

3 Sheets—Sheet 1.

No. 531,605.

Patented Dec. 25, 1894.



F. b. Noyes.
C. B. Crocker.

INVENTORS
Charles H. Warner
George A. Crane
by B. J. Boyes, atty.

3 Sheets—Sheet 2.

No. 531,605.

Patented Dec. 25, 1894.

Fig. 3.

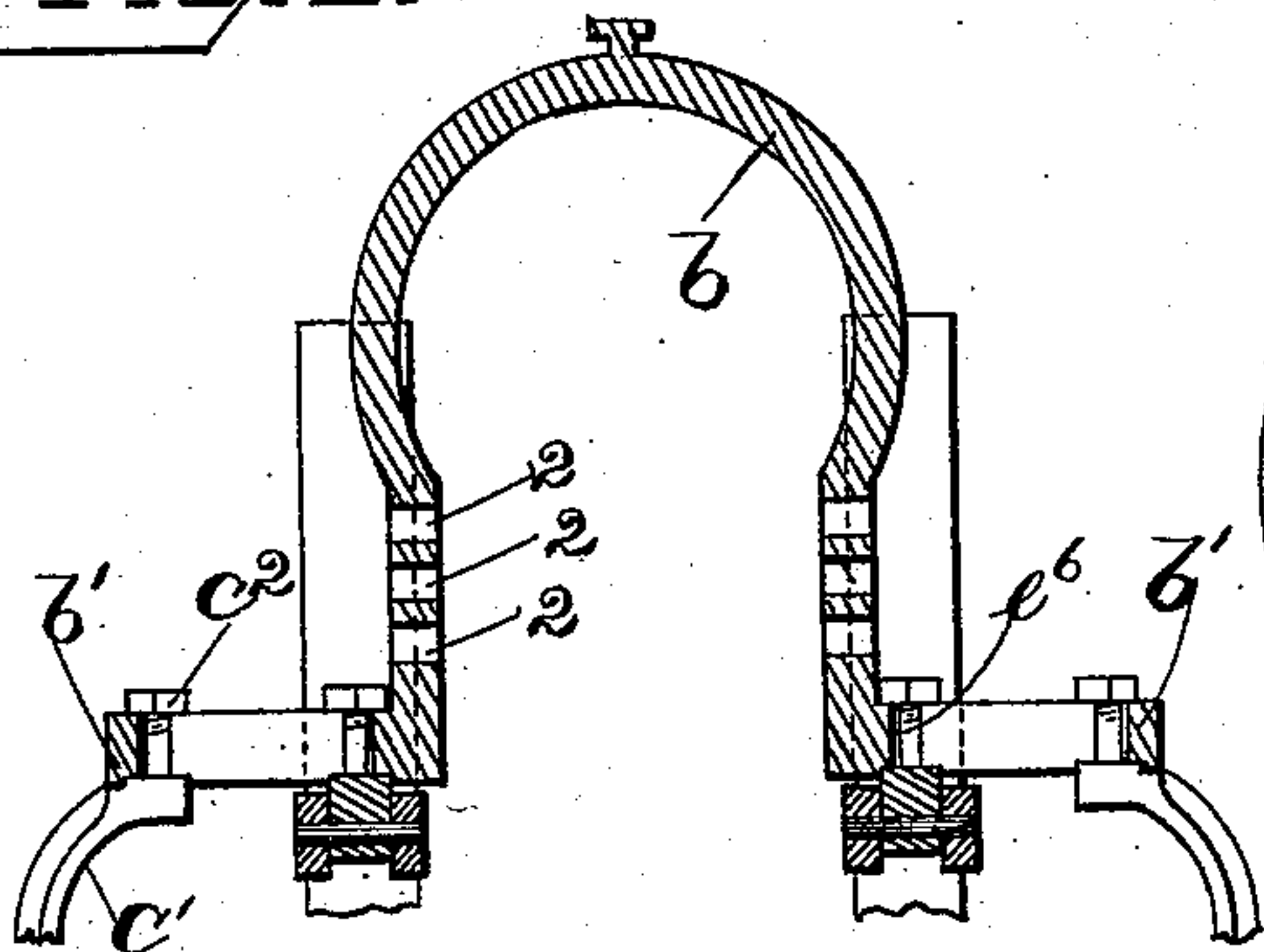


Fig. 5.

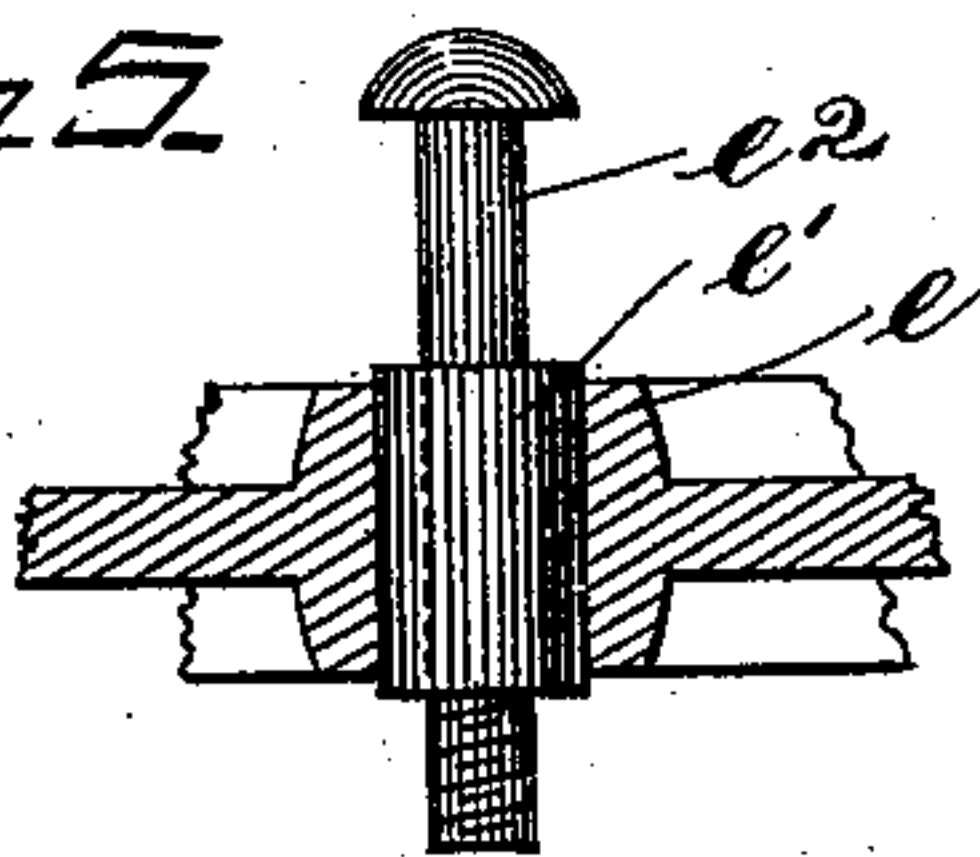


Fig. 6.

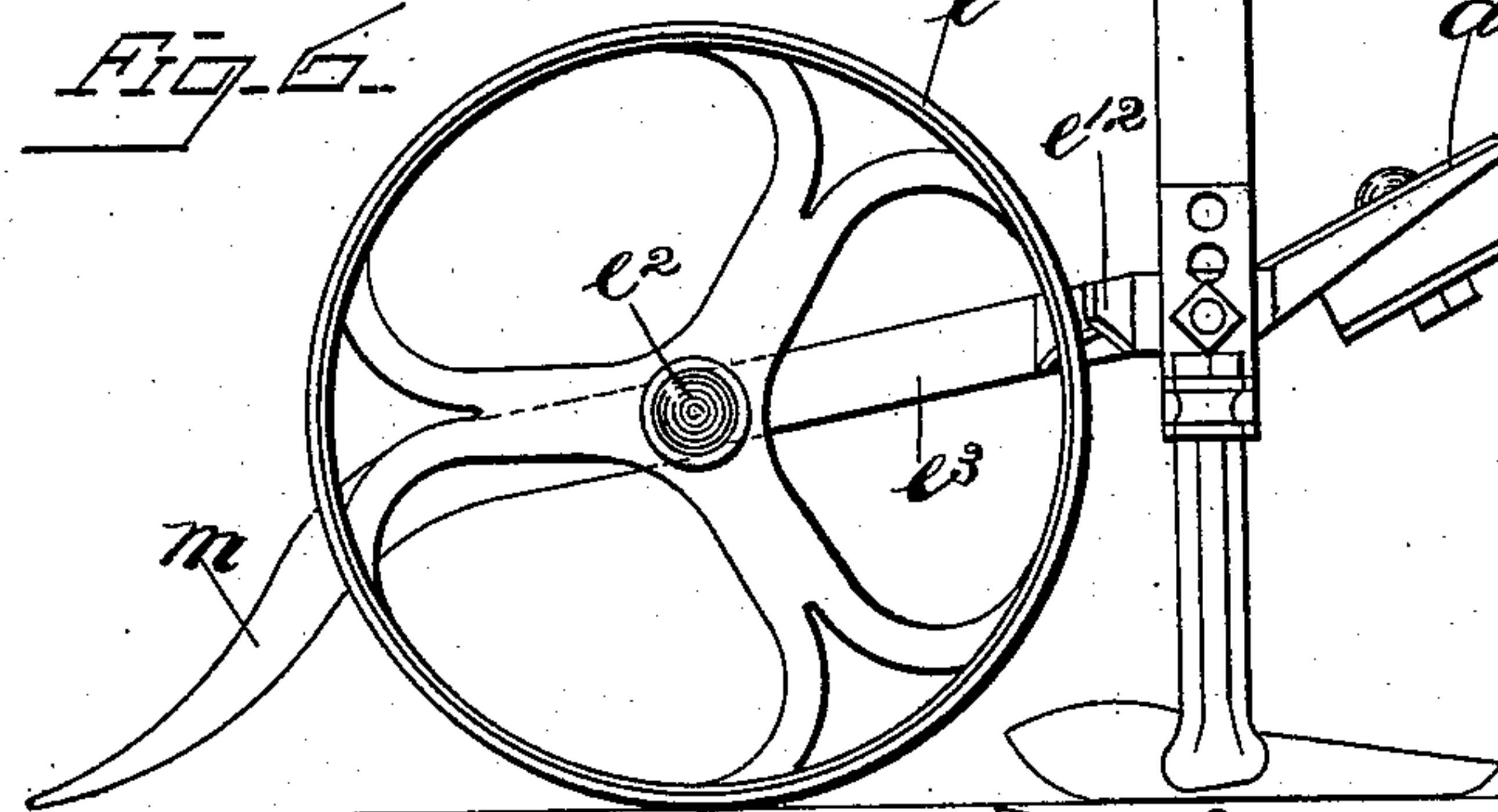
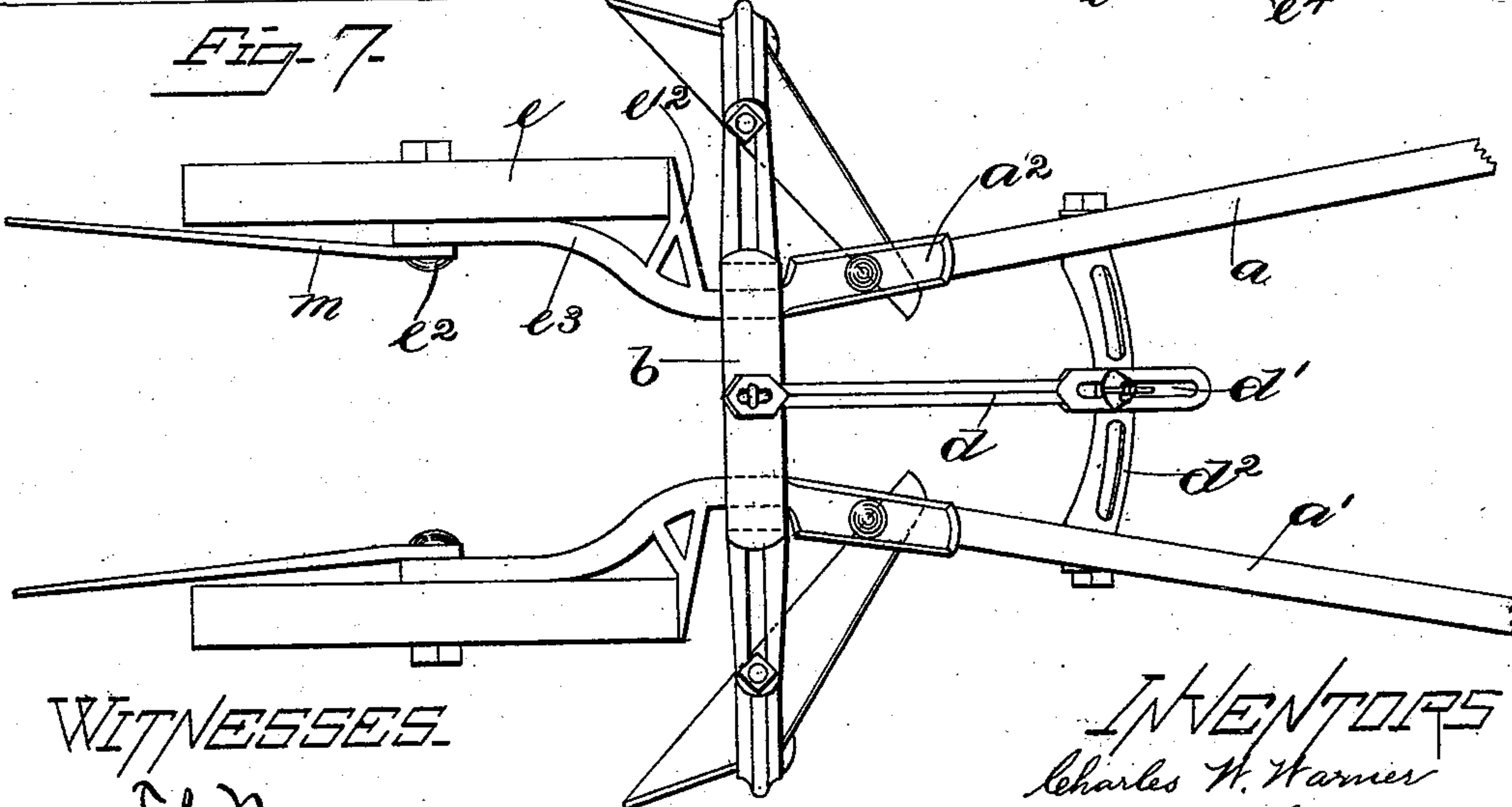


Fig. 7.



WITNESSES.

F. B. Noyes.
C. B. Crocker.

Fig. 8.

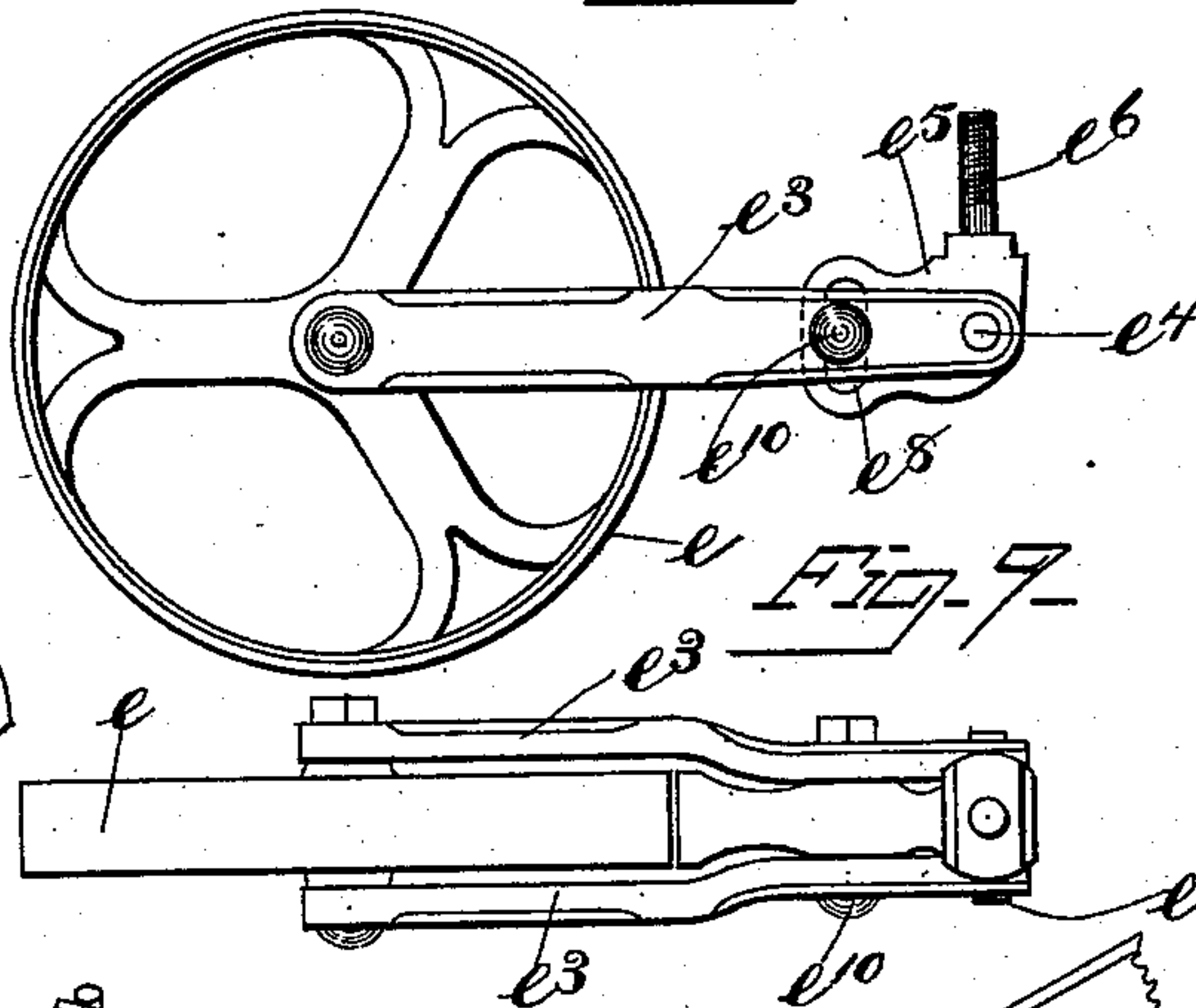
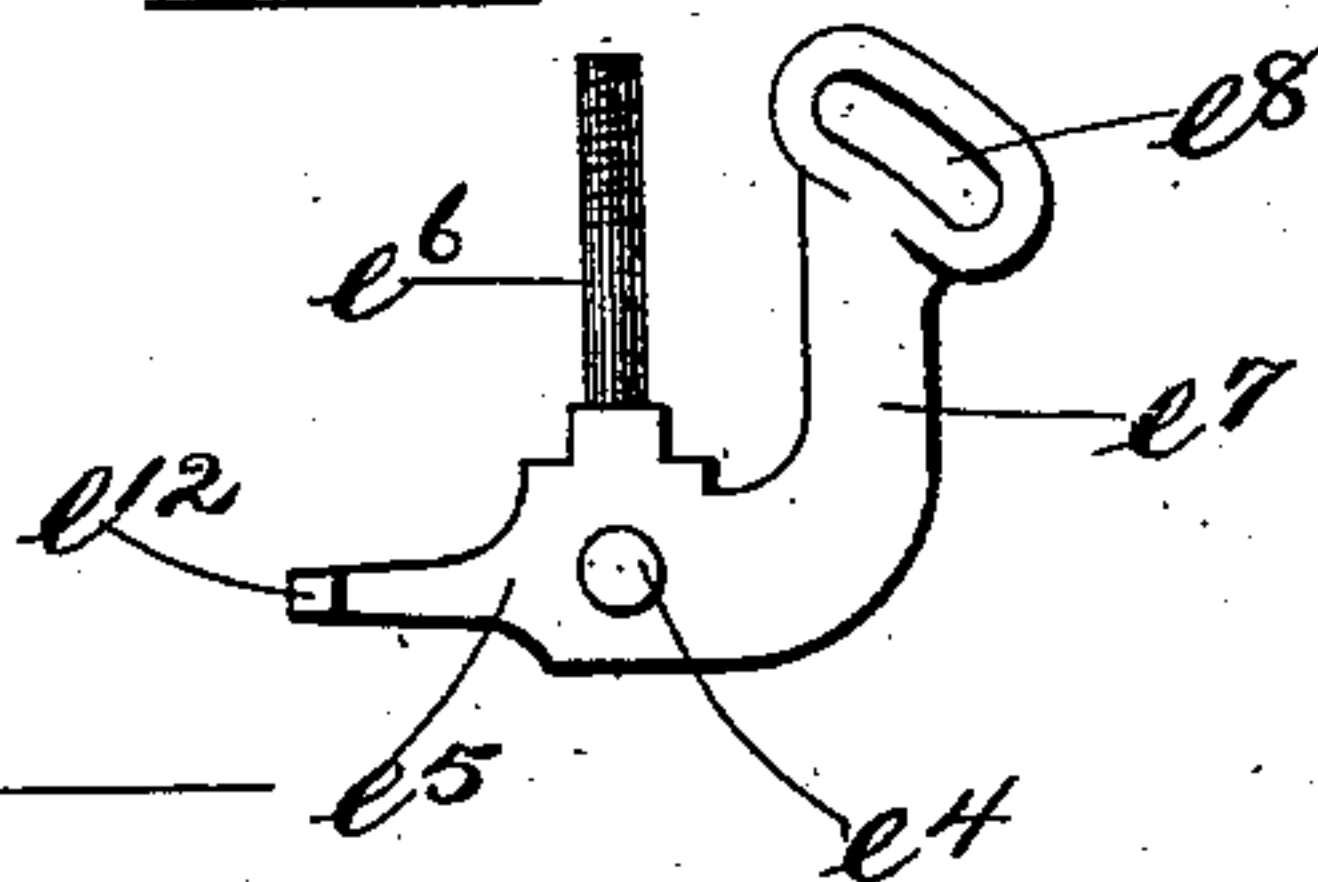


Fig 9

Fig. 4



INVENTORS

Charles H. Harner
George A. Crane
by B. J. Hayes atty

(No Model.)

3 Sheets—Sheet 3.

C. W. WARNER & G. A. CRANE.
CULTIVATOR.

No. 531,605.

Patented Dec. 25, 1894.

Fig. 10.

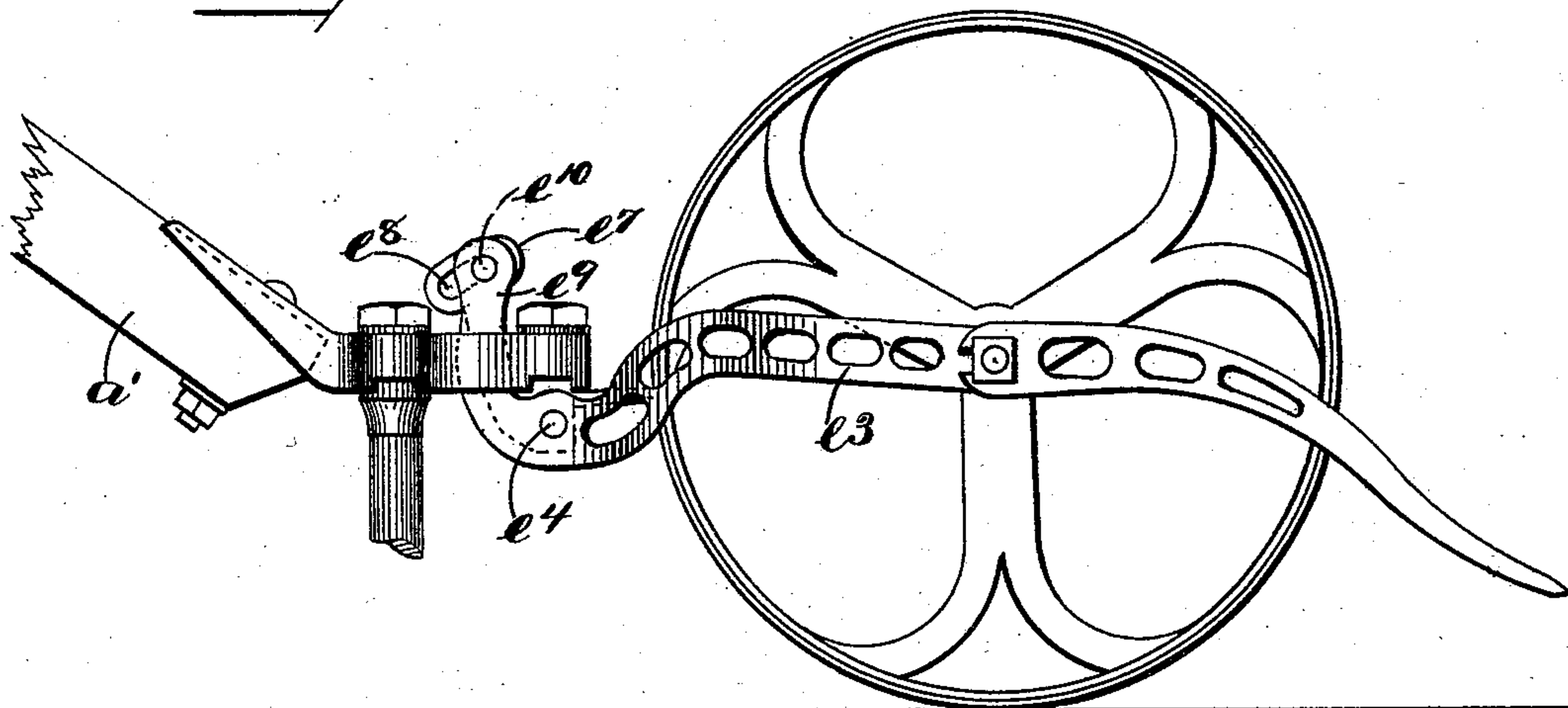
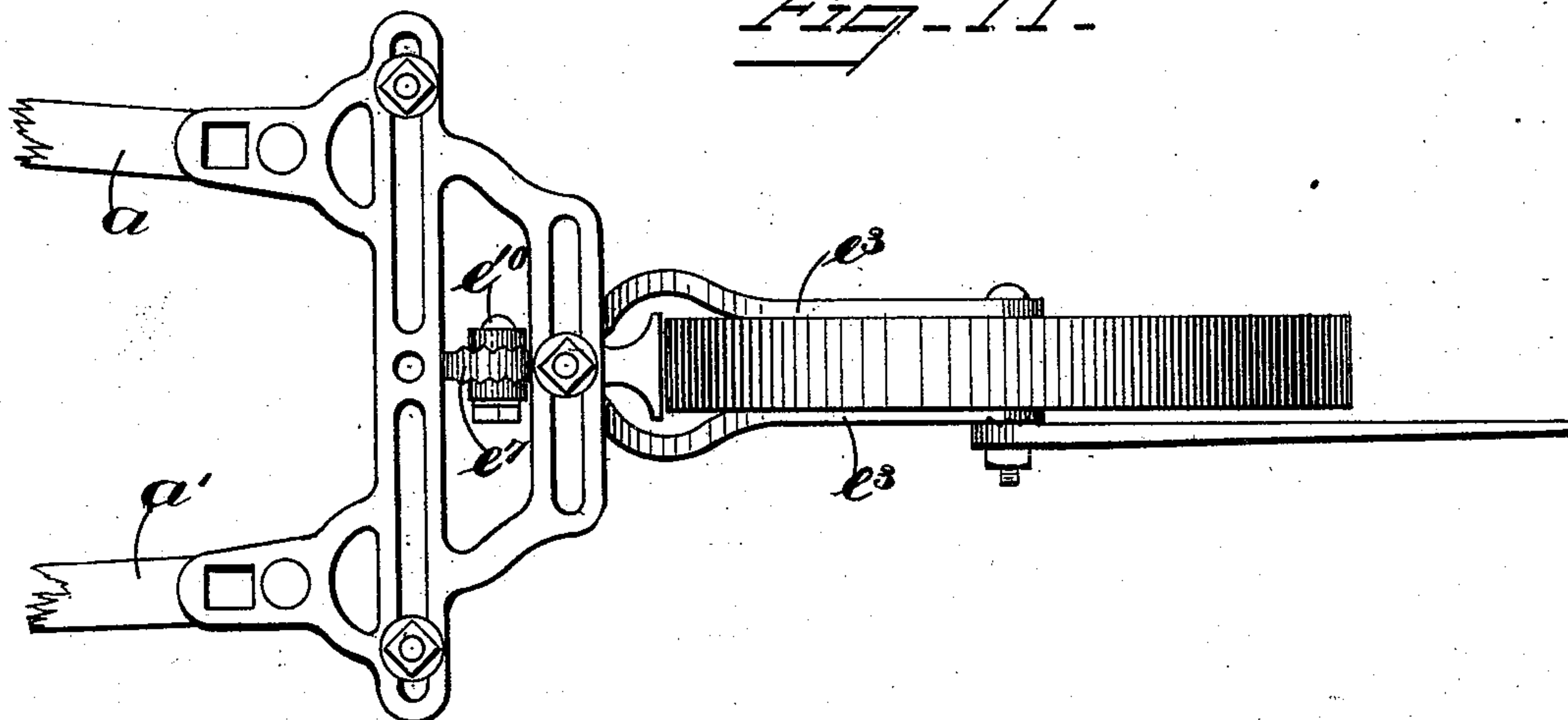


Fig. 11.



WITNESSES.
Charles D. Crocker.
Frederick S. Pennington

INVENTORS
Charles W. Warner
George A. Crane
By B. J. Hayes atty.

UNITED STATES PATENT OFFICE

CHARLES W. WARNER, OF MELROSE, AND GEORGE A. CRANE, OF WORCESTER,
MASSACHUSETTS.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 531,605, dated December 25, 1894.

Application filed November 13, 1893. Serial No. 490,839. (No model.)

To all whom it may concern:

Be it known that we, CHARLES W. WARNER, of Melrose, county of Middlesex, and GEORGE A. CRANE, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Cultivators, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object to improve the construction of wheel-hoes, or cultivators, whereby the hoes or cultivator teeth or other tools which may be employed, may be adjusted vertically, and also pitched at different angles; and also whereby the wheel or wheels may be adjusted with said tools or independently, together with the vine guard or guards which may be connected therewith.

Figure 1, shows in plan view a wheel-hoe or cultivator embodying this invention, the handles and vine guards being broken off to save space on the drawings; Fig. 2, a side elevation of the wheel-hoe shown in Fig. 1; Fig. 3, a cross section of the wheel-hoe shown in Fig. 1, taken on the dotted line $x-x$, on a smaller scale, the tools being broken off at their shanks; Fig. 4, a detail showing a portion of the adjustable frame carrying the wheel; Fig. 5, a detail showing the bearing for the wheel. Fig. 6, is a side view of a modified form of wheel hoe. Fig. 7, is a plan view of the wheel hoe shown in Fig. 6; Figs. 8 and 9, side and plan views respectively of a modified form of adjustable frame for the wheel; Figs. 10 and 11, side and plan views of a modified form of wheel-hoe or cultivator, showing a single wheel.

The handle bars a, a' , are provided at their lower ends with like metallic end pieces a^2 , each having a transverse bolt hole through it, near its extremity, said parts constituting the essential elements of the main or handle frame. An arched frame b , made as an independent piece is secured to said end pieces a^2 , by the bolts which pass through the bolt holes therein, said arched frame being provided at each side with a slotted extension b' , which project horizontally in opposite ways. To provide for vertical adjustment of said independent arched frame b , it is herein repre-

sented as having at each side several bolt holes 2, arranged one above the other, three being herein shown, either pair of which may receive the attaching bolts.

The hoes c , or cultivator teeth or other garden tools, are bolted or detachably connected in any desirable way to the slotted extensions b' , as for instance the shanks c' of said tools or tool holders, may project up through the slots, and their upper ends supplied with nuts c^2 . They may thus be moved so as to occupy different positions relative to their supporting frame.

A link d is loosely connected at its forward end to the top of the arched frame b , and its opposite end is slotted as at d' , and a cross piece d^2 , is connected to and between the handles a, a' , which is provided with a thumb screw or bolt d^3 , which passes through the slot d' in the link d . By loosening said thumb bolt d^3 , the link d may be moved longitudinally, to thereby move the arched frame b on its attaching bolts as pivots.

The angles or pitch of the hoes c , cultivator teeth or other garden tools which are connected with the arched frame, are thereby changed.

The link d and thumb screw constitute a retaining device for retaining the pivoted arched frame at any angle, or in any different position that it may be set, and we desire it to be understood that so far as our invention is concerned any other specific form or construction of retaining device may be employed in lieu of that herein shown, and come within the spirit and scope of this invention. Said link however may be omitted if desired, and the arched frame b held in its vertical position by the attaching bolt or otherwise, but in such instance vertical adjustment only will be afforded for said arched frame, providing such adjustment is desired. The ground wheel e (although two are herein shown one only may be employed), is placed upon a sleeve or bushing e' mounted on a bolt e^2 , which passes through holes in the arms e^3, e^3 , formed near their extremities, said arms thereby astriding the wheel e . The arms e^3, e^3 , are pivotally connected at e^4 , to a block e^5 which is interposed between them, and secured in fixed position.

The interposed block e^5 , is bolted or otherwise detachably connected to the lateral extension b' of the tool-carrying frame, it being herein represented as having a shank portion e^6 , see Fig. 4, which passes up through the slot in said lateral extension b' , and supplied with a nut for securing it in place.

The interposed block or piece e^5 , has a rearward and upwardly turned extension e^7 , provided with a diagonal slot e^8 , near its extremity, and the arms e^3 , e^3 , have each like rearward and upwardly turned extensions e^9 , and the bolt e^{10} , passes through said extensions e^9 , and through the slot e^8 , and when the nut is tightened the said extensions are firmly secured together with the interposed block between them.

By securing the extensions together, with the bolt e^{10} at different points of the slot e^7 , it will be seen that different elevations will be given to the forward ends of the arms e^3 , e^3 . Thus it will be seen that the ground wheel e is detachably connected with the slotted tool-carrying frame; that it may be raised or lowered with relation thereto by the adjusting device just described; that it may be adjusted vertically bodily in conjunction with said frame; that it may be tilted bodily with said frame; and that it may be moved laterally in the slot in the extension b' .

It is obvious that one of the arms e^3 , may be omitted, if desired, two being employed for strength and durability.

The interposed block e^5 , has a scraper or cleaner e^{12} , formed upon it which terminates adjacent the wheel e .

Instead of the particular form or construction of adjusting device for the wheel supporting arms e^3 , e^3 , above described, the form shown in Figs. 8 and 9, may be employed. Referring to said figures, the arms e^3 , e^3 , are pivotally connected at their rear extremities as at e^4 , to the interposed block e^5 , and the slot e^8 , in said block e^5 , is formed between the pivot e^4 , and the wheel e , and the bolt e^{10} , joins the arms e^3 , e^3 , together passing through said slot in a manner similar to that heretofore described. In this latter form the scraper or cleaner will be provided on the interposed block e^5 substantially as above described.

The result accomplished by the two constructions is substantially the same.

In case independent adjustment of the wheel e is not desired, it may be supported as shown in Figs. 6 and 7, wherein it will be seen that the arm e^3 , is formed as a part of the main or handle frame, being formed integral with the end pieces a^2 , and in such case the scraper or cleaner e^{12} , may be formed integral therewith also.

The vine guard m has a hole through it at its rear end to receive the shank of the bolt e^2 , upon which it turns as a pivot, and the face of said guard adjacent the supporting arm, as well as the face of said supporting arm are each provided with projections or serrations adapted to interlock, so that as the

forward ends of the vine guard are raised or lowered in the arc of a circle about the bolt e^2 as a center, and the nut on said bolt is tightened, it will be held securely in any position in which it may be set. Thus adjustment is obtained for the vine guard.

We are aware that an adjustable vine guard is not broadly new, but so far as we are aware we are the first to adjust the same on a pivot or center.

In single wheel hoes the arched frame may be omitted, although the wheel e may be supported by the adjustable supporting arms as herein shown.

Referring to Figs. 10 and 11, a single wheel-hoe is shown, the wheel being supported by a frame as in Figs. 1, 2, 4, 8, and 9, said frame being supported by a slotted tool-carrying frame to which the handles a , a' are attached.

We claim—

1. In a device of the character described, the combination of the handle frame, wheels and tools, and an arched frame supporting said tools and arranged transversely to the line of draft, and pivot bolts connecting it with the handle frame, substantially as described.

2. In a device of the character described, the combination of the handle frame, wheels and tools, and an arched frame supporting said tools, arranged transversely to the line of draft, pivot bolts therefor, and a retaining device for retaining said pivoted arched frame at any angle at which it may be set.

3. In a device of the character described, the combination of the handle frame, wheels and tools, and an arched frame supporting said tools, pivot bolts therefor, and the adjustable link d connected at one end to the arched frame and at the other end to a fixed point.

4. In a device of the character described, the combination of the handle frame, wheels supported thereby and tools, and a vertically adjustable arched frame supporting said tools arranged transversely to the line of draft and connected with said handle frame, substantially as described.

5. In a device of the character described, the combination of the handle frame, wheels supported thereby and tools, and an arched tool supporting frame having at each side several holes arranged one above the other, any pair of which may receive the attaching bolts for attaching it to the handle frame, substantially as described.

6. In a device of the character described, the combination of the handle frame, wheels supported thereby and tools, and an independent arched frame having slotted extensions b' , projecting in opposite ways which receive and support the tools, and bolts attaching said independent arched tool-carrying frame to the handle frame.

7. In a device of the character described, the combination of the handle frame, a wheel and supporting arm therefor, the bolt e^2 ex-

tending through said supporting arm, and bushing *e'* thereon upon which said wheel revolves, and the vine guard *m* also on said bolt *e*², adapted to be clamped between the supporting arm and bushing by tightening the nut on said bolt.

8. In a device of the character described, the combination of the handles, slotted tool-carrying frame connected thereto, a wheel, and supporting arm therefor, a block detachably connected with said tool-carrying frame to which said wheel-supporting arm is pivotally connected, and an adjusting device for said wheel-supporting arm.

9. In a device of the character described, the combination of a handle frame, tool-carrying frame, and tools carried by it, a wheel and a laterally adjustable supporting arm therefor.

10. In a device of the character described, the combination of the handles, arched tool-carrying frame connected thereto, having

slotted extensions *b'*, two wheels, and supporting arms therefor, adjustably and detachably connected with said extensions *b'*.

11. In a device of the character described, a wheel, and supporting arm therefor, a block to which it is connected having a scraper *b*², thereon which terminates adjacent the wheel,

12. In a device of the character described, a wheel and supporting arm therefor, a block having a scraper *e*¹², thereon which terminates adjacent the wheel, pivot bolt connecting said wheel supporting arm with a block, and an adjusting device for adjusting said arm with relation to the block.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES W. WARNER.

GEORGE A. CRANE.

Witnesses:

PEMBROKE S. RICH,

CHARLES F. ALDRICH.