(No Model.)

C. E. McBETH.

CULTIVATOR.

No. 365,398. Patented June 28, 1887.

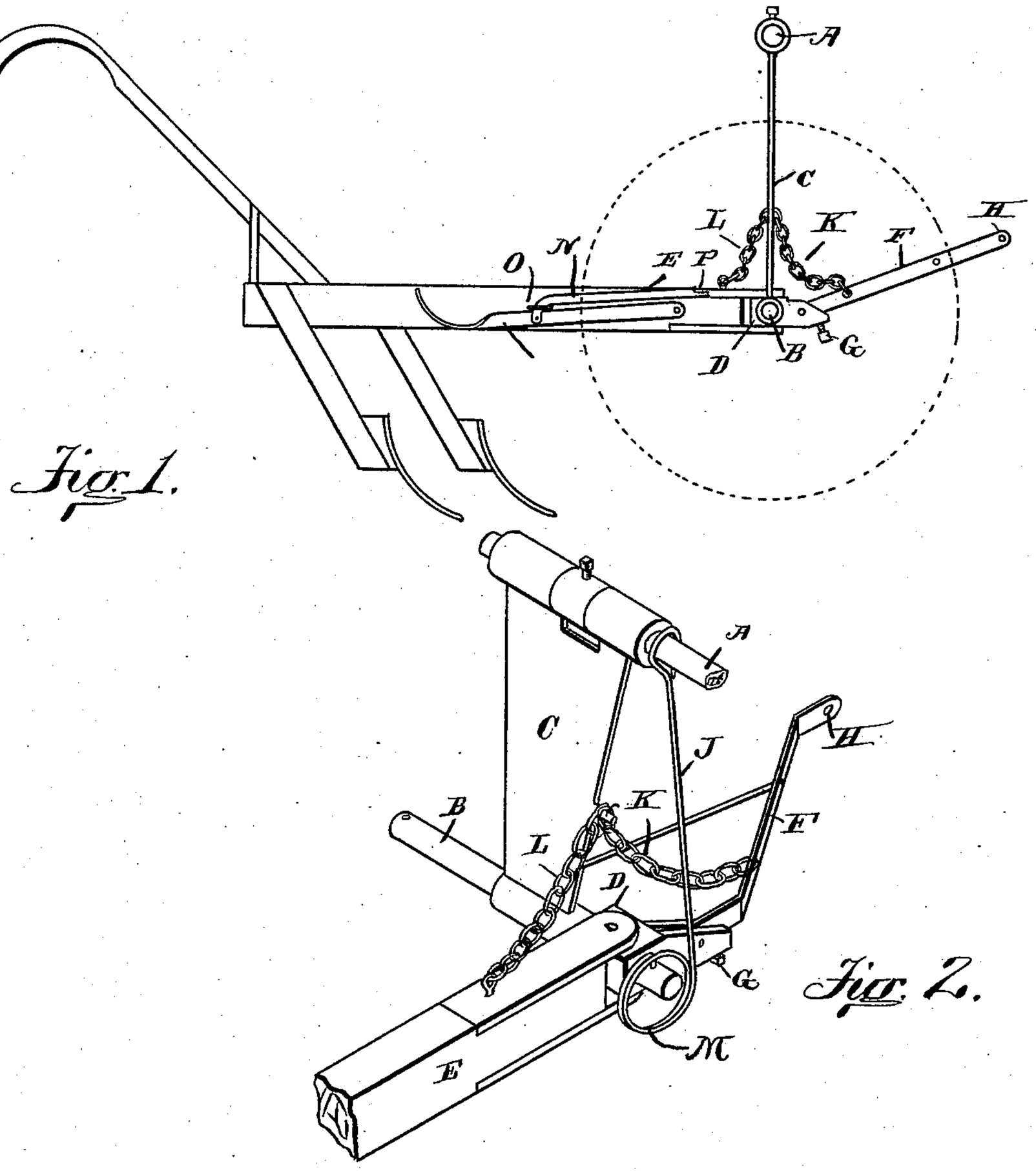

Fig. 1.

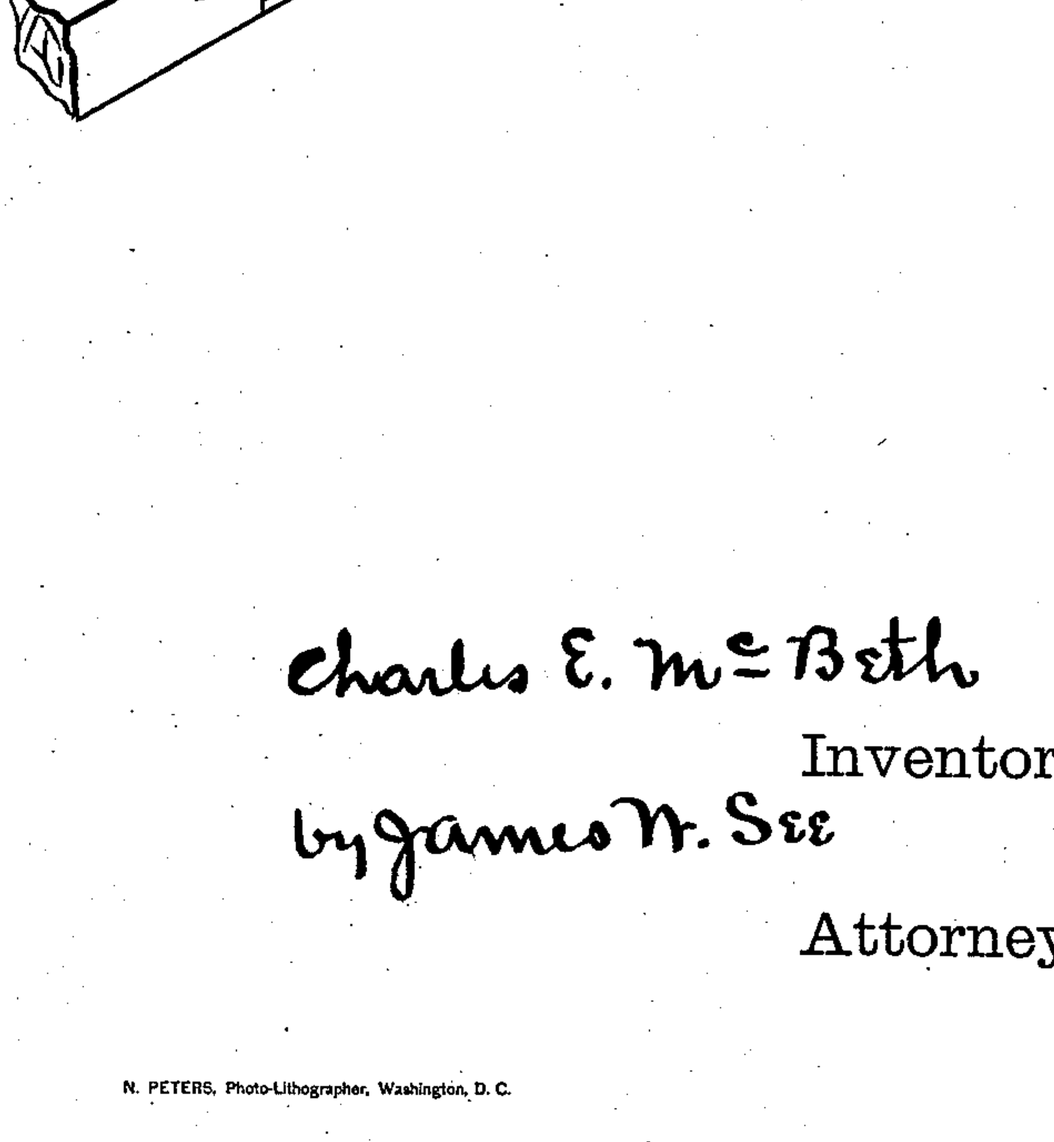

Fig. 2.

Witnesses:
W. A. Seward
C. A. Fisher

Charles E. McBeth
Inventor
by James N. See
Attorney

UNITED STATES PATENT OFFICE

CHARLES E. McBETH, OF HAMILTON, OHIO.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 365,398, dated June 28, 1887.

Application filed May 14, 1887. Serial No. 238,187. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. McBETH, of Hamilton, Butler county, Ohio, have invented certain new and useful Improvements in Cultivators, of which the following is a specification.

This invention pertains to that class of cultivators known as "tongueless," an example of which may be found illustrated and described in Long's patent, No. 329,919, of November 10, 1885, to which reference is hereby made.

The improvements relate to devices at the clevis-point of each plow-beam adapted to guard against one of the plows getting too far in advance of the other, and to a peculiarity of construction of the arch-supporting spring.

My improvements will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a tongueless cultivator, serving to illustrate my improvement; and Fig. 2, a perspective view of the forward end of one of the plow-beams, together with arch and clevis parts contiguous thereto.

In the drawings, A illustrates the cylindrical arch-bar; B, the axle-stubs fitted to have the wheels revolve loosely upon them; C, the standards, one for each side of the cultivator, the standards being freely journaled at their tops upon the arch-bar and at their bottoms upon the respective axle-stubs; D, a block rigidly secured to the inner end of each axle-stub just within the lower bearings of the standard; E, the plow-beams pivoted at their front ends to the respective blocks, the axis of the connecting-pivot being vertical; F, the clevis, one at the foot of each standard, this clevis being in the form of a forwardly-reaching lever pivoted at the rear end to forward projections from the blocks D, and having, also, outside braces pivoted at the lower ends of the standards, whereby side stiffness is given to the clevis; G, a set-screw in each of the forward projections of the blocks D, this set-screw serving as an adjustable stop to limit the downward motion of the pivoted clevis with reference to the blocks; H, the hitch-point in the forward end of each clevis, the point at which the singletree is to be attached.

As thus far referred to, the parts do not differ in arrangement or mode of operation from corresponding parts set out in the Long patent referred to. The plow-beams are free to be moved independently sidewise, oscillating upon the vertical pivots by which they engage the blocks D. They are free to move vertically independently of each other, the rotation of the axle-stubs in the wheels permitting the oscillation. The clevises are free to rise at their forward ends, but have an adjustable limit to their downward motion, secured by means of the set-screws G.

Confining the demonstration to the parts that have been referred to, and to the action indicated in the Long patent, one plow-beam may be drawn far in advance of the other plow-beam, the only limit to this advance being the lengths of the standards. Thus one of the plows might be drawn forward until that standard lies down backward horizontally with the arch-bar resting on the plow-beam, the other standard reaching backward to the other plow far in the rear, providing of course that the springs are sufficiently yielding. Thus one plow might advance, with reference to the other, a distance equal to about twice the height of the arch. This almost unlimited capacity on the part of the machine to stretch out is very undesirable, and often renders the handling of the implement very difficult with a team pulling unequally, and under most all circumstances the operation is such as would result from the use of a team pulling unequally.

Proceeding now with further reference to the drawings, J indicates a spring having an eye at its upper end engaging the arch-bar, and having its lower end inserted like a linch-pin through the inner end of the stub-axle, there being of course one of these springs at each side of the arch, the office of the springs being to flexibly support the arch in substantially vertical positions with reference to the plow-beams, the same as in the Long patent; K, a short slack chain with its upper end engaging a stud upon the appropriate standard, and with its lower end engaging the clevis at a point forward of the clevis-pivot, it being understood, of course, that the arrangement of chain indicated is in duplicate, one at each side of the machine; L, a similar chain, similarly attached to the standard, but having its

lower end secured to the plow-beam a short distance rearward of the stub-axle; M, a coil in the lower end of each spring J, the axis of the coil being substantially in the line of the axis of the stub axle, that portion of the spring which engages, after the manner of a linchpin, with the stub-axle being formed by a forward radial prolongation upon the coil. The chains K and L are normally slack, and they do not interfere with the raising of the clevises, or with the raising or lowering of the plow-beams, or with the side motion of the plow-beams, or with a reasonable amount of backward or forward oscillation of the arch-standard, or with a reasonable advance of one plow with reference to the other; but the length of the chains is such as to limit the advance of one plow with reference to the other. As the plows separate, one advancing with reference to the other, the arch-bar naturally seeks an intermediate position, the spring of the lagging plow tending to hold the arch-bar back, while the spring of the advancing plow tends to pull it forward. The arch-standard of the lagging plow will obviously lean forward, and the arch-standard of the advancing plow will obviously lean backward. The angle between the clevis of the advancing plow and the arch-standard of that plow will thus obviously have been rendered more obtuse. This increase of this angle tends to tighten the forward chain of the advancing plow, and the chain is to be of such length as to become taut when the desired limit of the advance of one plow over the other has been reached. In a similar manner the angle between the lagging plow-beam and the arch-standard of that plow has been increased and the rear chain of that plow tightened. The result is, that when the forward chain of the advancing plow and the rear chain of the lagging plow are both taut the standards can oscillate no farther with reference to their respective plow-beams. Hence it will be impossible for one of the plows to lag so far behind the other as to stretch the articulated arch system out until the arch-bar lies down upon the beams of the advancing plow. As a matter of fact, the chains can be adjusted in length so as to always maintain the arch-standard in a substantially vertical position without at all interfering with the movement of articulation and freedom of action essential to the proper working of the implement. The upper ends of the chains are attached to the standards by simply engaging the chain-links with studs projecting one from each standard. A chosen link of the chain may engage with the studs, so that the permissible oscillation of the arch may be limited, as desired. If the chains be unhooked from the studs, the chain function is entirely suppressed, and the operator of the implement immediately becomes impressed with the fact that he has an unequal-pulling team. When the chains are hooked up to the studs, the result is very much the same as if he had exchanged his team for an even-pulling one.

It should be understood that the arrangement constitutes virtually a tension system by which the forward plow drags the lagging plow when the lagging plow has fallen a certain distance behind. The clevises when under the strain of draft are practically fixed so far as their horizontal position is concerned. When a horse is pulling upon its clevis, the clevis will not lift under the upward pull of its forward chain. Hence the clevis, at a point forward of its pivot, forms a draft-point for the chain system. The draft-strain upon the forward plow is, of course, directly from clevis to plow-beam of that plow. The draft-strain of the dragging plow is first through the clevis of the advancing plow; next, through the advancing chain of the advancing plow; next, from the upper end of this chain to the top of its standard; next, across the arch-bar; next, down the standard of the lagging plow; next, from the rear chain of the lagging plow to the lagging plow. In this way it is possible, though not with practical satisfaction of course, for one horse or two horses, hitched to one clevis only, to pull both plows, the plow to which no direct hitch is made of course lagging the limited distance in the rear. Thus it will be seen that a draft system is provided connecting the two plows.

It is highly important that such draft system should not interfere with the lifting of either plow from the ground, as must often be done in cleaning from trash, clearing obstructions, &c. The draft system provided does not interfere at all with the proper movements. With the forward plow the front chain is taut and the rear chain slack. With the lagging plow the rear chain is taut and the forward chain slack. If the lagging plow be lifted from the ground, its taut rear chain simply slackens. If the forward plow be lifted from the ground, its taut forward chain does not slacken; but the plow simply oscillates forward upon the stub-axle, leaving the entire draft system unimpaired, the draft being still transmitted through the draft system from the clevis of the forward plow to the lagging plow. This quality arises from the capacity of the chains to slacken. Any other forms of connections may be substituted for the chains K and L, so long as such connecting contrivance attaches to the arch above the stub-axle to the plow-beam in the rear of the stub-axle and to the clevis forward of its pivot. The coils M of the springs J being disposed at the axis of oscillation of the arch-standards permits a free and elastic flexing of the springs, the action being that of a coil-spring acting torsionally at a pivot of oscillation. When the coil is arranged at an intermediate point at the height of the springs, the flexure of the springs becomes concentrated largely at the coil-point and the flexing action is that of a more or less rigid bar with a weak point in its center.

I claim as my invention—

1. In a tongueless cultivator, a stub-axle, an arch-standard rising therefrom, a plow-beam

articulated at its forward end to the base of the standard, a clevis projecting lever-like forward of the plow-beam and pivoted at its rear end, and connections capable of yielding endwise or slacking, reaching from the arch-standard above the stub-axle, respectively, to the plow-beam in the rear of the stub-axle and to the clevis forward of its pivot, combined substantially as and for the purpose set forth.

2. In a tongueless cultivator, a stub-axle, an arch-standard rising therefrom, a plow-beam articulated at its forward end at the base of the standard, a clevis projecting lever-like forward of the plow-beam, a chain attached at its upper end to the standard and at its lower end to the clevis, and a chain attached at its upper end to the standard and at its lower end to the plow-beam, combined substantially as and for the purpose set forth.

3. In a tongueless cultivator, a stub-axle, an arch-standard rising therefrom, an arch-bar engaging the top of the standard, a plow-beam articulated at the foot of the standard and provided with a clevis, and a spring engaging the arch-bar and extending downward, and provided at its lower end with a coil at the stub-axle and engaging the stub-axle, combined substantially as and for the purpose set forth.

CHARLES E. McBETH.

Witnesses:
J. W. SEE,
W. A. SEWARD.