No. 651,092. Patented June 5, 1900.

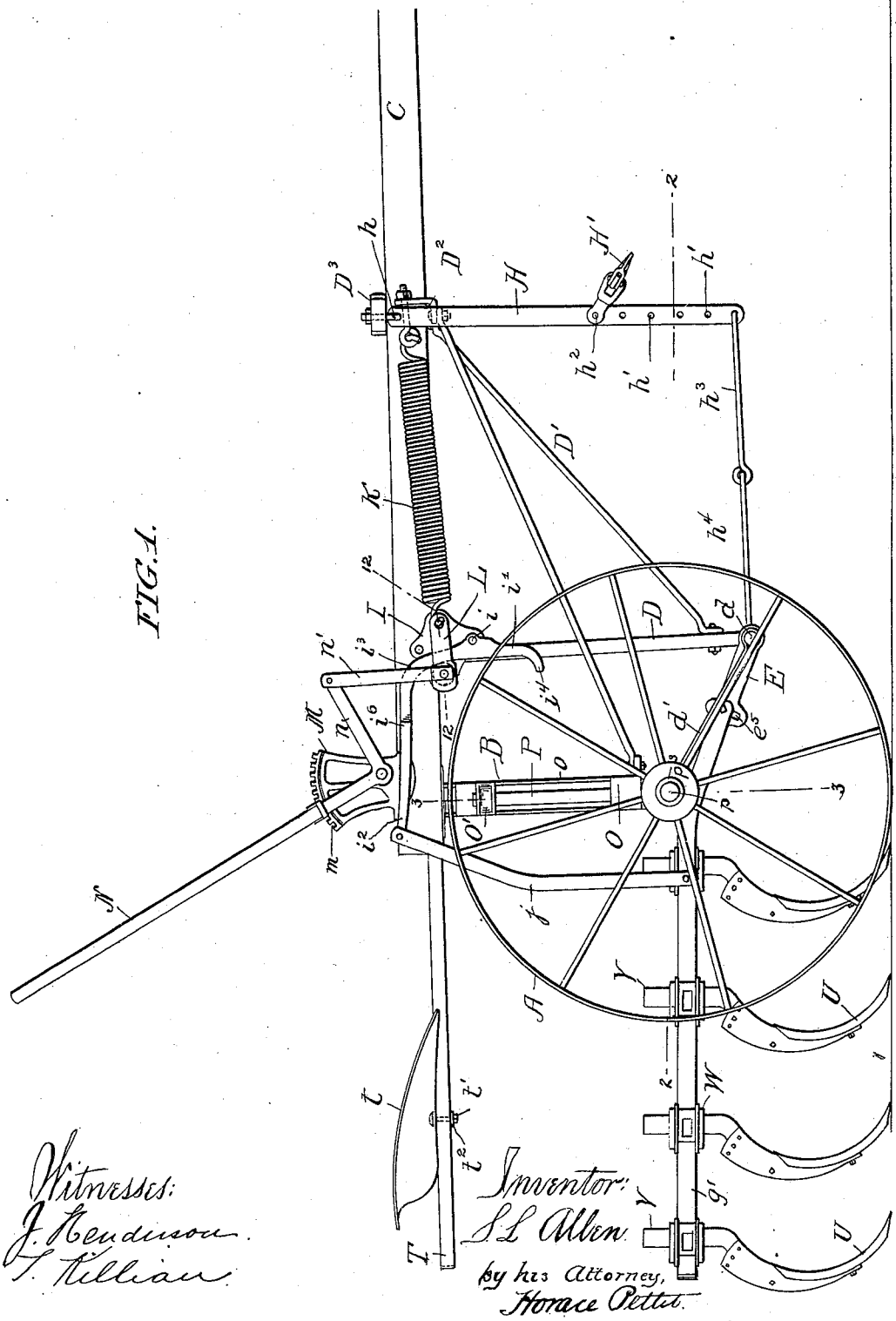
S. L. ALLEN.

AGRICULTURAL IMPLEMENT.

(Application filed July 13, 1897.)

(No Model.) 7 Sheets—Sheet 1.

FIG. 1.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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FIG. 2.

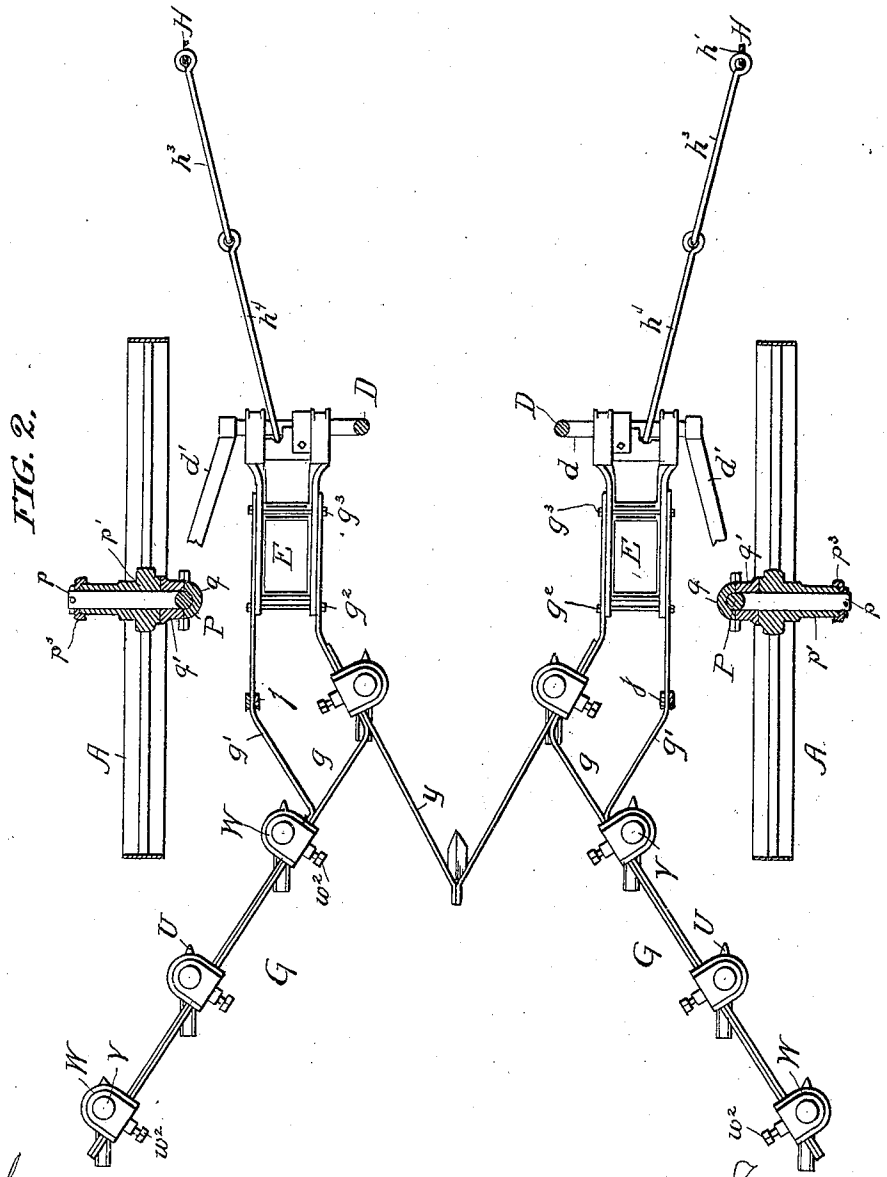

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FIG. 3.

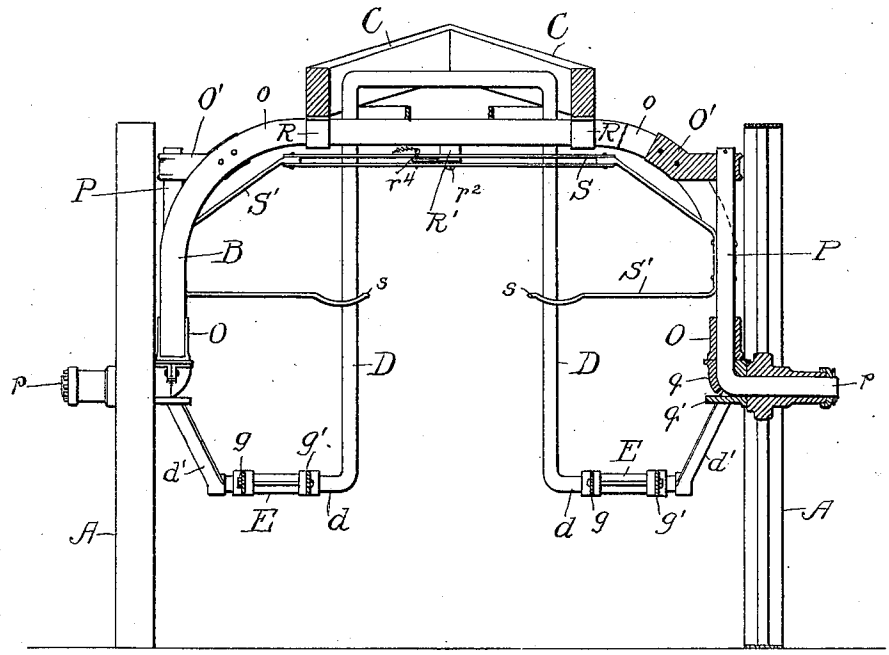

FIG. 13.

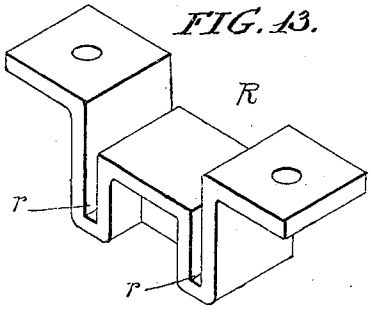

FIG. 14.

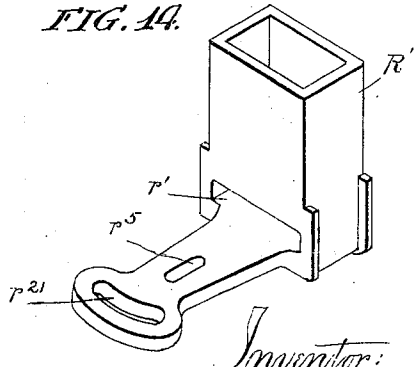

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FIG. 4.

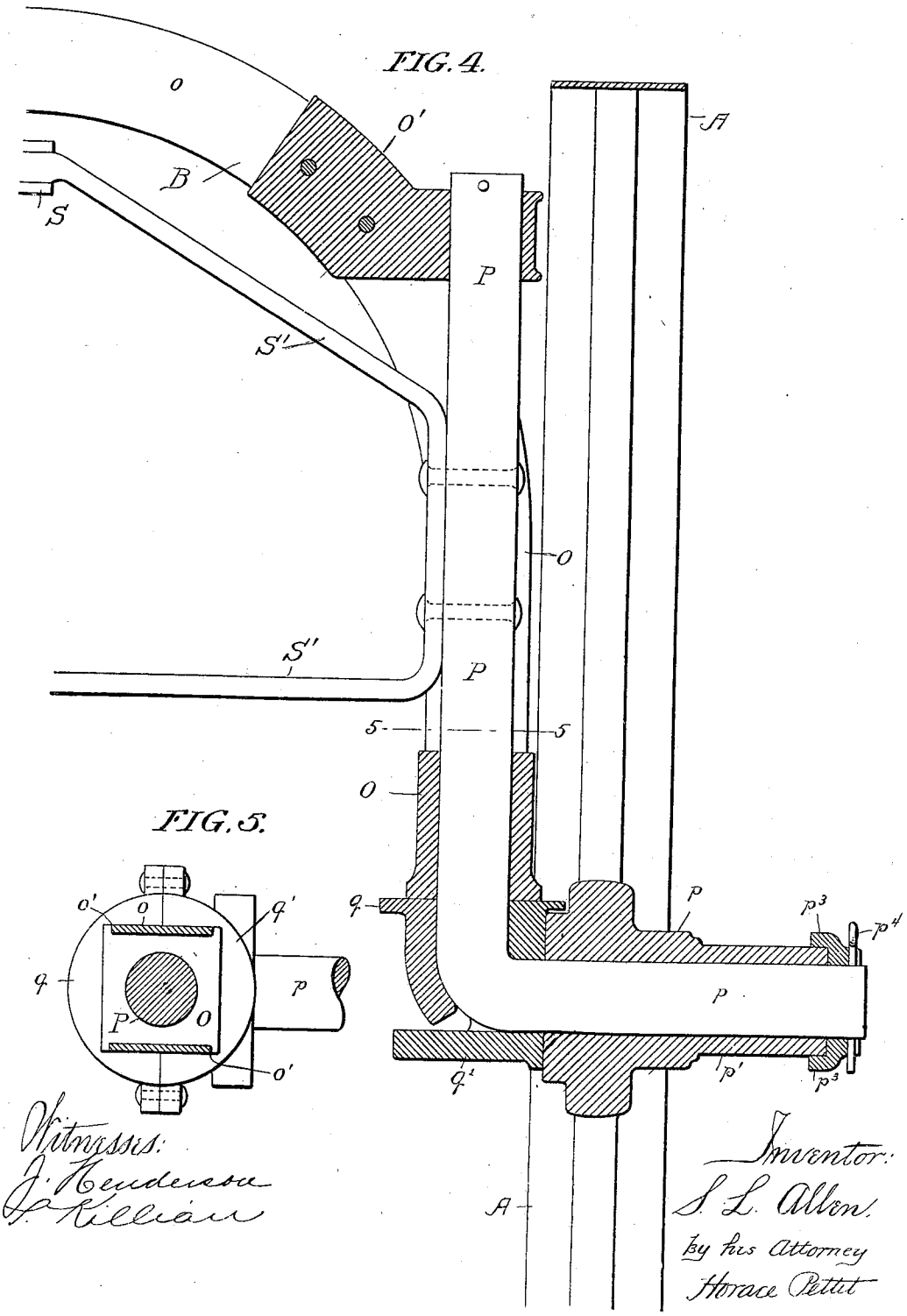

FIG. 5.

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(No Model.) 7 Sheets—Sheet 5.

FIG. 6.

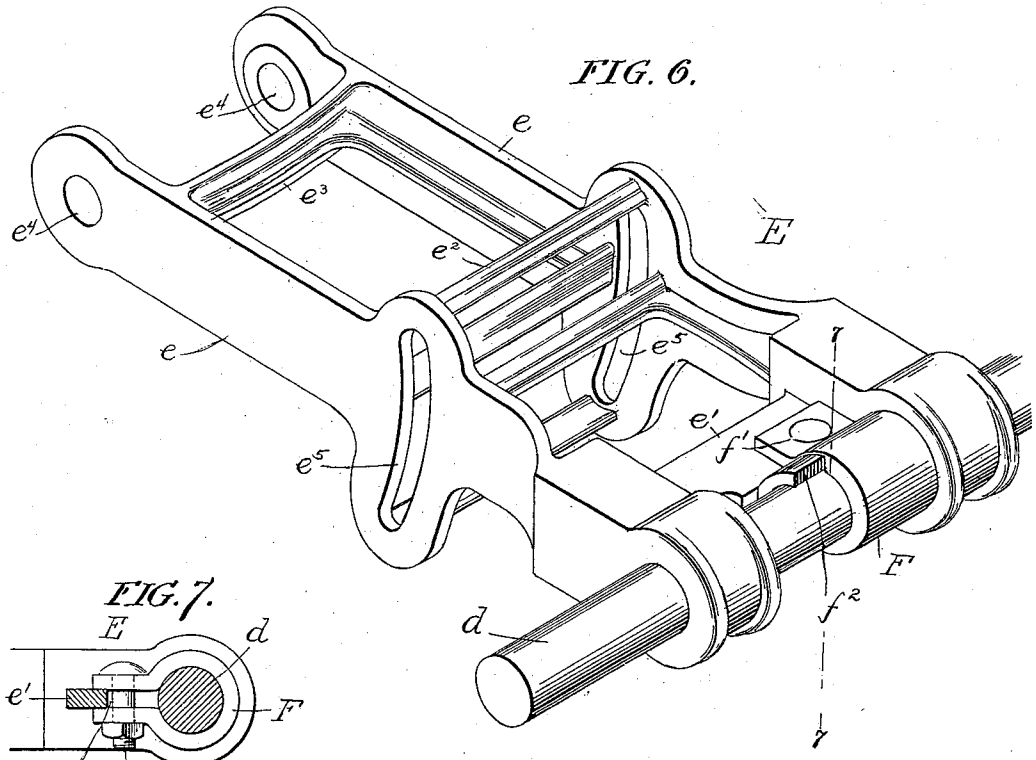

FIG. 7.

FIG. 11.

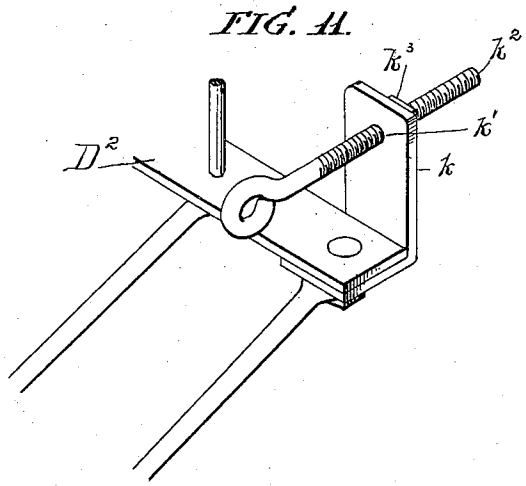

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FIG. 8.

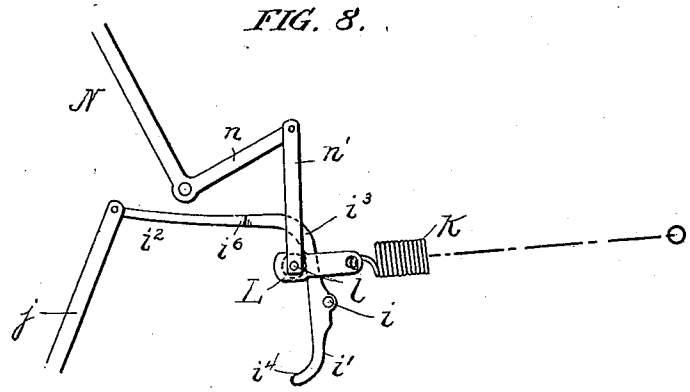


FIG. 9.

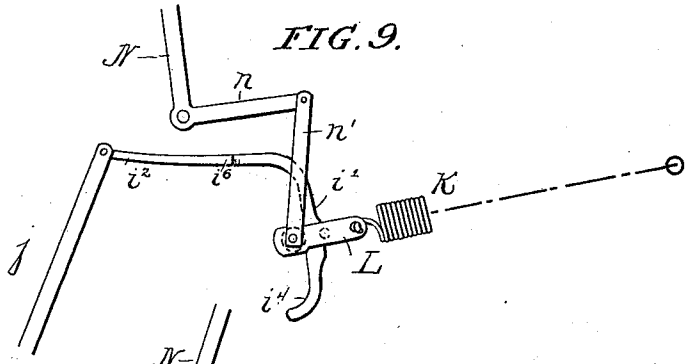


FIG. 10.

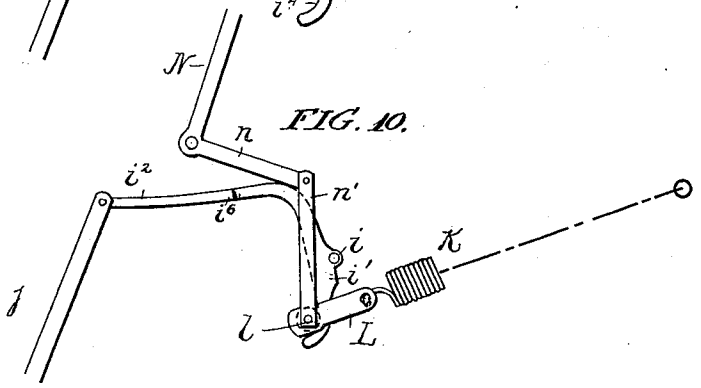
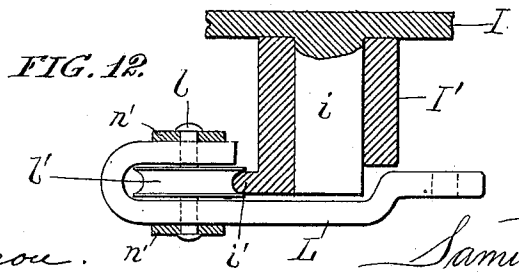


FIG. 12.



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(No Model.) 7 Sheets—Sheet 7.

FIG. 15.

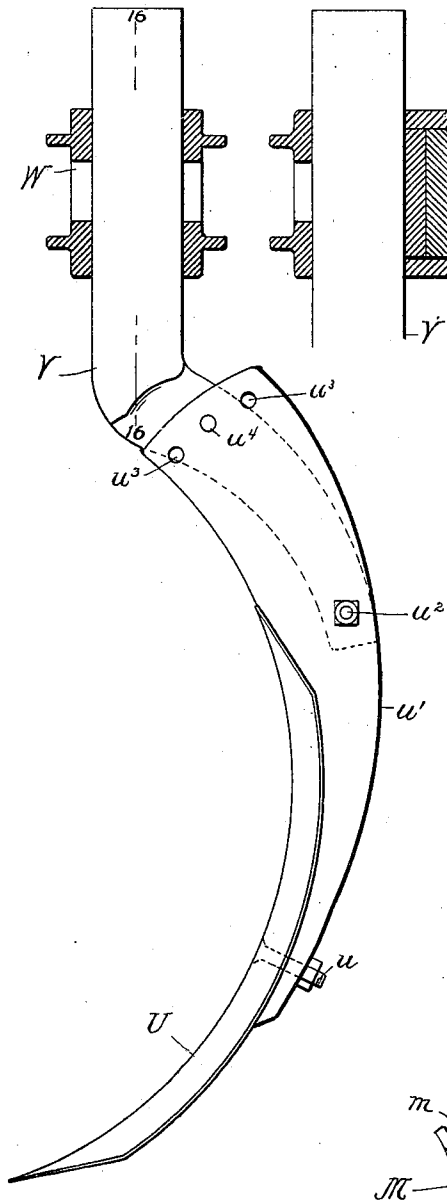
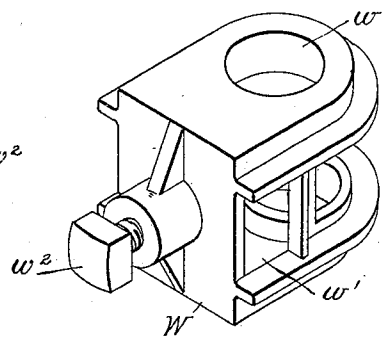


FIG. 16.

FIG. 17.



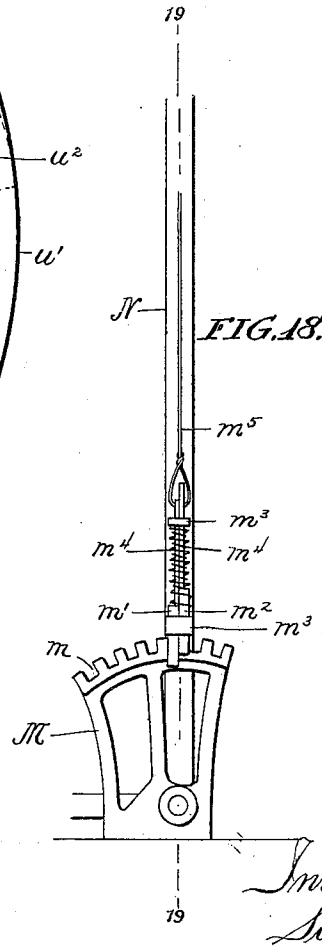
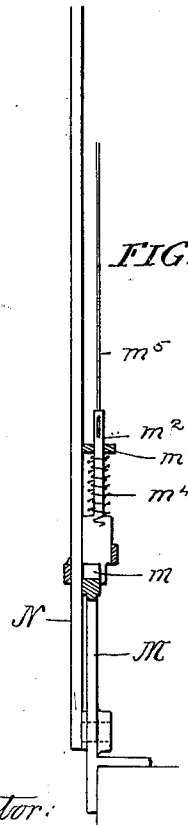


FIG. 18.

FIG. 19.



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UNITED STATES PATENT OFFICE.

SAMUEL L. ALLEN, OF MOORESTOWN, NEW JERSEY.

AGRICULTURAL IMPLEMENT.

SPECIFICATION forming part of Letters Patent No. 651,092, dated June 5, 1900

Application filed July 13, 1897. Serial No. 644,401. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL L. ALLEN, a citizen of the United States, and a resident of Moorestown, State of New Jersey, have invented certain new and useful Improvements in Agricultural Implements, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain improvements in agricultural implements and has for one object to provide an improved form of horse-machine which will enable the operator to accomplish almost every kind of work possible in the cultivation of crops.

A further object of my invention is to provide for the regulation of the pressure exerted to force the cultivator-teeth into the ground and adjust the tension in accordance with the character of the soil, and to govern and adjust the position of the teeth by means of a single operating-lever upon each side of the implement.

A still further object of my invention is to so construct the teeth-holding frames that they will be perfectly rigid and may be adjusted both vertically and laterally for different classes of work.

A still further object of my invention is to provide for the ready adjustment of the teeth on the frames so that furrows may be made at any required distances from each other.

A still further object of my invention is to improve the construction of the guiding mechanism for the supporting-wheels, the wheel-pivots being arranged close to the wheels, so that great freedom and rapidity of movement may be attained.

Further objects of my invention are to provide for a low draft of the tooth-holding frame, to improve the construction of the frame and provide for its ready adjustment, and generally to improve, simplify, and cheapen the construction of the machine, as more fully set forth hereinafter.

In the accompanying drawings, Figure 1 is an elevation of an agricultural implement constructed in accordance with my invention. Fig. 2 is a sectional plan view of the same on the line 2 2, Fig. 1. Fig. 3 is a rear elevation of the machine, partly in section, on the line 3 3, Fig. 1. Fig. 4 is a sectional elevation, on an enlarged scale, of a portion of the mechanism illustrated in Fig. 3 and showing more clearly the construction of the wheel-hub and its pivotal support. Fig. 5 is a sectional plan view on the line 5 5, Fig. 4. Fig. 6 is a detail view of the forward end of one of the tooth-carrying frames. Fig. 7 is a transverse sectional elevation on the line 7 7, Fig. 6. Figs. 8, 9, and 10 are detailed views in the nature of diagrams illustrating some of the positions to which the tension-spring and the levers of the teeth-carrying frame may be adjusted. Fig. 11 is a detail perspective view of the adjustable support for the forward end of the tension-spring. Fig. 12 is a sectional plan view, on an enlarged scale, on the line 12 12, Fig. 1. Fig. 13 is a detached perspective view of one of the clamps for connecting the arched wheel-carrying frame to the yokes. Fig. 14 is a detached perspective view of the pivot-block by which the steering mechanism is carried. Fig. 15 is a sectional elevation of one of the cultivator-teeth and its carrying-clamp. Fig. 16 is a transverse sectional elevation of the same on the line 16 16, Fig. 15. Fig. 17 is a detached perspective view of one of the teeth-carrying clamps. Fig. 18 is an elevation illustrating one of the catches for the operating-levers, and Fig. 19 is a sectional elevation of the same on the line 19 19, Fig. 18.

Referring to the drawings, A represents the supporting and guiding wheels, carried by an arched frame B, which latter is attached to the rear end of the longitudinal bars C of the upper frame. At a point some distance forward of the frame B is a yoke-like bar D, secured at its upper end to the longitudinal bars C, which it serves to space and brace. At a point near the lower end of this bar are secured bracing-bars D′, extending from thence to a transverse bar D^2, which connects the opposite side bars of the frame and acts partly as a support for the main single-tree D^3. The lower ends of the bar D are bent at right angles and project outwardly in the form of pivot-bars *d*, their extreme outer ends being braced by bars *d*′, connected at one end to the frame B and at their opposite ends to the pivot-bars *d*. On the pivot-bar *d* is pivoted a frame E of the construction more clearly illustrated in Fig. 6 and comprising opposite side bars *e*, connected at

intervals by integral cross-bars e' e^2 e^3 and having at their rear ends openings e^4 for the passage of the pivot-bolt of the tooth-carrying frame referred to hereinafter. These side bars e are also provided with segmental slots e^5, through which may pass an adjusting-bolt g^3, carried by the extreme forward ends of the gang-frames and permitting vertical adjustment of the latter to a considerable extent, the bolt g^3 being tightened when the desired adjustment has been effected and holding the gang-frames securely in place.

In the forward end of the cross-bar e' at points between the side bars e are formed openings or recesses f, through which may pass a securing-bolt f', carried by a clamp F, which surrounds the pivot-bar d, the clamp and the frame E being adjustable laterally on the pivot-bolt and being locked in any desired position by the tightening of the bolt f'. Any independent lateral movement of the frame E is prevented by the contact of the clamp on one side with the side bar e and on its opposite side by a finger f^2, formed integral with the bar e', from which it projects and partly embraces the pivot-bolt d. The lateral adjustment which may be effected by the construction described permits of the use of the machine between furrows of any width, and the vertical adjustment of the gang-frames permits of a considerable change in the angle and position of the cultivator-teeth, plows, or other tools which are carried by the gang-frame.

To each frame E is secured a gang-frame G, formed of two flat strips g g' of wrought-steel, which at their rear ends are in close contact with each other and at their forward ends are so bent as to form a rigid structure, the angles of bending being so arranged that any lateral strain will be taken up and the rigidity of the frame insured. The gang-frame is pivoted to the frame E by a bolt g^2 and at its forward end carries a bolt g^3, which passes through the slots e^5 of the pivot-frame E. As the bars g g' are on opposite sides of the frame E and are secured and clamped at two points to said frame, the gang-frame will be rigidly held in place.

The singletree D^3 is pivoted centrally to the connecting-bar D^2 and extends for some distance beyond the sides of the longitudinal bars C and is provided near its opposite ends with eyebolts h, to which are hung draft-bars H, provided near their lower ends with a series of openings h', to any one of which may be secured the bolt h^2 of the doubletrees H', while to the extreme lower end of the bar or to any one of the openings h' is secured a link h^3, connected at its opposite end to a link h^4, extending from the pivot-bolt d, the point of connection between the link and the pivot-bolt being preferably between the finger f^2 and one of the side bars e of the frame E, so that the draft will be exerted directly upon the teeth-carrying frame. It will be noted that the draft connection is extremely low and the tendency of the pulling force will be exerted in a direct line and will tend to depress the teeth rather than elevate them, as would be the case if the draft connection were above the level of the tooth-carrying frame.

On the outer sides of the bars C are secured plates I, from which project stud-shafts i, which may be formed integral with the plates. On these studs are pivoted levers I', each lever having two arms i' i^2 curved at i^3 at the juncture of the two arms, and the lower end of the arm i^4 being curved to form a stop for limiting the range of movement of the tension-spring. The rear end of the arm i^2 is connected by links j to the bar g' of the teeth-carrying frame, so that any movements of the lever are immediately transmitted to the tool-carrying frame and the desired vertical adjustment of the latter may be thus effected.

To each end of the cross-bar D^2 is secured an arm k, provided with an opening k', through which passes the threaded stem of an eyebolt k^2, and such threaded stem is provided with an adjusting-nut k^3, which may be turned to adjust the tension of a spring K, one end of which is secured to the eyebolt k^2. The opposite end of the spring K is secured to a plate L, having its rear end bent in yoke form, as shown in Fig. 12, in such manner as to partly embrace the lever I' and to form a support for the shaft l of a roller l', which is adapted to travel on a trackway formed on the rear face of the arm i' of the lever I'.

On each of the bars C is secured a small frame M, having a curved upper face in which are formed a series of holding-notches m, adapted to coact with a pair of locking-bolts m' m^2, carried by a lever N, pivoted to the frame M, and to hold said lever in any position to which it may be adjusted. The locking-bolts m' m^2 are adapted to guides m^3, carried by the lever N, and each has a separate spring m^4, by which it is forced into contact with the frame M or its notches m, the arrangement being such that one or other of the bolts will always be in engagement with one of the holding-notches and its fellow will be in contact with the surface of the frame, and thus gain the same effect of number of possible lockings as though the frame were twice as large, and, in combination with a single locking-bolt, had twice the number of notches. The upper end of each bolt is recessed for the reception of a rod or wire m^5, by which either or both may be raised from engagement with the notches m. Secured to or formed integral with the lever N is an arm n, having its outer end connected by links j' to the plate L, preferably by the pivot-shaft l of the roller l'.

The operation of this portion of the mechanism is as follows: When the parts are in positions illustrated in Figs. 1 and 8, with the roller l' in contact with the lever I' at a point above its pivot i, the tendency of the spring is to elevate the arm i^2 and, through the links j, reduce the weight of the teeth-carrying

frame on the ground, and consequently to reduce the depth of work till exactly suited to the ground or to the wishes of the operator, and if the lever N be drawn back until the roller l' is in contact with the curved portion of the lever I' the teeth will be raised clear of the ground and permit the free travel of the machine to and from the field of operation. When the lever N is moved in such manner as to bring the roller l' to a point directly opposite the pivot i the tension-spring will exert no force whatever upon the lever I' and the cultivator-teeth will be held in the ground merely by their own weight, added, of course, to the weight of the carrying-frame. This is desirable for work in medium soil or where the penetration of the teeth is comparatively easy. In heavy soil or where deep furrows are desired the lever N is so adjusted as to move the roller l' to the position illustrated in Fig. 10, in which case the tension of the spring will exert a downward pressure on the teeth-carrying frame through the arm i^2 and the links j and will keep the teeth in constant contact with the ground, at the same time permitting the raising of the teeth when they strike a rock or other obstruction, and so avoid breaking or straining of any of the parts. If a rock or other obstruction be met with and the teeth raised from the ground, the tension-springs will immediately force the teeth into the ground. As soon as the obstruction is passed the work is instantly resumed.

The range of movement of the lever N is limited in one direction by the stop i^4, with which the roller l' comes in contact, and in the opposite direction by a stop i^6, projecting from one or both sides of the arm i^2 and arranged to come into contact with the links n' when the lever N is drawn fully backward.

The axles of the supporting-wheels and the top bars C are connected by an arched frame B, formed of two flat strips o of wrought-iron separated by a number of spacing-blocks, which also serve as a means for connecting the frame to the upper bar C and to the axle-pivot. In order to gain the greatest strength, the bars o are curved or arched in their width and at their lower ends and sides are connected by blocks O O', in which are swiveled vertical bars P, the lower ends of which are bent outwardly at a right angle to form axles for the reception of the hubs p' of the supporting and guiding wheels A. At that point on each of the pivot-bars where the binding takes place the pivot is surrounded by a two-part box $q\,q'$, the upper face of which supports the weight of the machine and forms a bearing on which the lower face of the block O may turn. In order to place the pivot P close to the wheel-hub without sacrificing the bearing-surface of the hub upon its support, the meeting faces of the hub p' and the portion q' of the clamp are faced off and accurately fitted to each other in such manner as to form a vertical bearing capable of sustaining considerable side thrust and acting to replace the horizontal bearing, which would be formed normally by the inwardly-projecting portion of the hub. The outer portion of the hub is somewhat elongated and is held in place by a collar p^3, fastened in position by a pin p^4, which extends through the axle p. The blocks O O' are somewhat wider than the bars o and are recessed, as shown at o', Fig. 5, for the reception of such bars.

The upper portions of the frame are connected to the horizontal bars C by blocks R of the character more clearly shown in Fig. 13, each block being provided with recesses r, which serve to space and hold the bars of the frame in proper position.

Secured centrally between the bars of the frame is a box or block R' of the character more clearly shown in Fig. 14. This block extends to some distance below the bars of the frame and carries two parallel bars S, one of which passes through an opening r', formed in the lower portion of the block R', and the lower bar extending under the block R'. These two bars are pivoted at r^2 to the block and at their outer ends are pivotally connected to steering-bars S', bolted or otherwise secured to the pivot-bars and having integral inwardly-extending foot-pieces s, against which the operator rests his feet, and by pushing on one or the other the pivot-bolts will be turned simultaneously, owing to the connection between the bars S' and the centrally-pivoted bars S. This construction permits of the rapid turning of the machine and enables it to be easily guided in following between furrows. The lower portion of the block R' has an arm R^2, provided with a segmental slot r^{21}, through which passes a pin r^4, riveted or otherwise secured to the bars F, the end walls of the slot forming stops which limit the movement of the bars S. In this arm R^2 is a slot or opening r^5, through which and through similar openings in the bars S may be passed a pin to lock the bars S in a central or normal position when the machine is to travel for any distance in a straight line.

To the upper portion of the bar D are connected the opposite ends of a U-shaped bar T, the rear portion of which extends for some distance back of the frame B and rests upon the upper portion thereof. The bar T carries a driver's seat t, clamped in position by a bolt t', passing through a transverse bar t^2, which extends under the two sides of the bar T and firmly holds the seat in position. By loosening the securing-nut of the bolt t' the seat and the clamping-bar t^2 may be moved backward and forward on the bar T and clamped in any desired position.

Referring to Figs. 15, 16, and 17, U represents a cultivator-tooth or other tool, centrally secured by a bolt u to a slotted arm u', pivoted at u^2 to a standard V. The upper portion of the bar u' is provided with openings u^3, through any one of which and through a similar opening in the standard may pass a securing-pin u^4, so as to permit of the ad-

justment of the angle of the teeth U. The upper portion of the standard V is in the form of an elongated tube and is adapted to pass through openings w in a clamp W, and the length of the standard is sufficient to permit of the vertical adjustment to a considerable extent, so that the distance of the teeth from the supporting-frame may be varied as required. The clamp W has lateral openings w' of a width sufficient to receive the bars g g' of the supporting-frame and is also provided with a set-screw w^2, which may be turned to force the bars of the supporting-frame into intimate contact with the standard and the latter into contact with the clamp, firmly locking the tooth into position. This construction permits not only of the vertical adjustment of the teeth, but also of their circumferential adjustment, and permits the locking of the teeth at any point on the supporting-frame, so that they may be set for furrowing at any required distances.

In Fig. 2 it will be noted that the bars g, at a point close to their connections with the frames E, are provided with tooth-holding clamps, the securing-screw w^2 being of sufficient length to permit the clamping of the tooth to a single bar in lieu of the double bars, which form the rear portion of the supporting-clamp.

Normally the implement carries eight narrow teeth, four on each of the supporting-frames; but for fallow earth a ninth tooth, carried by a frame y, may be employed. The frame y is of V shape and is inclined at an angle corresponding to the angle of the forward ends of the bars g and is locked in position by passing its ends through the openings w' of the clamp, after which the set-screw is turned to clamp the bars g, the frame y, and the teeth in position.

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

1. In combination, a tooth-carrying frame having a forward section, E, to which it is secured in alinement therewith to prevent lateral play, said section, E, being pivotally secured to the tooth-carrying frame and having a slot, e^5, elongated in the arc of a circle drawn from the said pivotal point, a pivot-bar, d, to which the portion, E, is pivoted, a clamp, F, surrounding the pivot-bar at a point between the side bars of the portion, E, and means for securing said clamp in position.

2. In a cultivator, a tooth-holding frame comprising flat bars in close contact along the tooth-securing points having their forward ends for attachment to the frame of the machine disposed at an angle to the main length of the bars and diverging at different points in their respective lengths, said bars being adjustable upon each other as and for the purposes, substantially as described.

3. In a cultivator, a tooth-holding frame comprising two flat bars secured together by the tooth-holding clamps attached thereto and adjustable lengthwise upon each other when released, the forward ends of the respective bars being bent at an angle to their length at different points in their respective lengths; said ends adapted to be secured to the frame of the machine and adjusted and spaced to regulate the angle of the combined tooth-carrying bar to the line of the machine, substantially as described.

4. A tooth-holding frame formed in two sections and comprising a main section to which the teeth may be secured, and a forward section to which the main section is adjustably secured, a bolt-and-slot connection between the two sections for adjusting the relative angular positions of the two, a pivot-bar carrying the forward section and means for effecting the lateral adjustment of said bar on said pivot-frame.

5. In combination, a tooth-carrying frame having its forward end depressed below the level of the main portion, a draft-bar hung to the frame of the machine and having its lower end operatively connected to the said depressed forward end of the tooth-carrying frame, substantially as specified.

6. In combination, a segmental rack, a pivoted locking-lever, locking bolts or dogs guided on the lever and movable independent of each other, said bolts being so arranged that they may separately engage in the spaces between the teeth of the rack and a single bolt-operating lever adapted to operate upon the said pair of locking-bolts.

7. In combination, a tooth-carrying frame, a frame, E, secured thereto, said frame, E, having opposite side bars, e, connected to each other by transversely-extending bars, e', e^2, e^3, a pivot-bar, d, to which the forward ends of the bars, e, are pivoted, a finger, f^2, projecting from the transverse bars, e', and partly embracing the pivot-bar, d and a clamp, F, surrounding the pivot-bar at a point between the finger, f^2, and one of the side bars, e.

8. A tooth-carrying frame comprising two flat bars, g, g', having their rear ends in close contact and forward ends separated, a section, E, situated between said bars, securing-bolts, g^2, g^3, connecting the bars to the section, E, and a pivot-bolt, d carrying the forward end of said section, E.

9. In combination, a tooth-carrying frame comprising a main section to which the teeth are attached, and a forward section, E, having opposite side bars, e, provided with segmental slots, e^5, securing-bolts, g^2, g^3, connecting the two sections of the frame, a pivot-bolt, d to which the section, E, is pivoted.

10. In an agricultural machine, the combination of the tool-carrying frame, a lever connected to said frame, an arm connecting the free end of the lever pivotally mounted on the frame of the machine, a tension-spring adapted to act on said arm, and means for adjusting the point of contact between the arm and the spring, for the purpose specified.

11. In an agricultural machine, a tool-car-

rying frame, a lever pivoted to a fixed point and operatively connected to said tool-carrying frame, a tension-spring adapted to act upon said lever, the point of connection between the lever and spring being adjustable to either side of the pivot-point of the said lever.

12. In an agricultural machine, a tool-carrying frame, a lever operatively connected thereto and having one of its arms pivoted to a fixed point and arranged in a substantially-vertical plane, a tension-spring having a sliding contact with said arm, and means for adjusting said sliding contact.

13. In an agricultural machine, a tool-carrying frame, a lever operatively connected thereto and having one arm pivoted to a fixed point and arranged in a substantially-vertical plane, an antifriction roller or block vertically adjustable on said arm, and a tension-spring having one of its ends connected to said roller or block.

14. In an agricultural machine, a tool-carrying frame, a lever operatively connected thereto and having one arm pivoted to a fixed point and arranged in a substantially-vertical plane, an antifriction-roller adjustable along the length of said arm to points on either side of its pivot, and a tension-spring having one of its ends operatively connected to said roller.

15. In an agricultural machine, a tool-carrying frame, a lever operatively connected thereto and having one of its arms pivoted to a fixed point and arranged in a substantially-vertical plane, an antifriction-roller in contact with one face of said arm, a carrying-plate for said roller, means for vertically adjusting the roller and its carrying-plate, and a tension-spring having one of its ends connected to said plate.

16. In an agricultural machine, a tool-carrying frame, a lever for effecting the vertical adjustment of said frame, a tension-spring adapted to act upon said lever, means for regulating the tension of the spring, and means for adjusting the point of contact between the lever and the spring.

17. In an agricultural machine, a tool-carrying frame, a pivoted lever operatively connected to said frame, a tension-spring having one of its ends operatively connected to said lever and adjustable along the length of the lever, a threaded bolt connected to the opposite end of said spring, and an adjusting-nut on said bolt for regulating the tension of the spring.

18. In an agricultural machine, a tool-carrying frame, a lever, I', having one arm, i', arranged in a substantially-vertical plane and centrally pivoted to a fixed point, means for connecting said lever to said frame, an antifriction-roller adapted to the rear face of said arm, i', and adjustable along the length of said arm, and a tension-spring operatively connected to said antifriction-roller.

19. In an agricultural machine, a tool-carrying frame, a lever, I', having two arms, i', i^2, the arm, i', being arranged in a substantially-vertical plane and centrally pivoted to a fixed point, links, j, connecting the arm, i^2, to the tool-carrying frame, an antifriction-roller, l', adjustable along the length of the arm, i', and a tension-spring operatively connected to said antifriction-roller.

20. In an agricultural machine, a tool-carrying frame, a lever for effecting the vertical adjustment of said frame, a plate, L, an antifriction-roller, l', carried thereby, an adjusting-lever, N, links connecting said adjusting-lever to the plate, L, and a tension-spring having one of its ends connected to said plate, L.

21. In an agricultural machine, a tool-frame, a lever, I', having two arms, i', i^2, links, j connecting the arm, i^2, to the tool-carrying frame, a pivot, i, for the arm, i', a plate, L, an antifriction-roller, l', carried by said plate and in contact with the rear face of the arm, i', a lever, N, having an arm, n, links, n', connecting the arm, n, to the plate, L, means for locking said lever, N, in any position to which it may be adjusted, and a tension-spring having one of its ends connected to said plate, L.

22. The combination of the arched frame comprising a pair of flat bars, o, blocks, O' secured between said bars to form bearings for the upper ends of the pivot-bars, blocks, O, secured between the lower ends of the arched bars, o, having openings through which the pivots, P, pass, pivot-bars, P, and the two-part boxing, q, surrounding the pivot-bars and rigidly secured thereto, substantially as described.

23. The combination of the arched bars, o, supported on pivot-wheels, draft-bars, C, and blocks, R, adapted to be secured to the bars, C, having recesses, r, adapted to embrace and securely hold the flat bars, o, substantially as described.

24. The combination with the arched frame, of integral axle and pivot bars swiveled in said frame, foot-levers secured to said pivot-bars having inwardly-extending arms, S', a pair of connecting-bars, S, pivoted at each end to the arms, S', and a block, R', secured centrally between the frame-bars, o, to which the connecting-bars are pivoted, substantially as described.

25. The combination of the wheel-pivots having bars, S', provided with steering foot-pieces, s, the frame, a block, R', secured to the frame and having a laterally-projecting slotted arm, R^2, bars, S, connecting the arms, S', and centrally pivoted to said block, R', and a stop-pin carried by the bars, S, and extending through the slot of the arm, R^2.

26. The combination of the wheel-pivot having arms, S', provided with foot-pieces, s, the frame, a block, R', secured to said frame, a laterally-projecting arm, R^2, extending from the block, R', and having an opening or slot, r^4, bars, S, connected at their opposite ends to the arms, S', and centrally pivoted to the

block, R′, and a removable locking-pin, s^2, adapted to press through the slot, r^4, and through openings formed in the bars, S.

27. In combination, a frame, M, having a segmental surface provided with equidistant notches or spaces, m, a lever, N, pivoted to said frame, locking-bolts, m', m^2, guided on said lever and adapted to engage independently in the notches or spaces, m, springs, m^4, for forcing said locking-bolts into locking position and an operating rod or wire, m^5, engaging with said locking-bolts, substantially as specified.

28. In combination, a clamp, W, having lateral openings, w', and a vertical opening, w, a toothed standard, V, adapted to pass through the opening, w, and adjustable both vertically and circumferentially in said opening, w, a holding-frame adapted to the lateral openings, w', and a set-screw, w^2, carried by the clamp and adapted to force the frame, tooth, and clamp into intimate contact with each other, substantially as specified.

29. An agricultural-implement frame comprising the frames, G, oppositely arranged, an auxiliary carrying-frame, y, and clamps for connecting the teeth to the frame and securing the auxiliary frame to the main frame, substantially as described.

In witness whereof I have hereunto set my hand this 28th day of May, A. D. 1897.

SAMUEL L. ALLEN.

Witnesses:
EDMUND S. MILLS,
HORACE PETTIT.