

No. 720,247.

PATENTED FEB. 10, 1903.

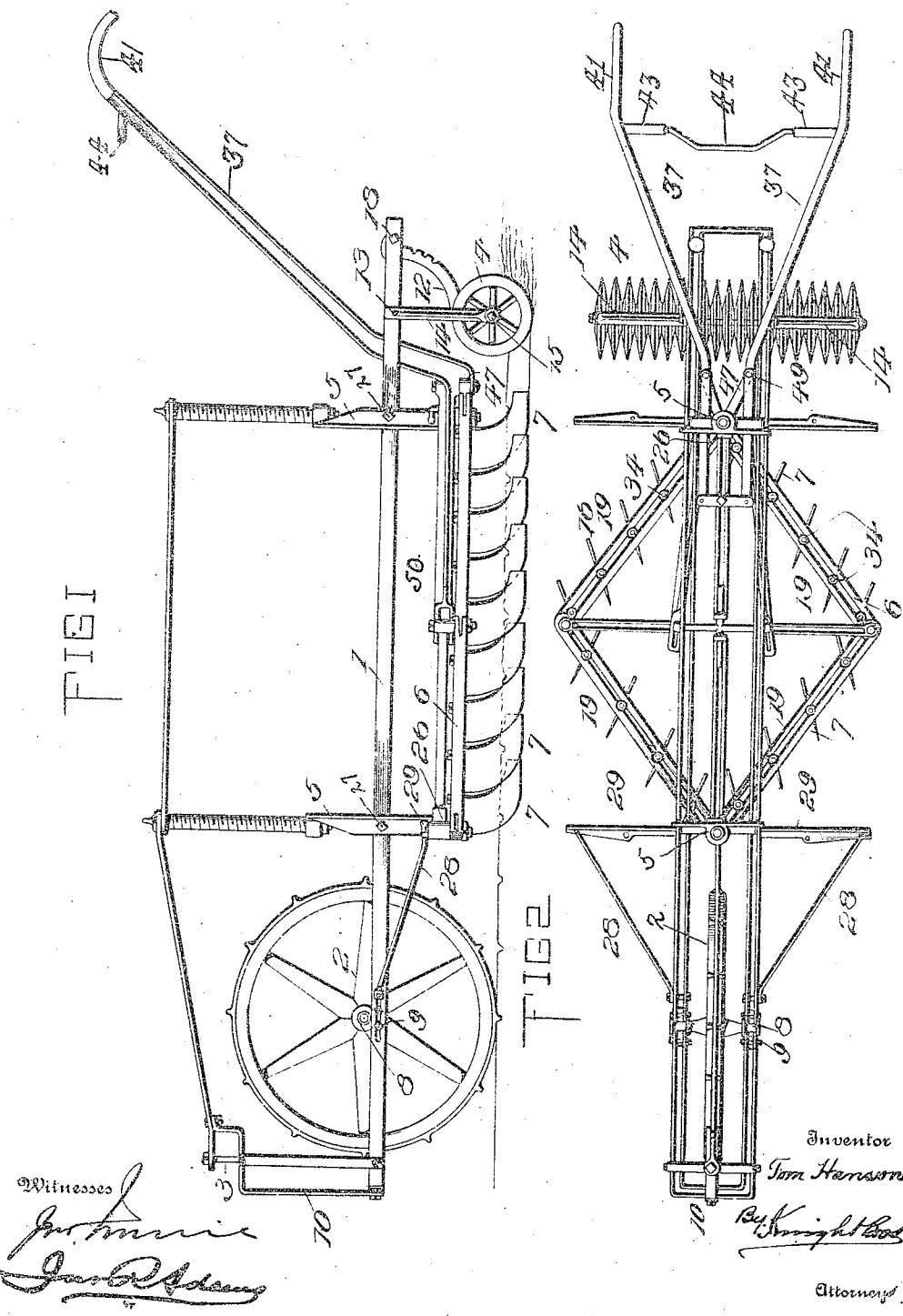
T. HANSON,

CULTIVATOR.

APPLICATION FILED MAY 31, 1901

NO MODEL.

7 SHEETS—SHEET 1.



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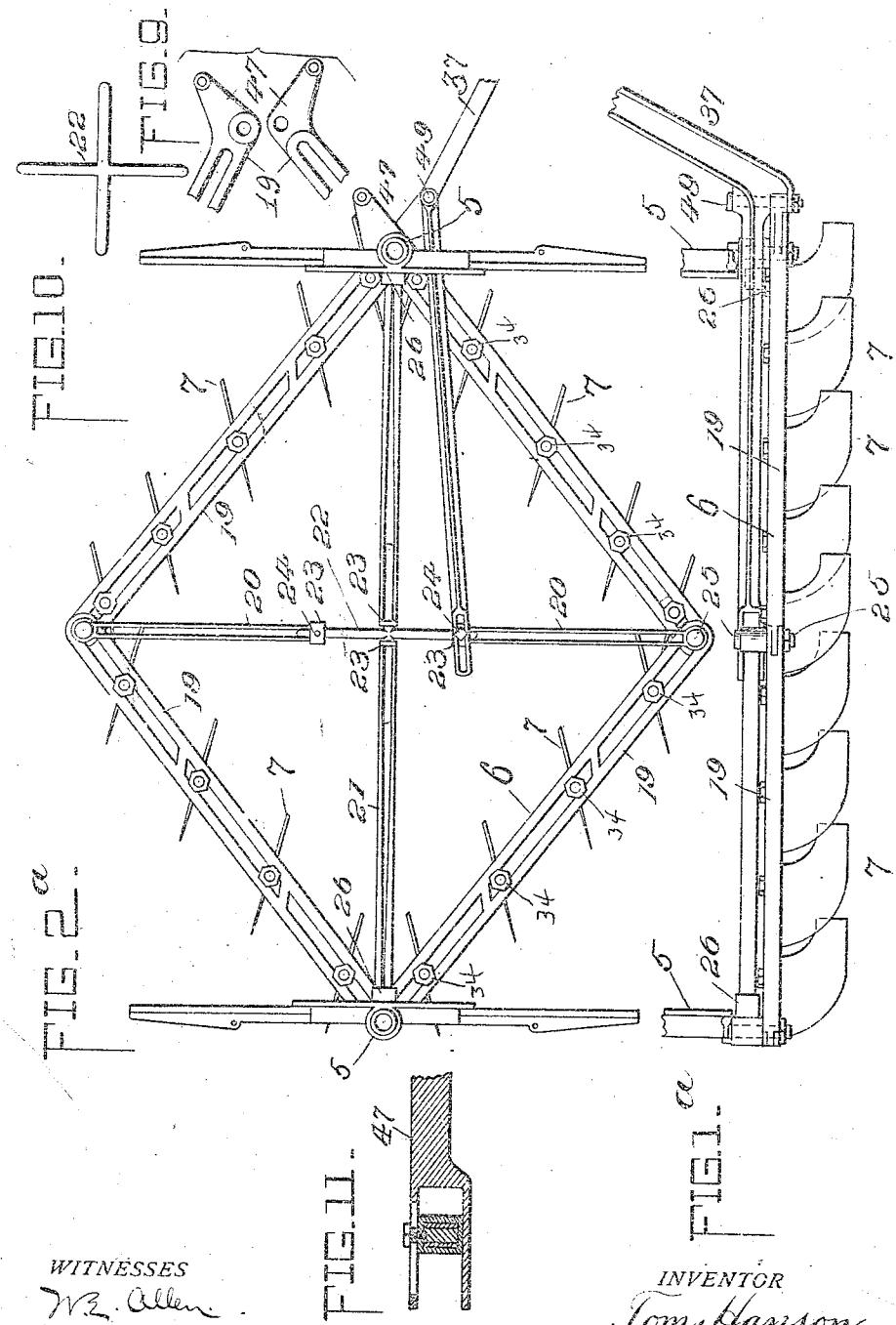
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7 SHEETS—SHEET 2.



WITNESSES

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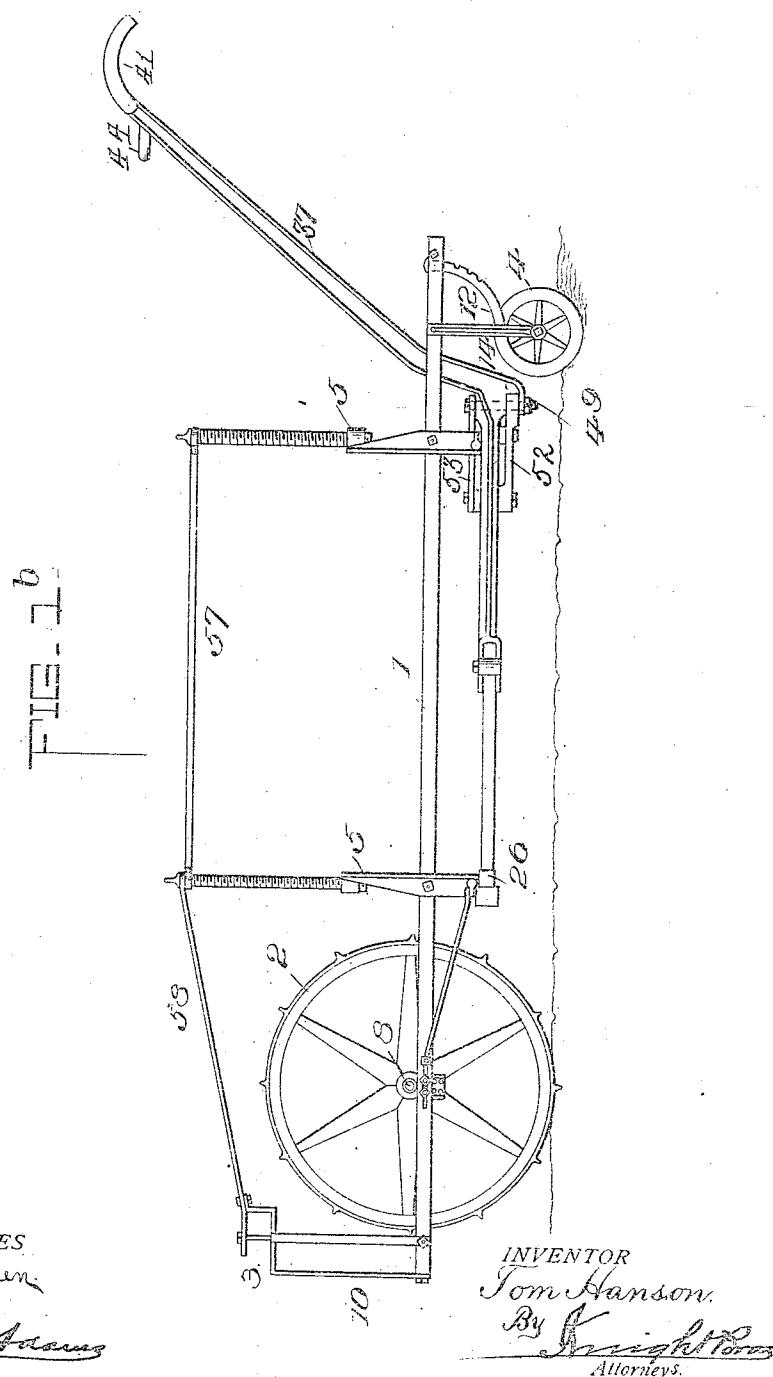
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7 SHEETS—SHEET 3.



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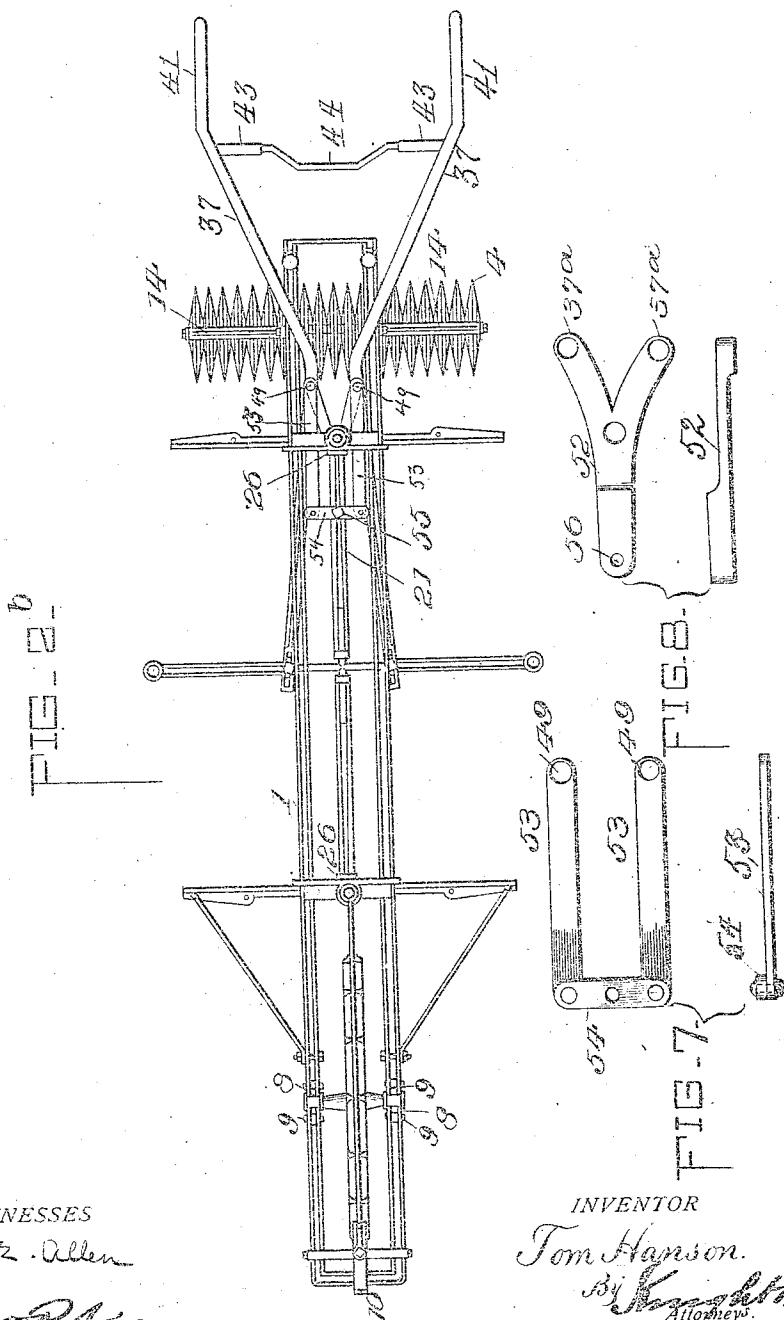
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7 SHEETS—SHEET 4.



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7 SHEETS—SHEET 5.

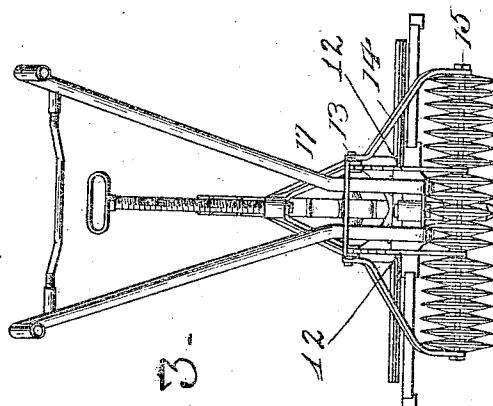
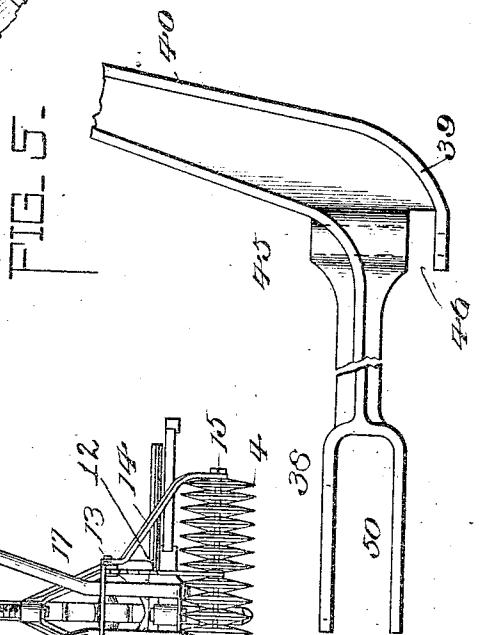
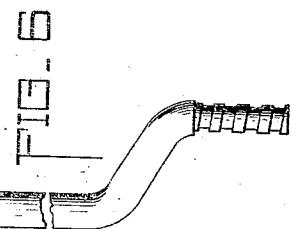
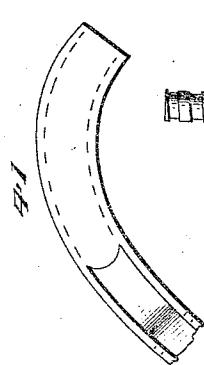
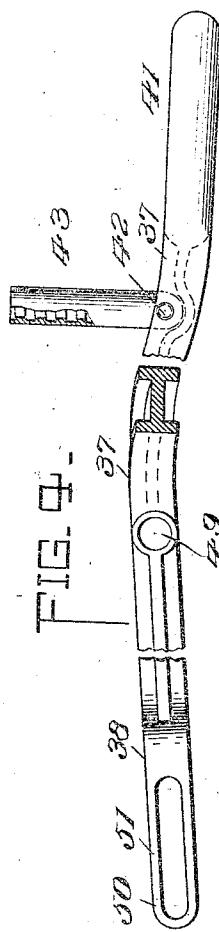


FIG. 3.

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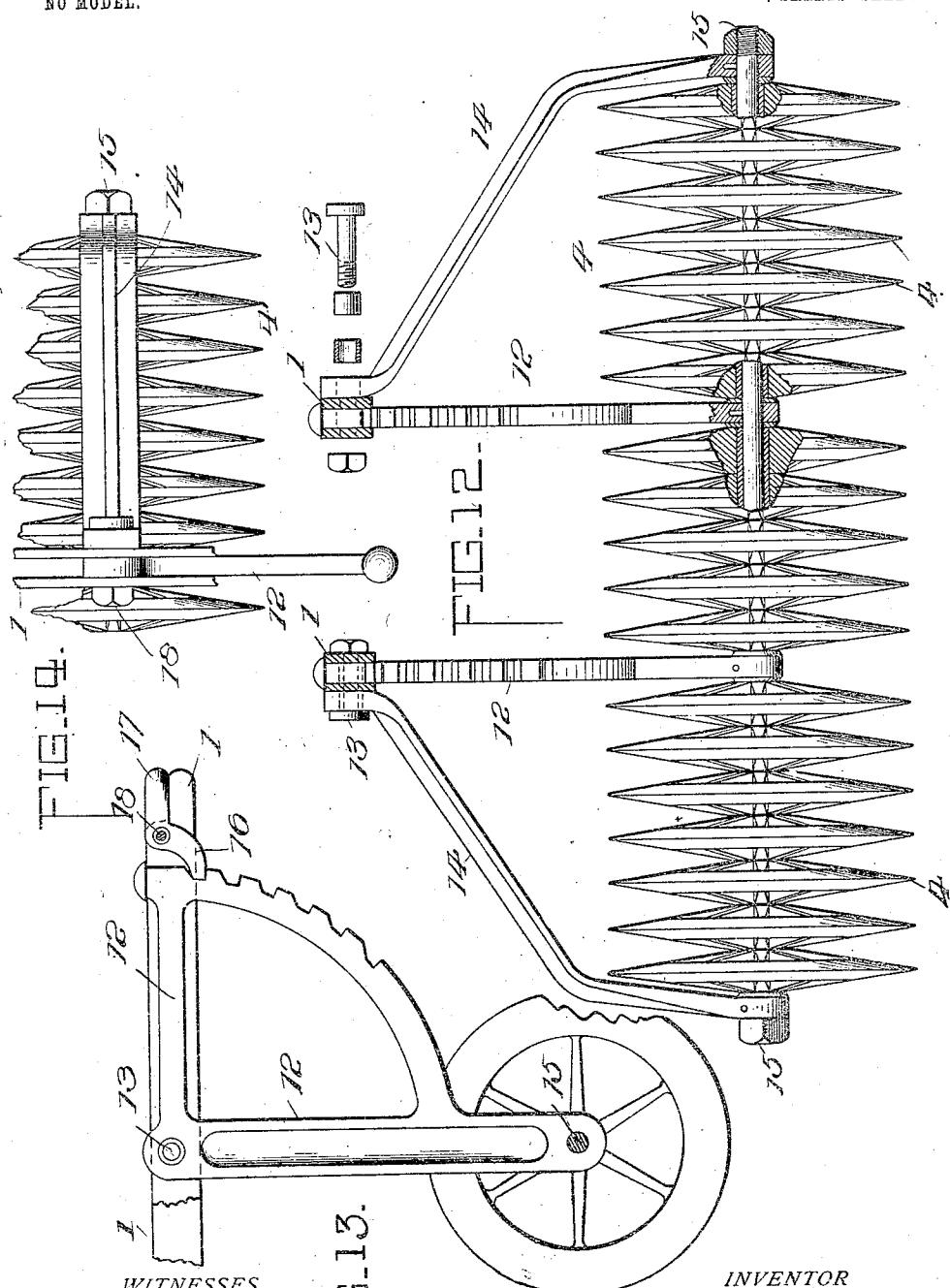
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7 SHEETS-SHEET 6.



WITNESSES

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FIG. 13.

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7 SHEETS-SHEET 7.

FIG.15.

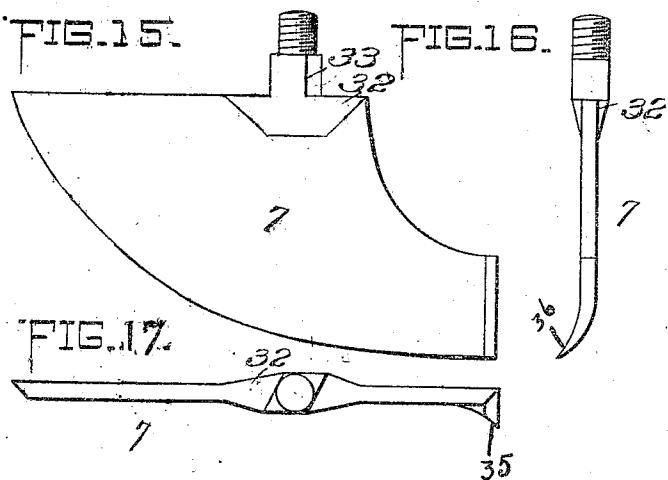


FIG.16.

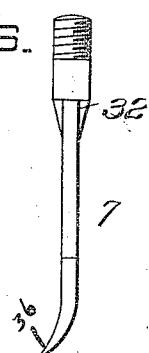


FIG.18.

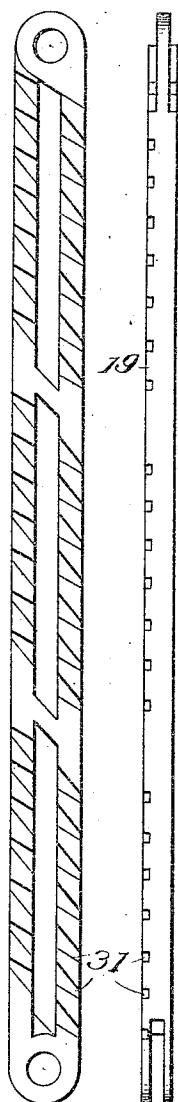


FIG.17.

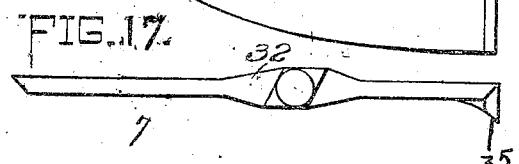


FIG.19.

FIG.20.

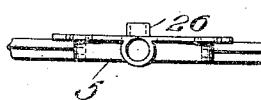
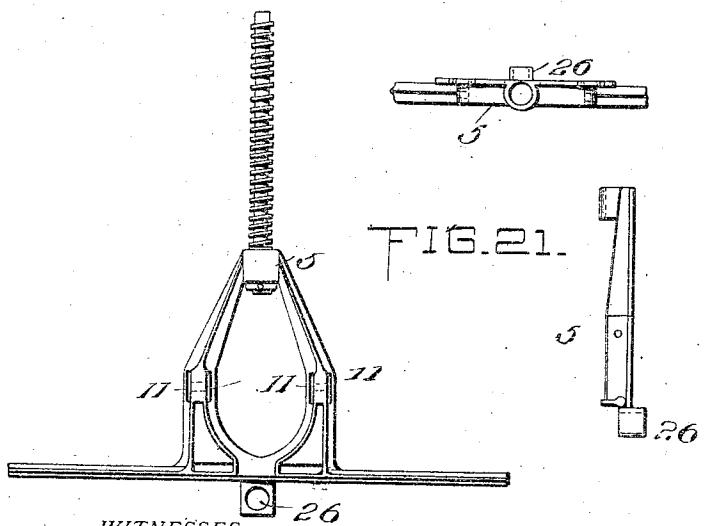


FIG.21.



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UNITED STATES PATENT OFFICE.

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SPECIFICATION forming part of Letters Patent No. 720,247, dated February 10, 1903.

Application filed May 31, 1901. Serial No. 62,584. (No model.)

To all whom it may concern:

Be it known that I, TOM HANSON, a citizen of the United States, residing at Denmark, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Cultivators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

10 My invention relates to an implement for treating the soil between rows of plants, and has for its objects to provide an effective implement for accomplishing the purpose stated.

In carrying out my invention I provide the implement with two sets of soil-treating parts adapted for use either together, in which use one set (pulverizers) pulverize the ground stirred up by the other (stirrers) and regulate the penetration of said stirrers, or for use 20 separately, for which purpose the implement is convertible by having some of its parts interchangeable, whereby the soil may be treated in different specific ways.

My implement is preferably adapted in its 25 structure to have mounted thereon certain novel insect-exterminating mechanism, described and claimed in my application filed June 23, 1898, for which Letters Patent No. 661,739 were issued November 13, 1900.

30 My present improvements are embodied in an implement consisting of a longitudinal frame, a front supporting-wheel, a rear support in the form of wheels or pulverizing-disks, draft appliances, controlling-handles, 35 a specially-constructed four-sided base-frame supported from the longitudinal frame when the wheels are to control the depth of penetration, but adapted for use alone and to receive the controlling-handles when wheels 40 limiting penetration of soil-stirring parts are not desired, said base-frame being expandable through means of the handles and constructed with special reference thereto, improved soil-stirring parts adapted to the base-frame, and 45 certain other novel features of construction, all of which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings, forming 50 part of this specification, Figures 1 and 2 are

respectively a side elevation and a plan of my improvements all embodied in a single implement and including the base-frame and soil-stirring parts carried thereby and the longitudinal frame from which the base-frame is suspended, with the front traction-wheel and rear pulverizing disks upon which it travels and the draft connections through which it is drawn. Figs. 1^a and 2^a are respectively a side elevation and a plan of the base-frame, with its associated parts, in form for use as a cultivator without the longitudinal frame and its accessories. Figs. 1^b and 2^b are respectively a side elevation and a plan of the longitudinal frame and its accessories without the base-frame and soil-stirring parts, but in form for use as a pulverizer. Fig. 3 is a rear view of parts shown in Figs. 1 and 2^b. Figs. 4, 5, and 6 are detail views of the controlling-handles and their adjusting crank-rod which screws in or out in sockets formed upon them, thereby determining the space between the handles and fixing the width of the base-frame. Figs. 7 and 8 are detail views of parts by which the controlling-handles are connected to the rear standard on the longitudinal frame when the base-frame is not used. Fig. 9 is a detail view of the rear joint of the side bars of the main frame and the fulcrums thereon for the controlling-handles. Fig. 10 is a plan of the central cross-rod connection of the main-frame diagonal braces. Fig. 11 is a sectional detail view illustrating the connection between the inner ends of the handles and the diagonal tie rod or brace through which the width of the frame (area covered by the soil-stirring devices) is fixed. Figs. 12, 13, and 14 are detail views of the rear pulverizing and supporting disks and their mounting, by which the soil turned up by the stirring devices of the base-frame is broken up and the penetration of said stirring devices limited, the mounting of the disks being adjustable vertically by a rearward-swinging movement to regulate their height relatively to the soil-stirring devices, and thus determine the depth of the latter's penetration. Figs. 15, 16, and 17 show by side, end, and plan views the form of the soil-stirring devices mounted on the base-frame. Fig. 18 shows by bottom, plan, 120

18, is below and slightly off center in the direction of movement of the said cutter with regard to the pivot on the cutter 17, thereby permitting the cutter 18 to start easily in moving from a state of rest. The range of movement of the cutter 18 is such that when it has reached the limit of its movement the line of the pivots on the cutters will be at a right angle to the length of the stock, and any tendency of either cutter to be forced back into the stock is resisted by the other cutter, as will be seen by reference to Fig. 2, where the tool is shown with the cutters expanded. Each of the cutters is provided with an upper extension having a square shoulder 28, adapted when the cutters are expanded to bear against the upper wall of the slot in which it moves, and the ends of the said extensions are flattened and engage the flat under face of the bar 23, which serves as an abutment therefor. This arrangement insures distribution of the impact, as longitudinal pressure is resisted by the stock forming the upper walls of the apertures 15 and 16 and the pin 23 and lateral pressure of each cutter is resisted through the medium of the link by the other. The abutment-bar 23 alone may be relied on to receive the impact of the blows struck by the cutters; but preferably I make the tool as shown, the cutters having the shoulder 28, designed to engage the upper walls of the slots 17 18. The vertical movement of the cutter 18 is of course limited by the bar 23 and the upper wall of the slot 16.

If desired, the stock may be provided with a shelf or ledge 29, whereon rests an extension 30 of the cutter 17 for assisting in supporting the latter, and this extension, together with an extension 31 at the bottom of the cutter 18, is designed to close the apertures at the bottom thereof when the tool is operating to reduce to a minimum the ingress of dirt and mud or slush into the chamber of the stock and obviate interference with the free movement of the cutters and also to engage the wall of the stock to limit the outward movement of the cutters.

In operating with a tool having but one cutter the stock opposite the cutter is thrown against the side of the shaft or bore and soon becomes ground away. With a double cutter, as shown, the stock is centered in the shaft and held away from its walls, avoiding this objection and lengthening the life of the tool.

In use when the tool passes out of the lower end of the well-casing the spring 22, which is in a compressed state while the tool is passing through the casing, is permitted to expand and in doing so it elevates the yoke, carrying with it the cutter 18. As the blade 18 moves upwardly it is thrust out by the link 19 and reacting on the cutter 17 forces the latter through the slot 15. When the tool is drawn into the well-casing for removal, the front edges of the cutters, which may be bevelled,

as at 32, to facilitate their movement, come in contact with the shoe 11 and are forced into the stock, the cutter being moved back into the position seen in Fig. 1 and compressing the spring through the medium of the yoke 26.

The drill heretofore described is of that character in which water is introduced through the chamber of the drill-stock into the bore in order to free it of the boring-meal. With the ordinary tapping-drill the bar 23 may be dispensed with and no passage for the admission of water being used a block 8, employed in lieu thereof to receive the impact of the blows struck by the cutters and also to support the expanding-spring.

The modified construction is illustrated in Fig. 5, where 33 indicates the drill-stock provided with a threaded boss to receive a cap, (not shown,) to which is adapted to be attached the lifting rope or cable. Secured to the top of the stock by a bolt 34 is a block 35 of the same thickness as the cutters, which latter are similar to those seen in Figs. 1 and 2, and the lower face of this block forms an abutment, against which the upper ends of the cutters bear when expanded in like manner as they engage the bar 23 in Fig. 2. The block 35 is provided with a longitudinal aperture 36, wherein is located an expansion-spring 37, coiled about the central securing-bolt 34. The cross-head 38 of the connecting-rod or yoke 39 has an aperture through which the bolt 34 passes, and the spring 37 reacts between the lower end of the block 34 and this cross-head to elevate the yoke. The construction in all other respects is similar to that heretofore described.

I claim as my invention—

1. In a rock-drill, in combination, a chambered stock having apertures in the opposite walls thereof, expandible cutters housed within the chamber and one of which is movable longitudinally, and a link engaging the cutters and adapted when the latter cutter is moved longitudinally to thrust the cutters through the apertures.

2. In a rock-drill, in combination, a chambered stock having a pair of apertures in the opposite walls thereof, cutters housed within the chamber and adapted to be thrust through the apertures, a link engaging the cutters one at least of which is movable longitudinally, and a spring for moving the longitudinally-movable cutter.

3. In a rock-drill, in combination, a chambered stock having lateral apertures in the opposite walls thereof, cutters, one of which is movable longitudinally, housed within the chamber and adapted to be thrust through the apertures when the longitudinally-movable cutter is elevated, a link engaging the cutters and the point of engagement with the longitudinally-movable cutter being below its point of engagement with the other cutter, an abutment against which the cutters bear when expanded, a connecting-rod pivot-

To give the handles vertical rigidity, the bolts 49 in the latter use also hold in place two rods 53, which extend forward, and, united by the cross-piece 54, which is secured by a bolt 55 to the front end 56 of the Y-shaped piece 52, said bolt 55 passes through the rear longitudinal brace 21.

57 58 are braces which extend from the top of the standards to the draft attachment 3.

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

1. In an agricultural implement, the combination of a four-sided base-frame having its 15 sides jointed at the angles and collapsible in the direction of a diagonal, means for fixing it at any position which it may be made to assume, and mechanism for moving all sides of the base-frame simultaneously to vary its 20 width.

2. In an agricultural implement, the combination of the frame made up of four sides jointed together, braces secured at the four 25 corners of the frame and extending toward the center of the frame and terminating in collars, and the rigid cross-shaped piece having arms working in said collars, and mechanism connected with said collars for varying the width of the frame, substantially as and 30 for the purpose set forth.

3. In an agricultural implement, the combination of the four-sided base-frame having draft connections for moving it in the direction 35 of a diagonal, collapsible in the direction of a transverse diagonal, and having braces extending from its side angles toward its center, and the handles fulcrumed at the rear angle of the frame and having forward extensions connected with the braces, for the 40 purpose set forth.

4. In an agricultural implement, the combination of the diamond-shaped main frame, collapsible laterally and having inwardly-projecting braces, and the handles secured to 45 the rear ends of the side members of the frame and extending forward and secured to the cross-braces by longitudinally-adjustable connections, substantially as and for the purpose set forth.

5. In an agricultural implement, the combination of the four-sided collapsible base-frame, the adjustable brace extending transversely of said main frame, rear projections 55 on said main frame, and handles fulcrumed at intermediate points to the rear projections and having their ends secured to the cross-braces whereby the handles may control the width of the base-frame, substantially as and for the purpose set forth.

6. In an agricultural implement, the combination of the main frame, the cross-braces, the handles secured at intermediate points of their length to the end of the main frame, and projecting forward and terminating in 65 bifurcated ends which embrace the cross-braces, and of which bifurcated ends, the upper forks are slotted longitudinally, and se-

curing-screws passing through the slots of said forks and into the cross-braces, for the purpose set forth.

7. The combination of a collapsible frame, handles secured to the frame, and mechanism carried by the machine for moving the handles to vary the distance between them to collapse or expand the frame.

8. In an agricultural implement, the combination of a four-sided frame having its sides jointed at the angles, and collapsible in the direction of its diagonals, and handles secured to the two rear sides of the frame and collapsing or expanding the frame upon the varying of the distance between them.

9. In an agricultural implement, the combination of a four-sided frame having its sides jointed at the angles and collapsible in the direction of its diagonals, handles connected with the frame, and mechanism carried by the implement for moving the handles to vary the distance between them to collapse or expand the frame.

10. In an agricultural implement, the combination with a main frame, and a four-sided collapsible base-frame traveling in the direction of the diagonals, of mechanism adapted to be operated to collapse or expand the base-frame.

11. The combination of a four-sided collapsible base-frame carrying soil-stirring parts, and a frame from which said base-frame is suspended.

12. The combination of the four-sided collapsible base-frame, carrying soil-stirring parts, and the longitudinal U-shaped frame from which the main frame is suspended, and upon which are mounted the front wheel and 105 the rear pulverizers, substantially as set forth.

13. In an agricultural implement, the combination of a wheeled main frame, and a four-sided collapsible base-frame traveling in the direction of one of its diagonals, suspended 110 detachably from said main frame, and carrying soil-stirring parts.

14. The combination of a four-sided frame, soil-stirring parts carried by the four-sided frame, and vertically-adjustable pulverizers 115 mounted at the rear of the soil-stirring parts.

15. In an agricultural implement, the combination of the longitudinal frame, carrying a front wheel and suitable draft appliance, the four-sided collapsible base-frame suspended from the longitudinal frame, and carrying soil-stirring parts, and the vertically-adjustable pulverizing-disks mounted on the rear end of said longitudinal frame.

16. In an agricultural machine, the combination with a wheel, of two U-shaped bars, and bearings for the wheel, bolted between the bars.

17. In an agricultural implement, the combination of the longitudinal frame provided with a draft appliance, the standards on said longitudinal frame projecting above and below the same, the base-frame suspended from the lower ends of the standards and carrying

soil-stirring parts, and a brace extending from the upper parts of the standards to the draft appliance.

18. In an agricultural implement, the combination of the longitudinal frame, the standards secured upon said longitudinal frame and provided with sockets at their lower ends the longitudinal brace-rods secured in said sockets and projecting toward each other, and the base-frame carrying soil-stirring parts, connected at its ends with the standards and having transverse brace-rods, and means for connecting the ends of all the brace-rods at the center of the machine, substantially as and for the purpose set forth.

19. In an agricultural implement, the combination of the four-sided base-frame having a draft appliance which causes it to travel in the direction of one of its diagonals, and having the under faces of its side bars formed with angularly-disposed seats, and soil-stirring parts secured in said seats; the soil-stirring parts on the rear side bars being disposed at an angle to those on the front bars, substantially as and for the purpose set forth.

20. In an agricultural implement, the combination of the side bars forming the frame and provided with diagonal recesses on their under sides, and the soil-stirring parts having square shanks projecting into openings in the bars, and means for securing said soil-stirring parts to the bars, substantially as and for the purpose set forth.

21. In an agricultural implement, the combination of the collapsible frame, handles pivoted at intermediate points of their length and extending forward across said frame, braces connected to said frame and with said handles, and means for adjusting the distance of the handles apart for the purpose of changing the width of the frame, substantially as and for the purpose set forth.

22. In an agricultural implement, the combination of the base-frame, made up of four

side bars having their ends hinged together 45 and provided with braces and with rear projections, the handles pivoted at intermediate points upon said rear projections, and having ends projecting forward and making connection with the braces, and the adjusting 50 crank threaded in the rear ends of the handles, for the purpose set forth.

23. In an agricultural implement, the combination with the longitudinal frame, a wheel and rear pulverizers; of the floating base-frame suspended from the longitudinal frame and carrying soil-stirring parts; and means for raising and lowering the rear pulverizers to regulate the penetration of the soil-stirring parts, consisting of the bell-crank frame 60 carrying the rear pulverizers, fulcrumed at its angle, a segmental rack secured at each end to the bell-crank frame, and a securing-dog engaging the segmental rack.

24. The combination of a four-sided collapsible frame traveling in the direction of one of its diagonals, soil-stirrers mounted on the side bars of the frame, the stirrers on the front side bars being arranged to deflect the soil inwardly and the stirrers on the rear 70 sides being arranged to deflect the soil outwardly, and mechanism carried by the implement for collapsing or expanding the frame.

25. The combination of a four-sided frame 75 traveling in the direction of one of its diagonals, each side bar of which is provided upon its under side with angularly-disposed seats, and soil-stirrers provided with bosses which fit in said seats.

26. The combination of a main frame, standards horizontally adjustable thereon and a collapsible frame suspended from the main frame by the standards.

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Witnesses:

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