

No. 649,197.

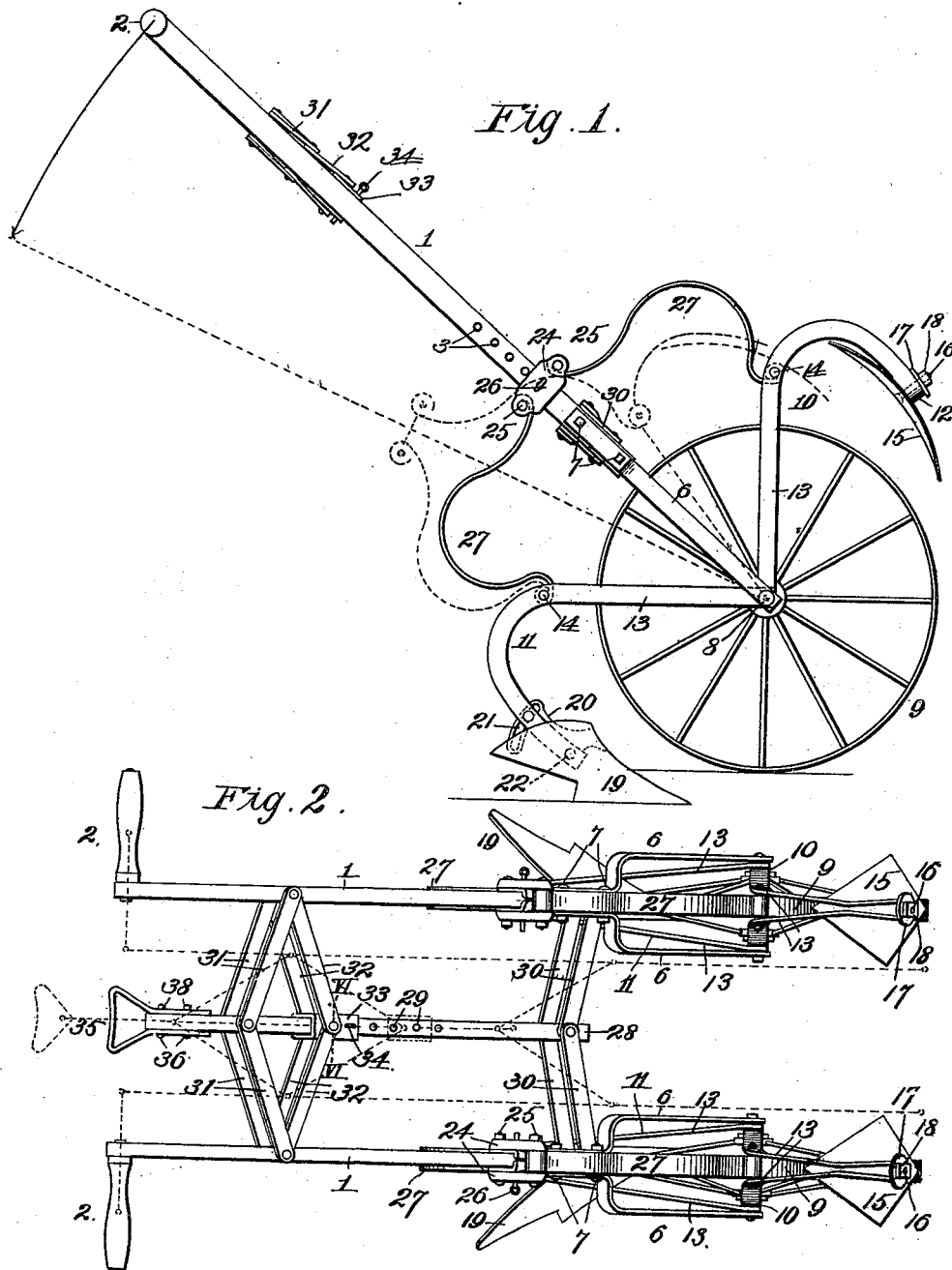
Patented May 8, 1900.

C. M. DURNELL.  
WHEEL CULTIVATOR.

(Application filed Feb. 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
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*J. S. Thrasher.*

Inventor:  
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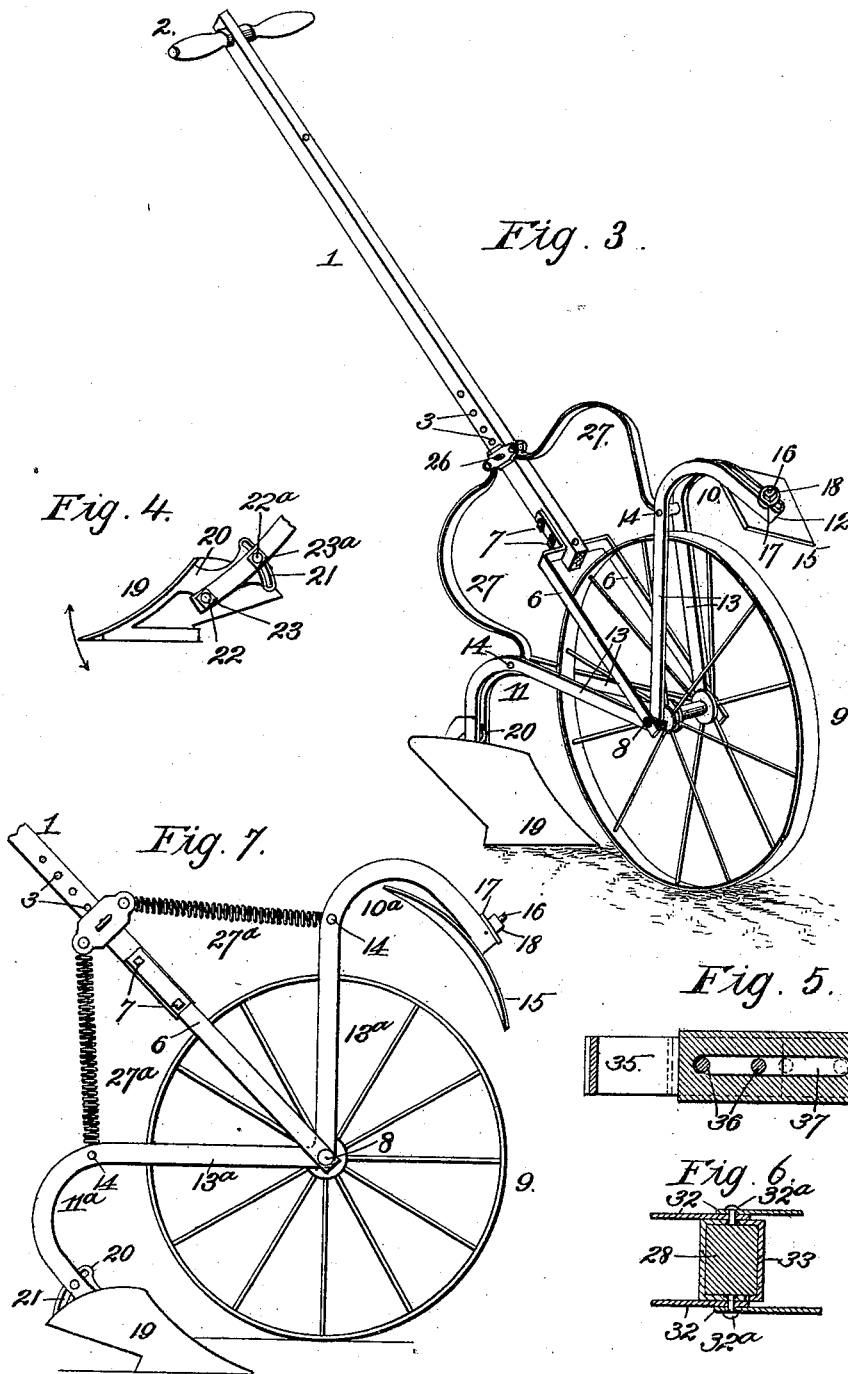
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# UNITED STATES PATENT OFFICE.

CECIL M. DURNELL, OF INDEPENDENCE, MISSOURI, ASSIGNOR TO PRESTON J. ROBERTS, FRANK ROBERTS, AND WILLIAM C. ROBERTS, OF SAME PLACE.

## WHEEL-CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 649,197, dated May 8, 1900.

Application filed February 27, 1899. Serial No. 707,053. (No model.)

*To all whom it may concern:*

Be it known that I, CECIL M. DURNELL, of Independence, Jackson county, Missouri, have invented certain new and useful Improvements in Wheel-Cultivators, of which the following is a specification.

My invention relates to wheel-cultivators, and more particularly to the type which are propelled by the operator walking behind; and the objects of my invention are to produce a cultivator of this type wherein the draft or power is centrally applied in order to obviate any tendency of the wheel to twist or turn sidewise, and render the propulsion more difficult, and wherein the handle may be vertically adjusted for the convenience of the operator, or for the accommodation of persons of varying heights.

A further object of the invention is to produce a machine which can be adjusted to accommodate rows of different widths and at the same time maintain the supporting-wheels parallel with each other and with the line of draft.

A still further object is to produce means whereby the operator may be enabled to bring to bear on the cultivator the direct pressure of his body in addition to that applied with his hands.

Other objects of the invention will hereinafter appear and be pointed out in appended claims, and in order that the invention may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 represents in side elevation a hand-cultivator embodying my invention. Fig. 2 represents a top plan view of the same. Fig. 3 represents a perspective view of the single-wheel type. Fig. 4 is a detail view showing the inner side of the "turning-plow" and adjustable connection with its shank. Fig. 5 is a vertical section of the upper end of the adjustable bar. Fig. 6 is a cross-section taken on the line VI VI of Fig. 2. Fig. 7 illustrates a modified form of the cultivator.

In the said drawings, 1 designates a pair of parallel bars provided at their rear ends with handles 2 and a suitable distance from their front ends with a series of laterally-extending holes 3. The front end of each bar is forked—that is to say, is provided with

forwardly-extending approximately-parallel arms 6, of metal, bolted to opposite sides of the bar at their rear ends, as shown at 7.

Secured in the front ends of the fork of each bar is a shaft 8, and journaled upon said shafts are supporting-wheels 9.

10 and 11 designate two similar frames or shanks for the cultivating-shovels hereinafter mentioned, and said shanks or frames consist each of a metal bar bent at its middle, as at 12, to provide the hook-shaped arms 13, which straddle the wheels and are journaled upon said shaft, said shanks or frames being arranged snugly between the arms 6 of the forks and said wheels in order that there shall be no lateral play or movement upon the shafts of either said wheels or said shanks, and the latter normally extend at right angles to each other, the arms 13 of each being connected by the bolts 14, which thus add rigidity and strength to the shanks and serve another purpose, which will hereinafter appear.

15 designates in this instance what is known as a "diamond" plow, which is fitted within the fork of shank 10, and it is secured thereto by means of a bolt 16, extending centrally through the plow and between the arms of said shanks adjacent to the bend 12, a nut 18 engaging the outer end of said bolt to clamp the plow and the washer 17 upon the bolt firmly against opposite edges of the shank. By this arrangement it is obvious that said plow when in operative position will not only cut the earth in the line of draft, but may also be adjusted longitudinally by moving the bolt 16 nearer to or farther from the free end of the shank, as will be readily understood by reference to Figs. 2 and 3.

If desired, a different form of cultivating appliance, such as a "turn-plow" 19, may be mounted upon the free end of the shank 11, and in order that the angle of this plow may be varied to increase or reduce the depth of cut it is provided at its inner side with a plate 20, having a segmental slot 21 at its rear end and adapted to fit between the outer ends of the arms 13 of shank 11 and be pivotally connected to said arms concentrically of the slot 21 by means of the bolt 22, the clamping-nut 23 engaging said bolt to make the connection reliable. 22<sup>a</sup> designates a bolt extending

through said shank and the slot 21, and 23<sup>a</sup> a nut engaging said bolt and adapted to clamp the arms 13 firmly against opposite sides of the slotted portion of plate 20, and thereby secure the plow at any desired angle. From the foregoing it will be apparent that this plow, as well as the plow 15, operates in the line of draft and that the pressure applied by the operator upon the handles 2 is also in the center of the line of draft, owing to the fact that the wheel is journaled centrally within the forks of said handles, and it is furthermore obvious that this statement applies with equal force to the single-wheel cultivator (shown in Fig. 3) and the double-wheel cultivator (shown in Figs. 1 and 2.)

A sliding sleeve mounted upon each bar 1 consists of a pair of side plates 24, connected above and below the bar by the bolts 25, and said sleeve is by preference secured at the desired point upon the bar by means of a pin 26 extending through the sleeve and one of the holes 3 of the bar.

In order to hold the plows down to their work with a pressure which will yield to such obstructions as a root or stump of a tree or a large rock, I by preference employ the leaf-springs 27, which are pivoted at their opposite ends to the bolts 14 and 25.

The description thus far is applicable to either the single-wheel cultivator or to the double-wheel cultivator, the latter being in form no more than two of the single-wheel cultivators arranged side by side and connected together by parts, which I will now proceed to describe.

28 designates an adjusting-bar which extends centrally between the parallel bars 1 of the double-wheel cultivator and is provided at a suitable point with a series of holes 29 and is pivotally connected at its lower end to the lower ends of said side bars by means of the links 30, the latter forming simply a toggle-joint between said bars 1. 31 designates similar links which pivotally connect the bar 28 with the bars 1, said links 31 extending parallel with the links 30 at the same side of the adjusting-bar. 32 designates similar links pivotally connected at their outer ends to the bars 1 coincidentally with the connection with the latter of links 31 and pivotally connected at their inner ends to trunnions or pins 32<sup>a</sup>, projecting from the upper and lower sides of the sliding sleeve 33 upon bar 28, said sliding sleeve having a pin 34, adapted for engagement with one or another of the holes 29 of said bar for a purpose which will hereinafter appear.

35 designates a breast-plate having its arms embracing opposite sides of the upper end of bar 28 and secured thereto by means of bolts 36 extending through the slot 37 of the bar, clamping-nuts 38 engaging the threaded ends of said bolts in order to secure the breastplate at the desired point of adjustment on the bar.

By means of the toggle-joint connection be-

tween bars 1 it is obvious that the wheels must always travel in parallel lines to the end that the operation of the machine may be accomplished with the least application of power and that the work thereby will be facilitated.

In the practical operation of this machine the handles are grasped by the operator and the machine pushed across the field, with the plows or shovels making a cut of uniform depth, this depth of cut being easy to maintain because the propelling force goes direct to the wheel and not to the plow. For the same reason the machine runs easy and the springs tend to hold the plows down to their work. If an obstruction should be encountered by the plow, and thereby cause the operator to unavoidably increase the pressure on the handles, the bars either swing forward and upward without appreciably varying the position of the plow in the ground, because the springs under such increased pressure stretch or the plow swings upward out of the ground and compresses its respective spring until the obstruction is cleared, when the spring automatically forces the plow downward and ready for the continued operation of the machine.

If the position of the handle is not such as to give the operator his greatest and most convenient leverage for propelling the machine, it may be raised or lowered within certain limits by sliding the sleeve 24 forward or rearward on the bar 1 and locking it at the desired point by the engagement of its pin 26 with the registering hole 3 of the bar. If the machine is to be operated by a boy, the handle can be lowered from the position shown in full to the position shown in dotted lines, Fig. 1, this being accomplished in the manner before explained, and it will be noted in this connection that the depression of the handle does not compress the spring 27, connecting the handle to the shank of the plow in the ground, as said spring simply swings pivotally on the bolt 14, the distance between said bolt and bolt 25 remaining the same under this adjustment, as will be seen by reference to Fig. 1.

In traveling to and from the field it is obvious that it is only necessary to raise the handle sufficiently high to lift the cultivating-shovels clear of the ground, and while I have illustrated the machine as provided with a "diamond" and a "turning" plow it is obvious that other cultivating appliances may be used in lieu thereof, if desired.

In the use of the double-wheel plow the power of the operator's hands may be supplemented by bracing the breast-plate 35 against his breast, as will be readily understood; and in order to obtain the best results in this connection the breast-plate may be adjusted farther in or out, as necessary. If it is desired to cultivate rows of different widths, this can be accomplished by withdrawing pins 34 and then pushing forward or pulling rearward, as

the case may be, on the bar 28. The forward movement of said bar expands the toggles simultaneously and thereby widens the distance between the plows, while the rearward movement contracts the toggles, and thereby narrows the distance between the plows. They may be secured reliably at either point of adjustment by causing the engagement of pin 34 with the registering hole 29.

10 In Fig. 7, in lieu of the shanks 10 and 11, independently pivoted on shaft 8, I provide two shanks 10<sup>a</sup> 11<sup>a</sup>, which are integrally formed or rigidly secured together and pivoted on the shaft, so that the movement of one shovel affects the position of the other. 15 With this double-shank construction, which is precisely the same as the single shank—that is to say, is composed of arms 13<sup>a</sup>, arranged astride of the wheel 9—I employ retractile springs 27<sup>a</sup> to take the place of the oppositely-acting springs 27. By this arrangement it is obvious that if the appliance embedded in the ground strikes an obstruction it is prevented from swinging upward too easily by the spring 27<sup>a</sup> above the wheel, while 25 the other spring 27<sup>a</sup> will permit the handle of bar 1 to swing forward on the shaft some distance without withdrawing the plow from the ground. Thus it will be seen that the substitution of the double shank for the independent single shanks makes necessary the substitution of the springs 27<sup>a</sup> for the springs 27; but it is equally obvious that said parts are the equivalents of each other, because 35 they accomplish the same work in substantially the same manner. However, no special claim is made to this construction, except in the method of connecting the springs 27<sup>a</sup> to the bar 1, which method is common in the several illustrations. 40

From the above description it will be apparent that I have produced a hand-cultivator which embodies the features of advantage enumerated as desirable in the statement of invention and that while the drawings illustrate the preferred embodiment of the invention I reserve the right to make such changes as properly fall within its spirit and scope. 45

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A cultivator, comprising a wheeled frame, a shank pivoted to said frame and provided with a cultivating appliance, and a yielding connection between said shank and the frame, the connection with said frame being adjustable to permit a variation in the angle between the frame and the shank, substantially as described. 55

2. A cultivator, comprising a wheeled frame embodying a bar mounted on the shaft or axle of said wheel, a shank pivoted upon said shaft, and provided with a cultivating appliance, an adjustable sleeve upon said bar, a spring pivotally connecting said sleeve and said shank, and means to secure said sleeve at the desired point on said bar, substantially as described. 60 65

3. A cultivator, comprising a wheeled frame embodying a bar pivoted at its front end upon the shaft or axle of said wheel, and provided with a series of holes, a shank pivoted upon said shaft, and provided with a cultivating appliance, a sleeve mounted upon said bar, a pin carried by said sleeve and adapted to engage any one of the holes in said bar, and a spring connecting the sleeve and the shank, substantially as described. 70 75

4. A cultivator, comprising a wheeled frame, shanks pivoted upon said frame and provided with cultivating appliances at their outer ends, yielding connections between said shanks and said frame, a bar 28, links 30, 31 and 32 pivotally connecting said bar with said frame, the links 32 being longitudinally adjustable upon said bar, and means for securing said links and said bar in the desired relation, substantially as described. 80 85

In testimony whereof I affix my signature in the presence of the witnesses.

CECIL M. DURNELL.

Witnesses:

PRESTON J. ROBERTS,  
BELLE BRYANT,  
JESSE P. CRUMP.