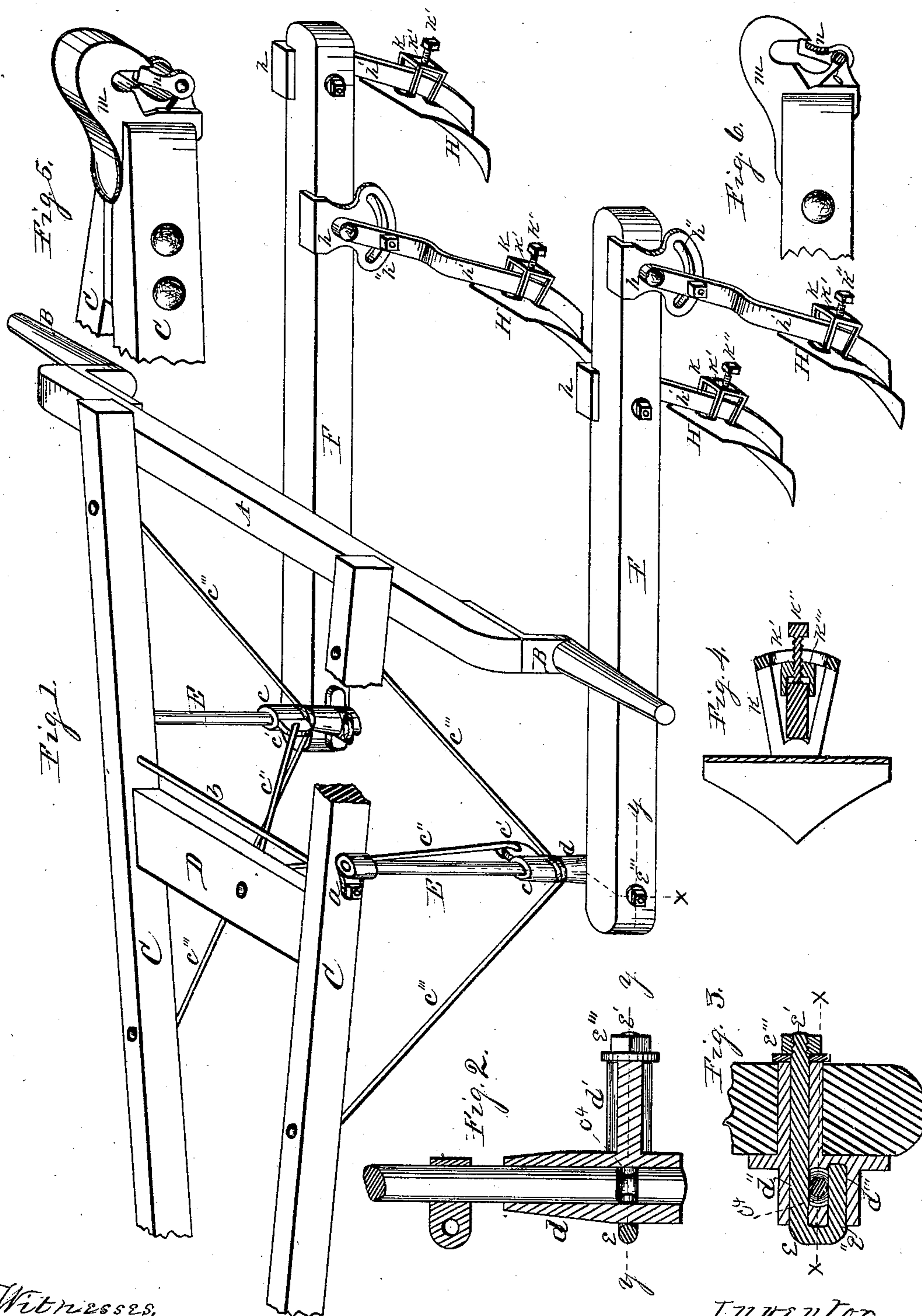


(No Model.)

W. A. KNOWLTON.  
CULTIVATOR.

No. 254,556.

Patented Mar. 7, 1882.



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 254,556, dated March 7, 1882.

Application filed December 15, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM A. KNOWLTON, a citizen of the United States, residing in the city of Rockford, in the county of Winnebago and State of Illinois, have invented new and useful Improvements in Cultivators, of which the following is a specification.

My invention relates to that class of cultivators known in the trade as "riding straddle-row cultivators;" and the object of my invention is to produce a reliable machine of simple construction at a small cost, capable of all the uses of the more complicated and expensive machines to be found in the trade. To this end I have designed and constructed the machine represented in the accompanying drawings, in which—

Figure 1 is an isometrical representation of the parts of a cultivator embodying my invention. Fig. 2 is a transverse vertical section of the hinge-joint connection of the shovel-beam with the pendant, on dotted line  $x$ . Fig. 3 is a horizontal central section of the shovel-beam hinge-joint connection with the pendant, on dotted lines  $y$ . Fig. 4 is a transverse section of the shovel and its connection with its standard centrally through the holding-screw. Fig. 5 is an isometrical representation of the forward end of the tongue-beams with its neck-yoke fastening, of which Fig. 6 is a side elevation.

In the figures, A represents the axle-tree; B, the crank-formed axle-arms, fixed to its end portions to receive the carrying-wheels to revolve thereon. C are tongue-beams, having their rear ends fixed to the axle-tree and connected in front thereof by the transverse beam D, all of which are substantially the same as like parts of cultivators now in use and to be found in the trade.

At E are represented pendants, made from suitable bar material, having their upper ends fixed in suitable supports,  $a$ , which are fixed in position to the tongue-beams by means of a transverse bolt,  $b$ , passed through the ears of their supports  $a$  and through the tongue-beams, and by means of a sufficient screw-nut to receive the screw-threaded end portion of the transverse bolt the parts are clamped and securely held in position. The lower portion

of these pendants are each provided with a collar,  $c$ , shrunk or welded thereon. These collars are each provided with an inward-projecting ear,  $c'$ , suitably perforated to receive the lower end portion of a brace-rod,  $c''$ , having a loop-connection therewith. The upper ends of these braces are suitably joined to the central portion of the transverse beam D, and serve to give lateral support to the pendants.

At  $c'''$  are represented brace-rods, fitted to receive the pendant below the collar, from which point they rise to meet the tongue-beams, to which they are securely fixed at suitable points forward and rearward of the connection of the pendant with the tongue-beam. By this arrangement of the parts I produce a truss-frame of a construction capable of more effectually resisting the downward pressure exerted upon the tongue-beams in the process of cultivation. The lower end portions of the pendants are fitted with an annular groove,  $c^4$ , of curved or square form in section.

At  $d$  is represented a tubular socket, fitted to receive the lower end portion of the pendants in such a manner as to permit it to oscillate thereon. This tubular socket is provided on one side with a tubular stud-journal,  $d'$ , projecting at right angles thereto, and in such relation to the tube of the socket that the axial opening  $d''$  of the stud-journal will coincide with the annular groove  $c^4$ , formed in the lower end portion of the pendant. It is also provided with an opening or hole,  $d'''$ , which in section is the same as the axial opening  $d''$ , and is on the same transverse or horizontal plane therewith relatively with the tubular socket, and in such relation to the tube of the socket that the opening or hole  $d'''$  will coincide with the annular groove  $c^4$ .

At  $e$  is represented a screw-bolt of hook-staple form, having its long arm,  $e'$ , fitted to enter the axial opening  $d''$  of the stud-journal, and its short arm,  $e''$ , to enter the hole  $d'''$  in such a manner that the arms of the staple will engage the annular groove  $c^4$  in the pendant and operate to hold the socket in connection therewith in such a manner as to permit it to oscillate thereon freely.

At F are represented drag-bars, which are of the usual form, rectangular in cross-section,



and of a suitable length. The forward ends of these drag-bars are fitted to receive the stud-journal  $d'$  of the vertical sockets on the pendant snugly, and in such a manner as to permit a vertical movement of the rear free end of the drag-bar and prevent an axial or rolling movement thereof. These drag-bars are held in position on the stud-journals by means of a screw-nut,  $e'''$ , which receives the screw-threaded projecting end of the hook screw-bolt  $e$ .

From the foregoing it will be seen that I produce at a small cost a reliable hinge-joint connection of the forward end of the drag-bar with the pendant, which will permit of the required lateral and vertical movements of the free end of the beams and hold them rigid to prevent axial or rolling movement thereof.

At  $h$  are represented brackets, provided with flanges to embrace the upper and lower edges of the beams, and they are placed on the opposite sides thereof on their rear end portions, at proper intervals, and are held in position thereon by means of a suitable screw-bolt passed through the upper end portion of the shovel-standard  $h'$ , through the bracket and beam, and by means of its screw-nut serving to fix the parts in position. These brackets extend below the beams in plate form, and are provided near their lower edges with a segmental slot,  $h''$ , concentric with the pivotal bolt of the standard which fixes the parts in place. These segmental slots receive the head portion of a suitable screw-clamping bolt passed through the segmental slot and through the shovel-standard, and by means of a screw-nut serve to fix the standard to the bracket with a force sufficient to hold it for the purposes of cultivation; but when subjected to a strain likely to break or otherwise injure the parts it will yield by slipping on the bracket-plate, and permit the standard, with the shovel thereto attached, to turn back to override the obstruction, after which it may be readjusted in its working position.

To render this device more effective, the rear of the slotted portion of the bracket is made of less thickness than its forward portion, which construction will permit the standard to turn backward freely when moved from its adjusted position.

At  $H$  are represented cultivator-shovels, of the usual form, made from plate material in the usual manner. To the back of these shovels is fixed a socket of skeleton-frame form, as represented at  $k$ , which receives the lower end portion of the shovel-standard  $h'$  in such a manner as to be capable of a vertical adjustment thereon, and is also capable of an adjustment to incline the face of the shovel at an angle with line of movement, either to the right or left, to throw the earth either to or from the plants. The rear portion of this skeleton-socket  $k$  is provided with a transverse slot,  $k'$ , through which a set-screw,  $k''$ , is passed to engage the back edge of the shovel-standard.

At  $k'''$  is represented a screw-nut fitted to receive the set-screw. The forward edge of this screw-nut is grooved to receive the rear edge of the standard, and is placed in position on the standard in the skeleton-frame socket to receive the set-screw  $k''$ , by means of which the shovel is fixed in position on the standard.

From the foregoing, in connection with the drawings, it will be seen that by slackening the set-screw the shovel may be adjusted vertically upon the standard, and may also be turned to the right or left to change the angle of the face of the shovel relatively with the line of movement, and when adjusted may be fixed in its adjusted position by means of the set-screw.

The forward ends of the tongue-beams are provided with a snap-hook adapted to receive the neck-yoke, and it consists of the hook-formed plate  $m$ , provided with a suitable flanged web portion to receive the forward ends of the tongue-beams, between which it is securely fixed by means of transverse bolts. The forward projecting portion of this plate  $m$  is of suitable hook form to receive the staple, ring, or other appliance of the neck-yoke employed to connect it with the hook. This hook is provided with a spring-snap,  $n$ , pivoted to the lower under end of the plate in such a manner that its free end will engage the inner edge of the free end of the hook, from which it will swing backward to permit the neck-yoke to be connected with and disconnected from the hook.

At  $o$  is represented a spring, coiled on the pivotal connection of the snap, and operating to hold it in connection with the hook, but in such a manner as to permit it to swing back.

In the foregoing I have only represented and described such parts of a cultivator as are necessary to illustrate the nature and application of my improvements; and the parts necessary to produce a complete machine not herein described and shown may be such parts of any of the various forms of cultivators as may be found convenient or capable of use in connection with the parts of the machine herein described and shown.

I claim as my invention—

1. The combination, with the main frame of a cultivator, of pendant  $E$ , having a suitable connection therewith, the truss-braces  $c'''$ , connecting its dependent portion with the tongue-beam both in front and rear of said pendant, the collar  $c$ , and brace  $c''$ , said parts being constructed and arranged substantially as described.

2. The combination, with a pendant provided with an annular groove, of a socket to receive the pendant and a bolt to engage the annular groove in the pendant, said bolt also serving to secure the shovel-beam to the socket-piece, said parts being arranged and operating substantially as described.

3. The combination, with the pendant and



with the socket provided with a lateral tubular stud-journal, of a shovel-beam journaled on the stud-journal and a bolt to connect the parts, substantially as and for the purpose  
5 hereinbefore set forth.

4. The combination, substantially as hereinbefore set forth, of the shovel, the skeleton-socket fixed to the shovel, the grooved or slot-

ted screw-nut and set-screw, and the shovel-standard, the several parts constructed and  
10 operating substantially as and for the purpose hereinbefore set forth.

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