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H. H. SATER.

CULTIVATOR.

No. 333,163. Patented Dec. 29, 1885.

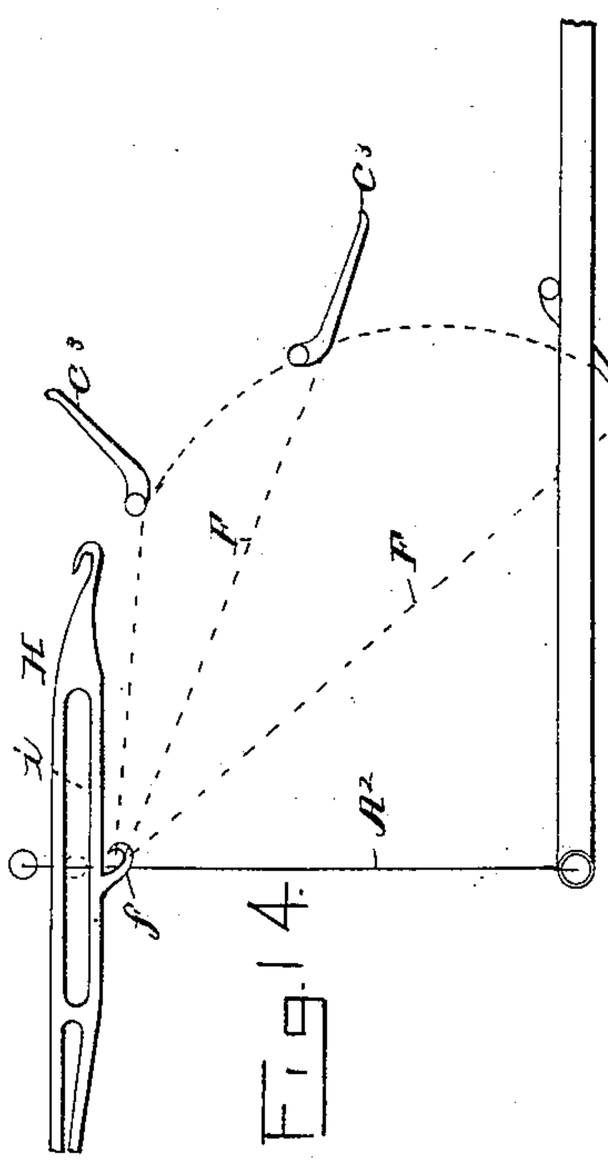

Fig. 4.

Fig. 1.

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Fig. 2.

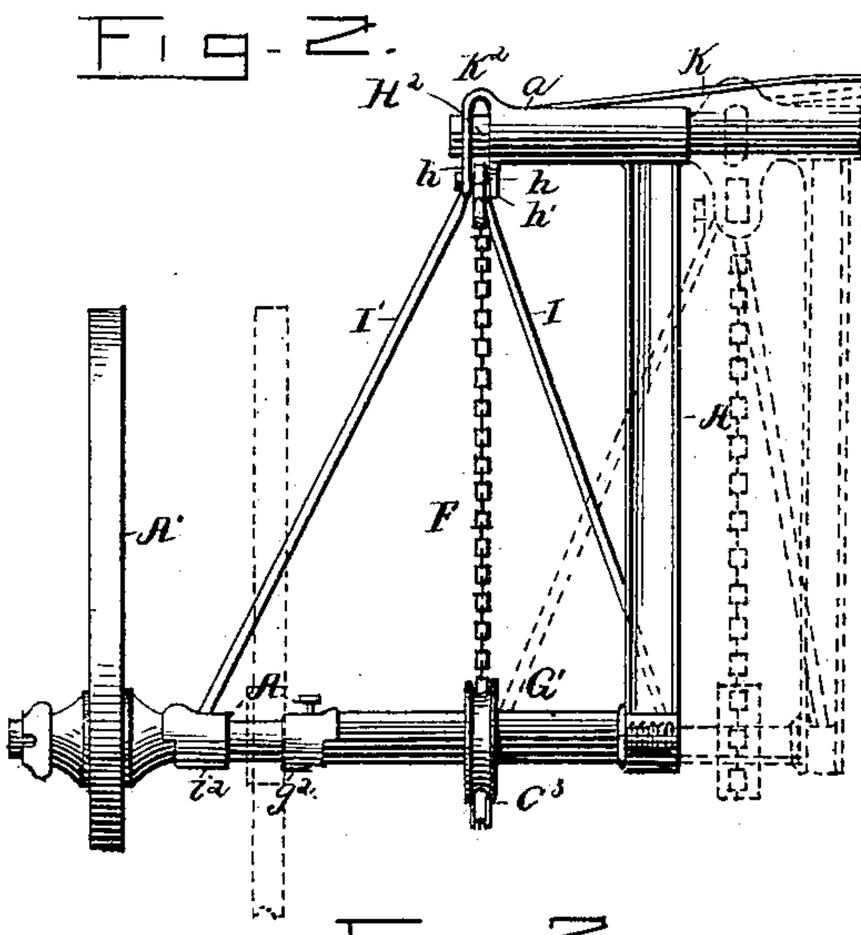

Fig. 3.

Fig. 4.

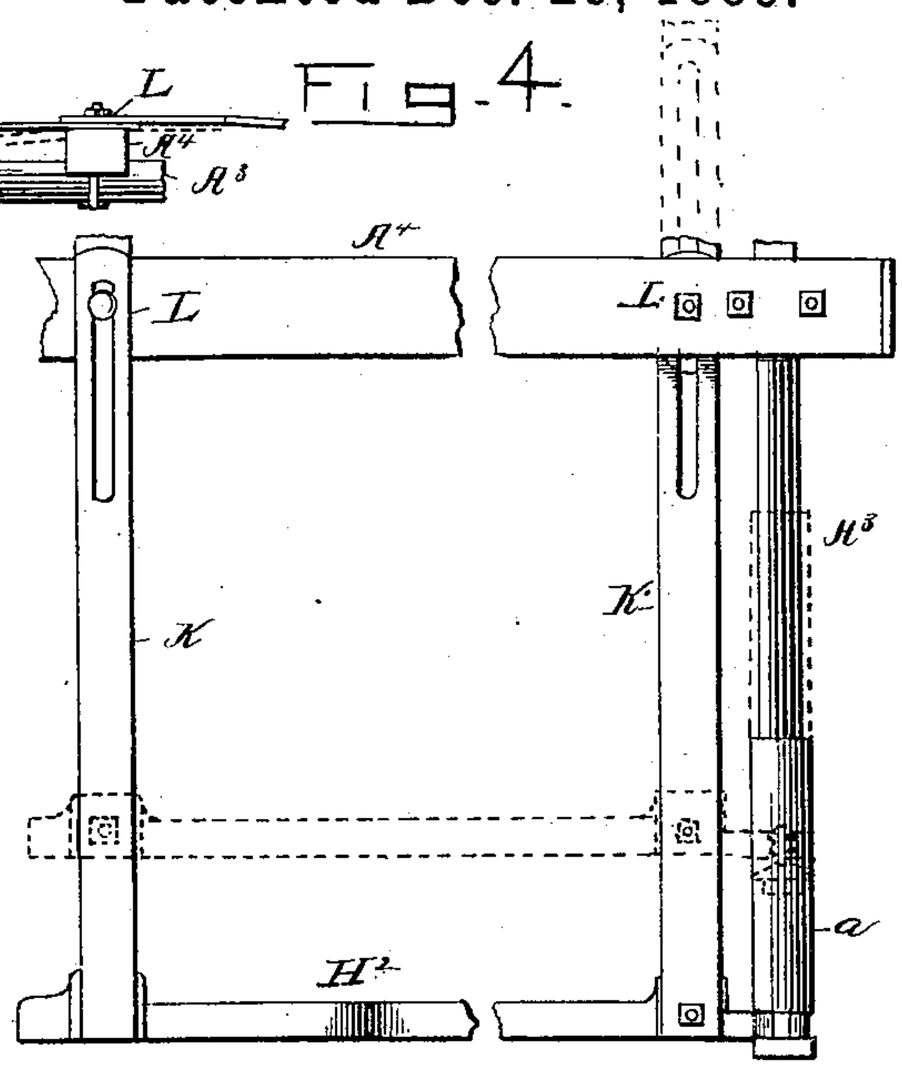

Fig. 5.

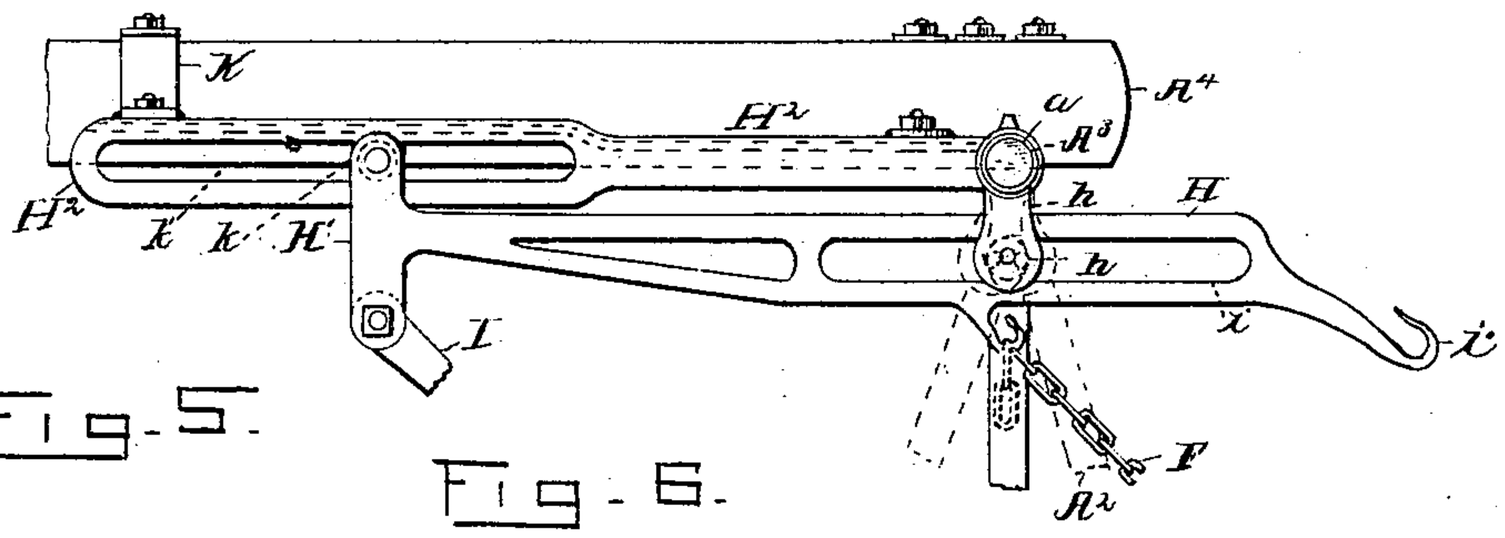

Fig. 6.

Fig. 7.

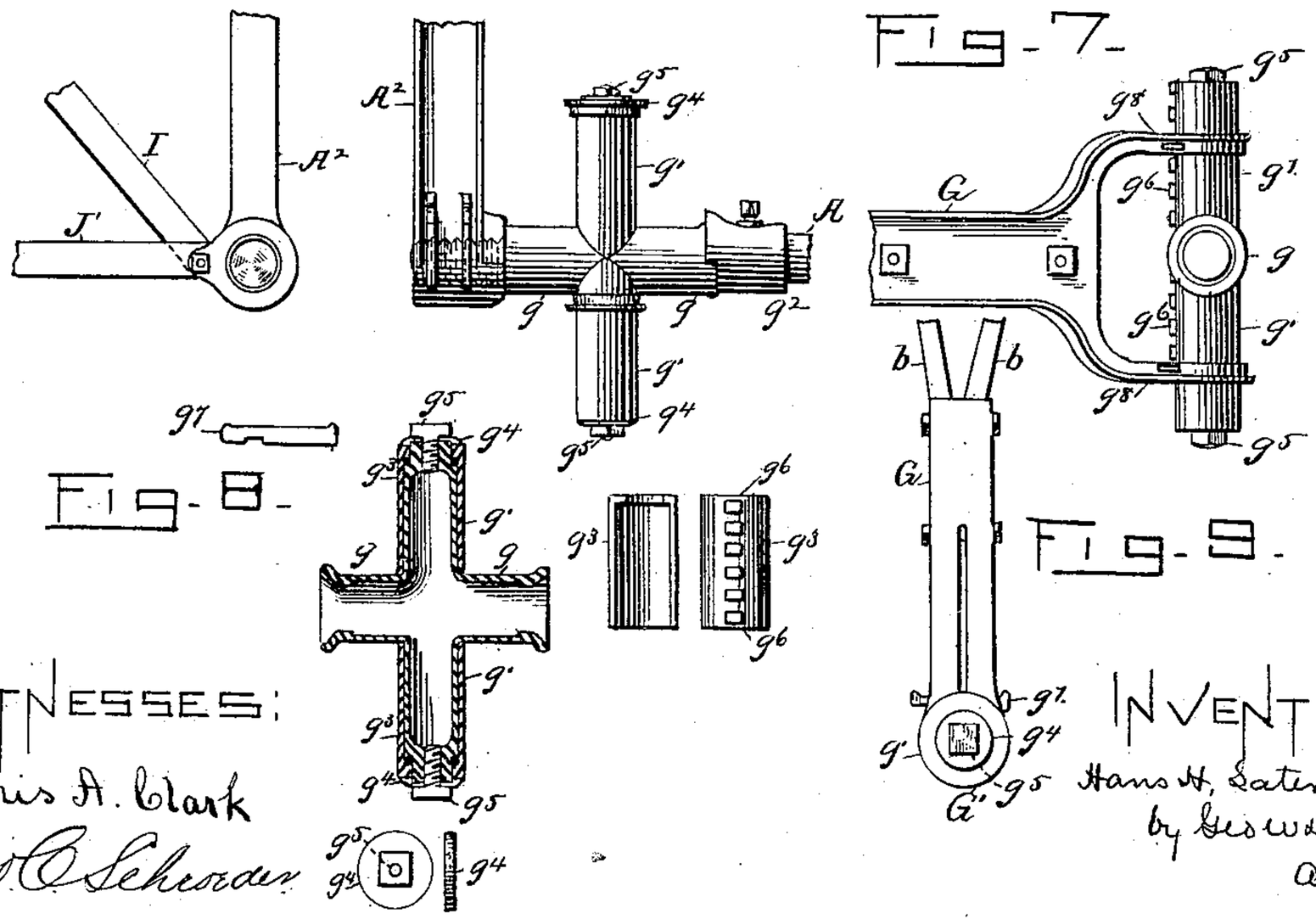

Fig. 8.

Fig. 9.

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Fig. 10.

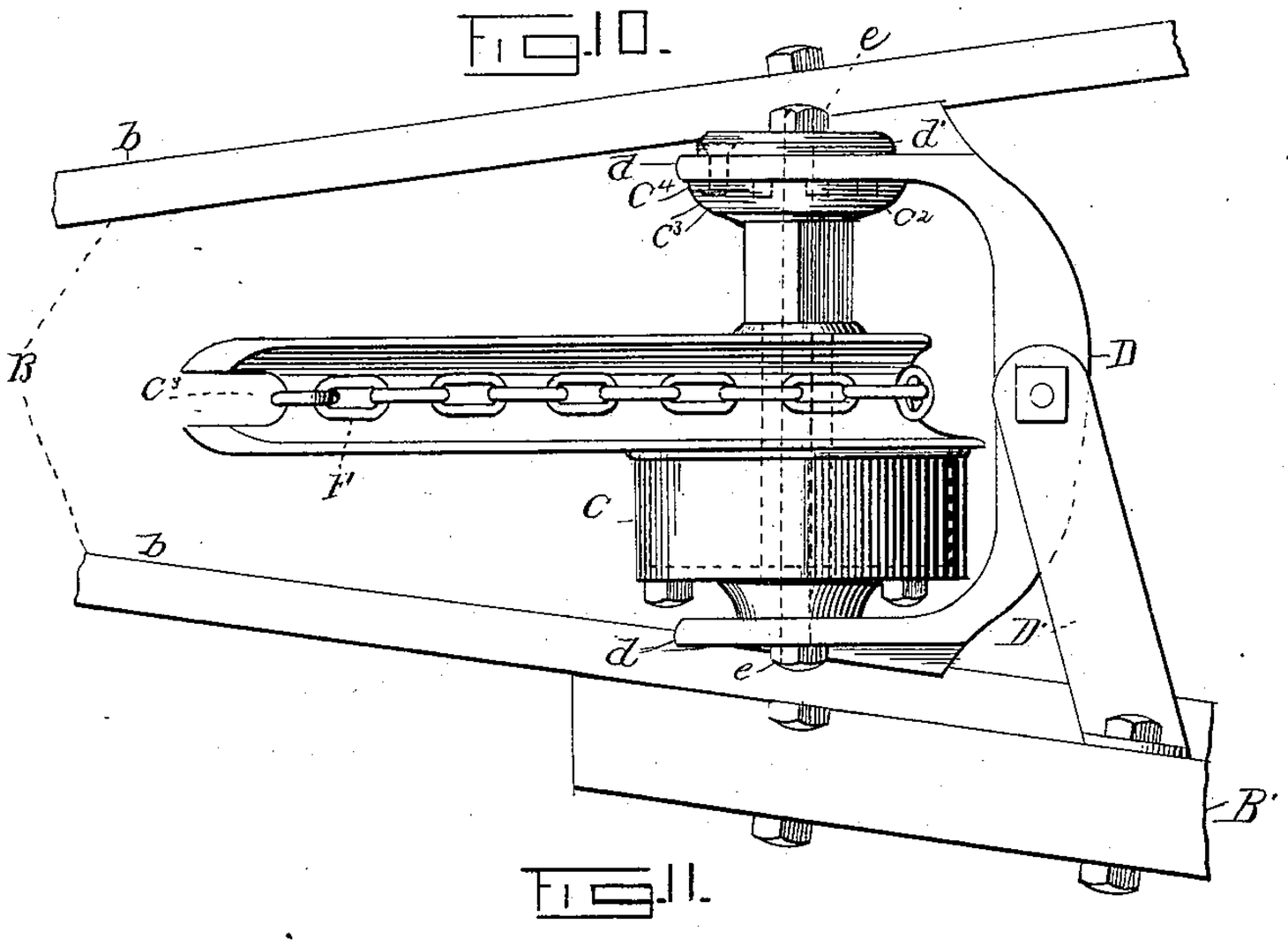

Fig. 11.

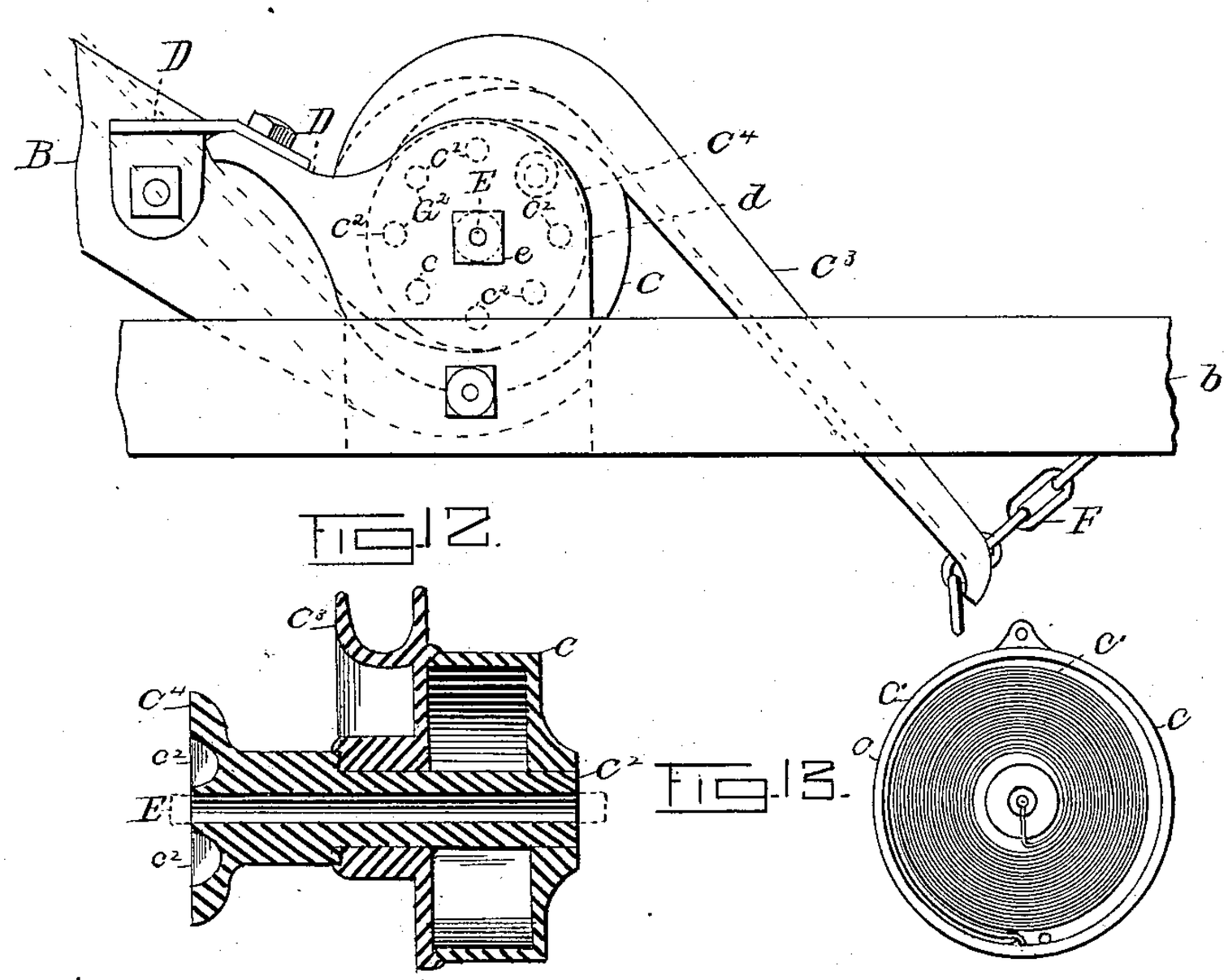

Fig. 12.

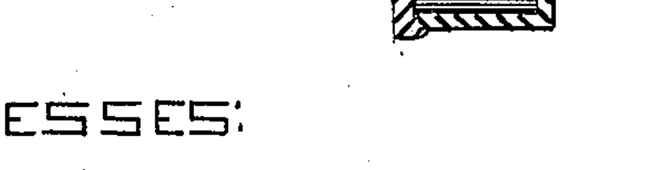

Fig. 13.

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UNITED STATES PATENT OFFICE.

HANS H. SATER, OF DUBUQUE, IOWA.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 333,163, dated December 29, 1885.

Application filed April 25, 1885. Serial No. 163,394. (No model.)

To all whom it may concern:

Be it known that I, HANS H. SATER, of Dubuque, in the county of Dubuque and State of Iowa, have invented a new and useful Improvement in Cultivators; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

This invention relates to improvements in wheel-cultivators, whereby each side of the same is adapted to act entirely independent of the other, and whereby there is produced an oscillating cultivator so braced that it is made as strong as a rigid cultivator.

These improvements further comprise means for raising and lowering the shovels together with their beams and for holding the same in any desired position, means for coupling the shovel-beams to the axle and for adjusting the same both vertically and horizontally upon the axle, means for allowing independent movement back and forth of each side of the cultivator and its attachments, and means for horizontally adjusting the sides of the cultivator with their attachments toward or away from each other, to regulate the space between the rows.

These are the essential features of my invention, and the novelty thereof lies in the construction and combined arrangement of the several devices for effecting these various adjustments and operations, all as more fully hereinafter described and claimed.

Attention is invited to the accompanying drawings, whereby a better and more thorough understanding of these improvements may be had in connection with the description in detail.

As my improvements comprise a cultivator made in two independent sections or sides of like construction with like attachments, for convenience I have illustrated and will describe the parts embracing but one of said sections or sides and the connections between the two, and accordingly—

Figure 1 represents one of the sections or sides of my improved cultivator in perspective, with portions broken away and other portions in dotted lines; Fig. 2, a rear elevation of this section, showing the means for effecting its horizontal adjustment toward the center; Fig. 3, a side elevation of the means for allowing the independent movement back and forth of this section; Fig. 4, a plan of a portion of the top of the cultivator, showing particularly the connections between the two sections or sides; Fig. 5, a detail showing the connection between the arch-stem and draft-connections; Fig. 6, a detail of the coupling for the shovel-beams; Fig. 7, a detail of this coupling and its connection with a yoke on the inner end of a set of shovel-beams; Fig. 8, a section of this coupling and views of its parts detached; Fig. 9, a plan of the coupling and a portion of a set of shovel-beams attached to the same; Fig. 10, a plan of a set of shovel-beams and the means for raising and lowering the same, with portions broken away and other portions in dotted lines; Fig. 11, a side elevation of the same, partly broken away; Fig. 12, a transverse horizontal section of the means for raising and lowering the shovel-beams; Fig. 13, a vertical section of a portion of this mechanism and its inclosures, and Fig. 14 a diagram illustrating the various positions assumed by a lever forming a part of this lifting mechanism.

Like letters refer to corresponding parts in the several views.

As hereinbefore stated, this cultivator consists of two sections or sides, which are composed, mainly, of two separate axles, A A, supported at their outer ends by a pair of wheels, A′ A′, and secured at their inner ends to a pair of vertical stems or standards, A^2 A^2. The inner end of each axle is screw-threaded externally, and screws into a socket on the lower end of its respective stem or standard, and is then pinned and upset, to make the connection firmer.

The two stems or standards A^2 A^2, to complete the usual arch, are connected by a round cross-bar, A^3, which has loose bearings at its ends in sleeves *a*, cast or secured one on the upper end of each stem or standard A^2; and to the center of this cross-bar is secured the draft-tongue A^4, by means of a stirrup or other suitable fastening device.

B denotes one set of plow-beams, having a handle, B′, and composed, as usual, of two bars, *b b*, converging at their inner ends, where

they connect with the axle, and provided at their outer or rear ends with any desired number of cultivating shovels or plows, *b' b'*.

Between the bars *b b* of each set of plow-beams is mounted the mechanism for raising the beams, with their shovels, out of the ground, and for holding the same in any desired position. This mechanism is shown particularly in Figs. 10 to 13, inclusive, and comprises a barrel or casing, C, a spiral band-spring, C', inclosed within the same, and a hollow spindle, C^2, slotted longitudinally at one end and having loose bearings in said barrel or casing at its center. This barrel or casing is composed, preferably, of two detachable parts, one of which is formed with a grooved sheave or eccentric, which leaves its curve and continues out straight, or nearly so, to form a lever, C^3. The spiral band-spring which this barrel or casing incloses is attached at its outer end to or engages with a projection or hook, *c*, on the inner periphery of said barrel or casing, while its inner end is inserted in the slot *c'* of the spindle C^2. This spindle protrudes at one end, and has a collar, C^4, of considerable diameter, and intermediate this collar and the facing side of the barrel or casing C the spindle is made square or of some other angular shape on its exterior, whereby a wrench or a similar tool may be conveniently applied to wind up the spring within the barrel or casing C. The collar C^4 has an annular series of depressions or holes, c^2, within its circumference, for receiving a pin or pins, c^3, to be inserted for holding the spring C' after it has been drawn to the desired tension. The pin or pins c^3 are first passed through one of the flanges *d* of a bridge, D, and are protected by cap *d'*, which together with the entire lifting mechanism is secured to the flanges of the bridge by a bolt, E, passing centrally through said caps and flanges and through the spindle C^2, with a tightening-nut, *e*, on each end. The bridge D has other depending end flanges, which are bolted to the bars constituting one set of plow-beams, and has also a brace, D', bolted to its center and to the handle B' of the plow-beams. A chain, F, is attached to the outer end of the sheave-lever C^3 and to the arch, preferably by means of a hook, *f*, and in this special style of cultivator to a hook secured to a movable side bar, hereinafter to be described. When the handle of the plow-beams is raised, the sheave-lever turns or is carried down and around to the rear by the force of the spring C', and the lifting-power of the chain F increases as the sheave-lever continues its revolution, because the angle of the chain gradually shortens and produces accordingly less strain on the spring, as shown in the diagram Fig. 14, and the movement of this sheave-lever is limited by contact with the bridge D.

The foregoing description relates particularly to the mechanism for and manner of attaching the spring to this particular form or make of cultivator; but it is obvious that the same results could be obtained by mounting the spring upon the arch and attaching the intermediate connections to the plow-beams. The bars *b b*, comprising one set of plow-beams, are bolted at their inner ends to a yoke, G, which connects with the axle by means of a coupling, G'. This coupling is illustrated in detail by Figs. 6 to 9, inclusive, and consists, mainly, of a casting comprising a sleeve, *g*, with right-angle extensions or arms *g' g'*, made cylindrical and hollow. This sleeve *g* is slipped over the axle between the wheel and arch stem or standard, and its ends, which are made flaring or cone-shaped on their interior, fit over bearings on the socket on the lower end of the arch stem or standard and on a set collar, g^2, secured upon the axle by a suitable set-screw. Each of the vertical arms *g'* of the coupling is fitted in an exterior shell, g^3, made, preferably, in two removable sections, secured together upon each arm by a washer, g^4, and set-screw g^5. One section of each shell is provided on its exterior with a vertical row of teeth or cogs, g^6, constituting a rack with spaces to receive keys g^7, for securing the yoke G. This yoke has sockets in its outer ends, whereby it may be slipped over the vertical arms of the coupling G', and has also slots g^8, whereby the yoke may be vertically adjusted by the keys g^7, passed through said slots and between any two of the teeth or cogs g^6 of the shells g^3 g^3. The sleeve *a* on the upper end of each arch stem or standard A^2 is cast or otherwise provided with a pair of downwardly-hanging ears, *h h*, in and between the ends of which is mounted a roller, *h'*, which travels in a rectangular slot, *i*, made in a movable bar, H, which also has movement between the ears *h h* of the sleeve of the arch stem or standard. The rear end of this movable bar H has a hook, *i'*, upon which the plow-beams may be suspended (when elevated) by means of a link on the handle B' of the latter, and the front end of this bar has right-angle extensions or arms H' H'. To the lower arm H' of this bar H is attached a brace, I, extending down to and connecting with the socket on the lower end of the arch stem or standard, another brace, I', extending down to and connecting with the collar or sand-cap at inner end of the hub of the wheel A', or, preferably, with a set-collar, i^2, secured to the same, and a third brace, I^2, connecting with the draft-rods at or near their outer ends. These draft-rods (indicated by J J') are attached, respectively, at their rear ends to the hub of the wheel or collar i^2, and to the socket on the lower end of the arch stem or standard A^2, and extend out horizontally from these points of attachment and come together, forming a hook, J^2, to which the draft-chain is attached. The upper arm or extension H' of the movable bar H has a roller, *k*, which travels in a rectangular slot, *k'*, made in the forward end of a bar, H^2, somewhat similar in

construction to the bar H, and this bar H^2 has loose bearings at its rear end upon the cross-bar A^3 of the arch, accommodated by an opening, k^2, made in the sleeve *a* for this purpose. The bars H^2 on each end of the cross-bar A^3 are connected at their forward ends by a pair of slotted bow-braces, K K, which pass across under and above the draft-tongue A^4, and overlap at their inner ends, as shown in Fig. 4. In this same figure is shown a similar connection of these bars at their rear ends, made by a pair of braces, K′ K′, passing under the draft-tongue. Bolts L L pass through the slots in these braces and through the tongue A^4, and by these connections the independent sections or sides of the cultivator with their several attachments can be adjusted horizontally upon the cross-bar A^3 toward or away from each other, and then secured against movement in a lateral direction.

From the connection of the several parts of this cultivator it will be seen that the two sections or sides of the implement are entirely independent in all respects, and that their several attachments are likewise independent in their various adjustments.

Another advantage is derived from pivoting the arch stem or standard of each section to their connecting cross-bar, in that it dispenses with draft-eveners and allows each horse to act independent of the other without the sawing motion common in cultivators with rigid connections at these points.

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

1. In a wheel-cultivator, the combination, with the arched axle and tongue, of a pair of pivoted plow-beams, a pair of fixed bars, H^2, and a pair of movable bars, H, arranged parallel with the tongue, two sets of draft-rods, J J′, and two sets of connecting-braces, I I′ I^2, pivoted at the upper ends to the movable bars H, substantially as and for the purposes set forth.

2. In a wheel-cultivator, the combination, with the arched axle and tongue, of a pair of bars having loose bearings on the former and connected by a slotted brace or braces made in two sections and secured by a bolt or bolts passing through them and the tongue, substantially as and for the purposes set forth.

3. In a wheel-cultivator, the combination, with the arched axle and tongue, of a pair of parallel fixed bars, a pair of movable bars, and a pair of connecting slotted braces made in two sections with a bolt at the center, passing through the tongue, substantially as and for the purposes set forth.

4. In a wheel-cultivator, and in combination with the plow-beams, a spiral band-spring inclosed within a drum or barrel, a single slotted spindle passing through the same, a recessed collar on one end of the spindle, with means for securing it, and a sheave-lever forming a part of the drum or barrel, all combined and arranged upon the plow-beams, with a chain connecting the lever to the arch, substantially as and for the purposes set forth.

5. In a wheel-cultivator, the combination of the barrel or casing C, having the hook *c* on its interior and the sheave-lever C^3 on its exterior, the inclosed spring C′, the hollow spindle C^2, made square and round, with a slot, *c′*, on one end and a collar, c^4, on the other end, means for securing said collar to prevent the unwinding of the spring, and the bolt E, for mounting the whole, substantially as described, and for the purposes set forth.

6. In a wheel-cultivator, the combination, with the plow-beams, of the yoke G and the coupling G′, composed of a sleeve with a pair of branch arms inclosed each by a shell made in two parts with a rack on one side, substantially as and for the purposes set forth.

7. In a wheel-cultivator, the combination, with the plow-beams, of the yoke G, made open at each end, the coupling G′, with vertical branch arms provided with a rack on one side, and a key for adjusting the yoke upon said arms, in the manner substantially as described.

8. In a wheel-cultivator, the combination, with the plow-beams and the axle, of the coupling G′, having cone-shaped ends to fit over bearings on the arch stem or standard and on a collar upon the axle, substantially as described.

9. In a wheel-cultivator, the combination of a pair of axles, a pair of vertical standards secured to the same, a connecting cross-bar, a sleeve on the upper end of each standard, with a depending pair of ears carrying a roller, a slotted bar moving between said ears and upon the roller, and a fixed bar with a slot in which travels a roller on the outer end of the movable bar, substantially as described.

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

HANS H. SATER.

Witnesses:
WILLIAM GRAHAM,
MONROE M. CADY.