

No. 657,695.

Patented Sept. 11, 1900.

H. R. FOWLER.  
HAND-CULTIVATOR.

(Application filed Aug. 17, 1899.)

(No Model.)

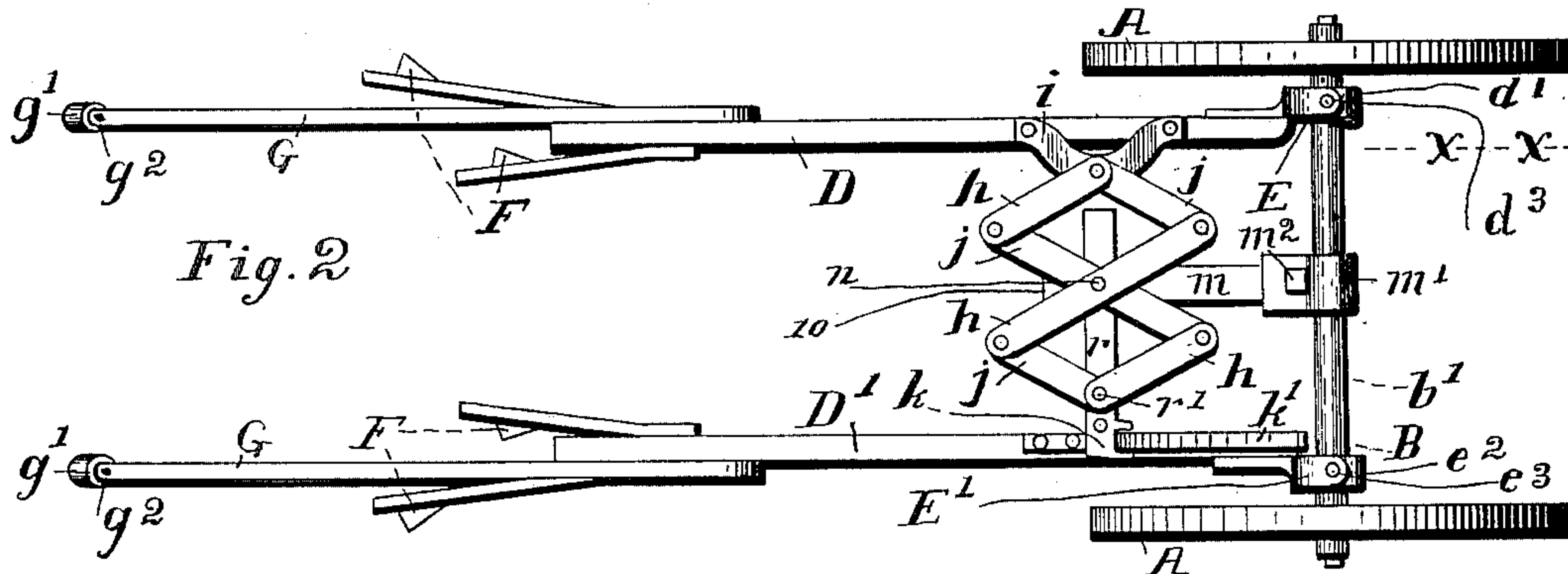
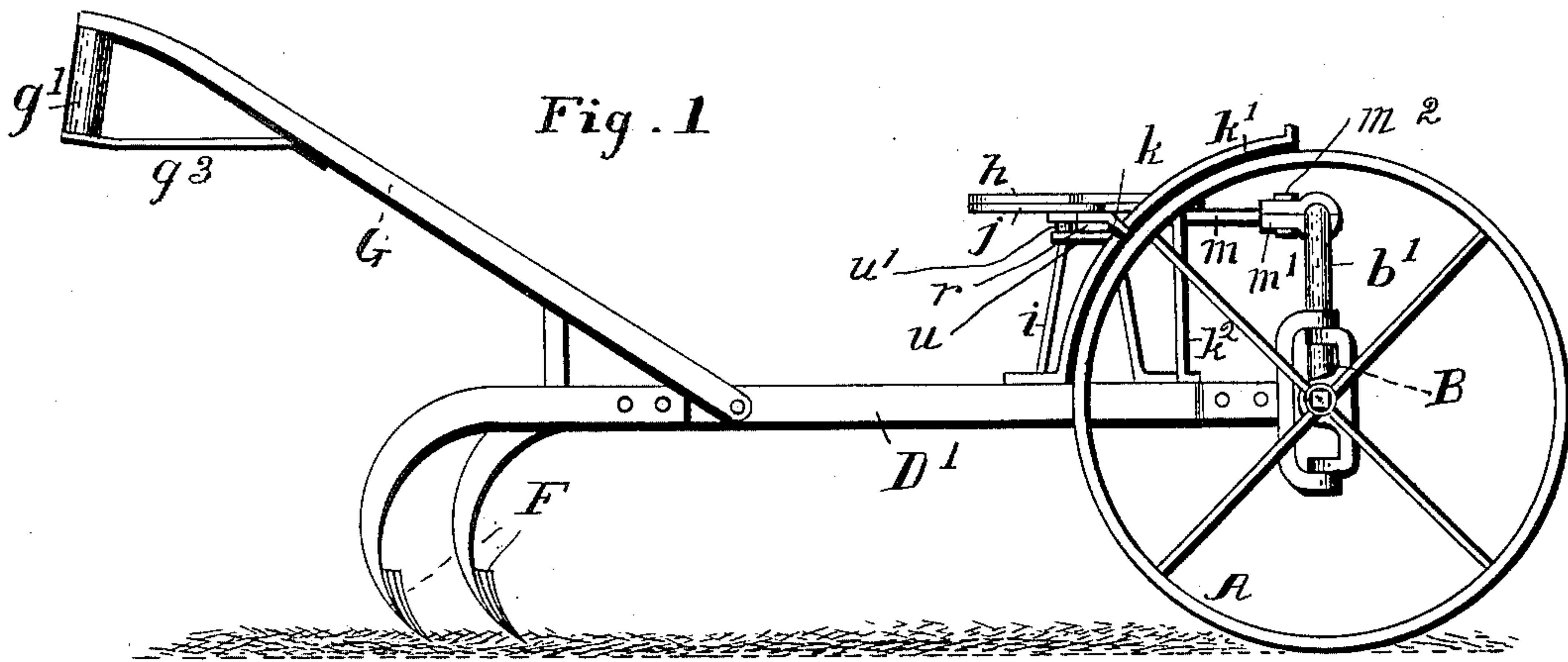


Fig. 3

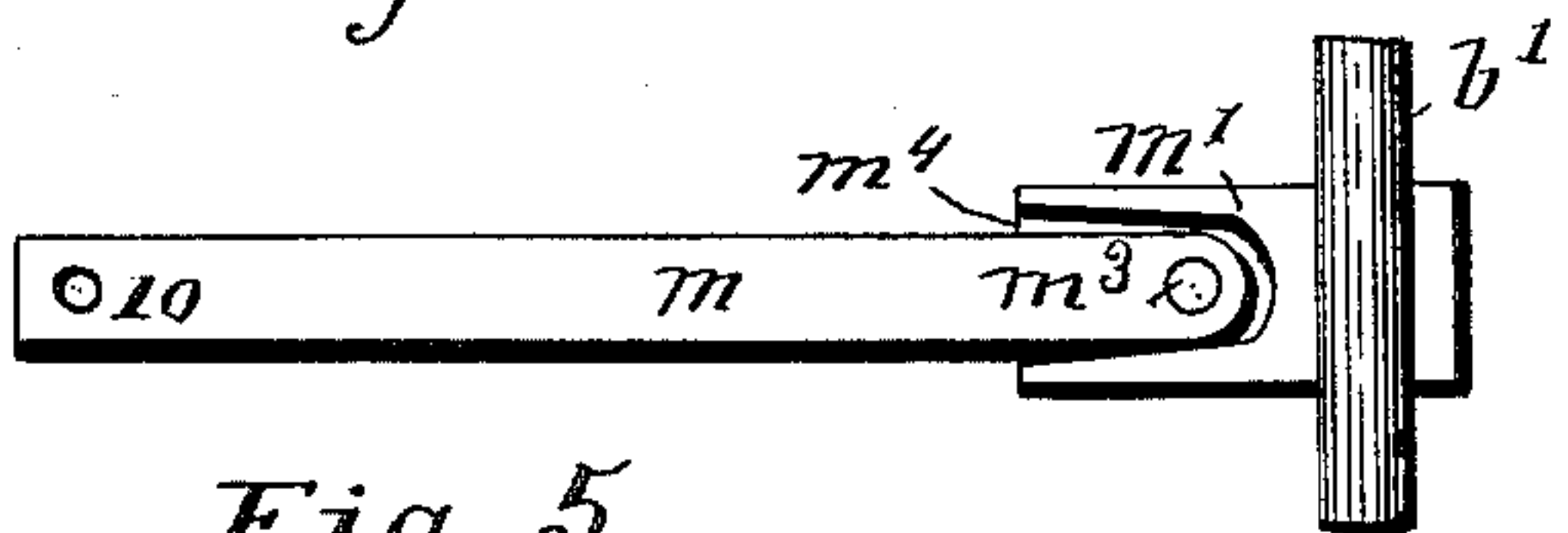


Fig. 4

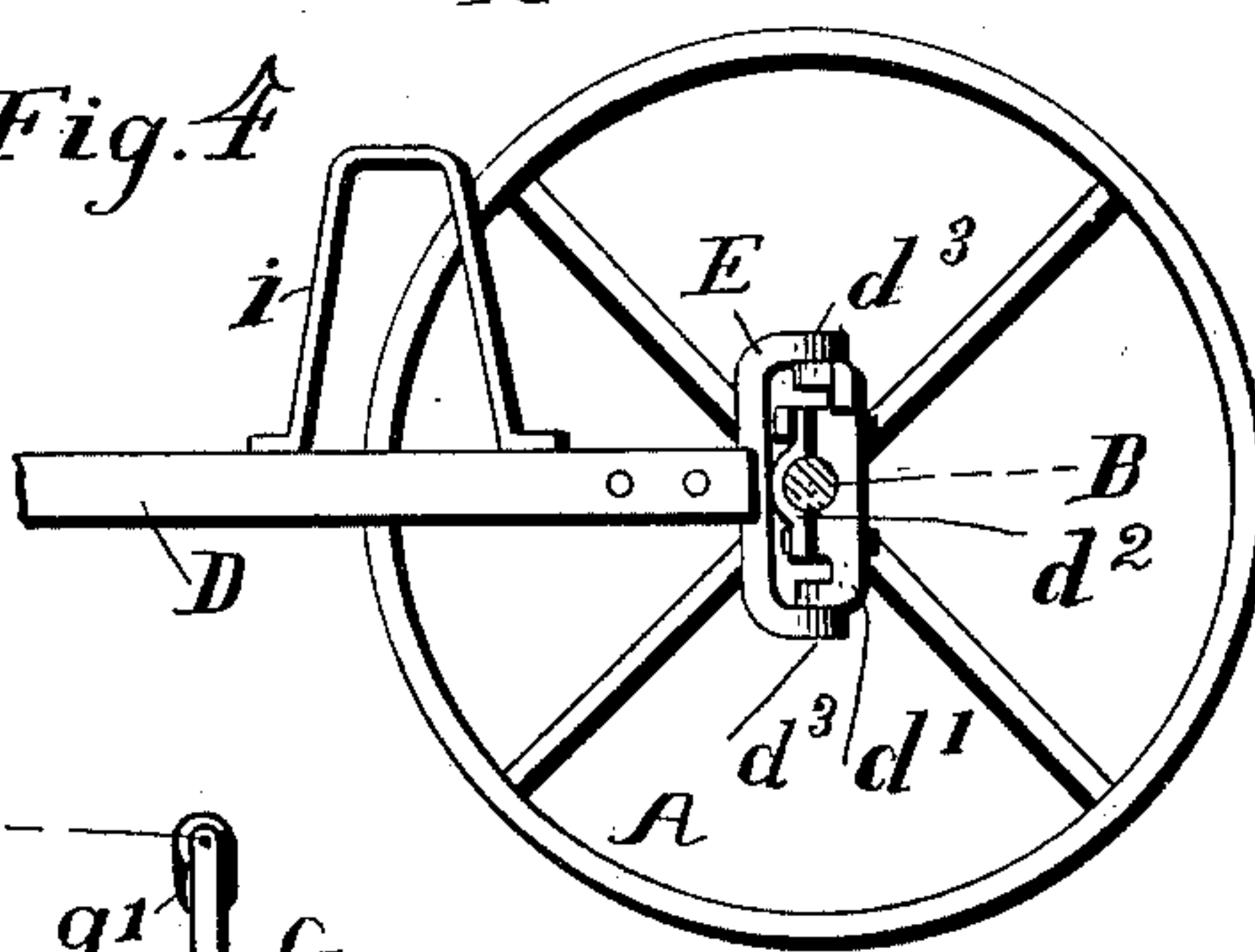


Fig. 5

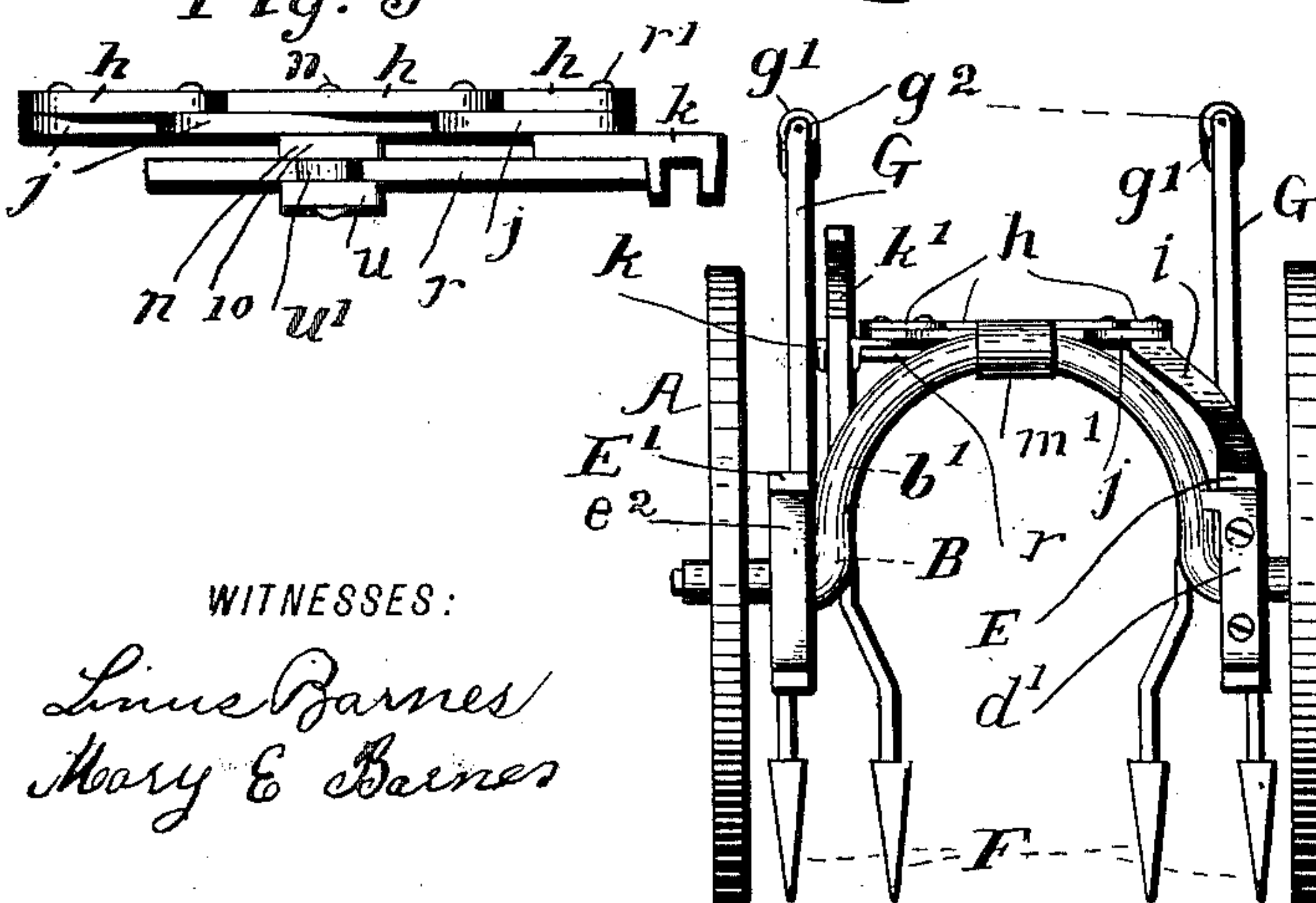
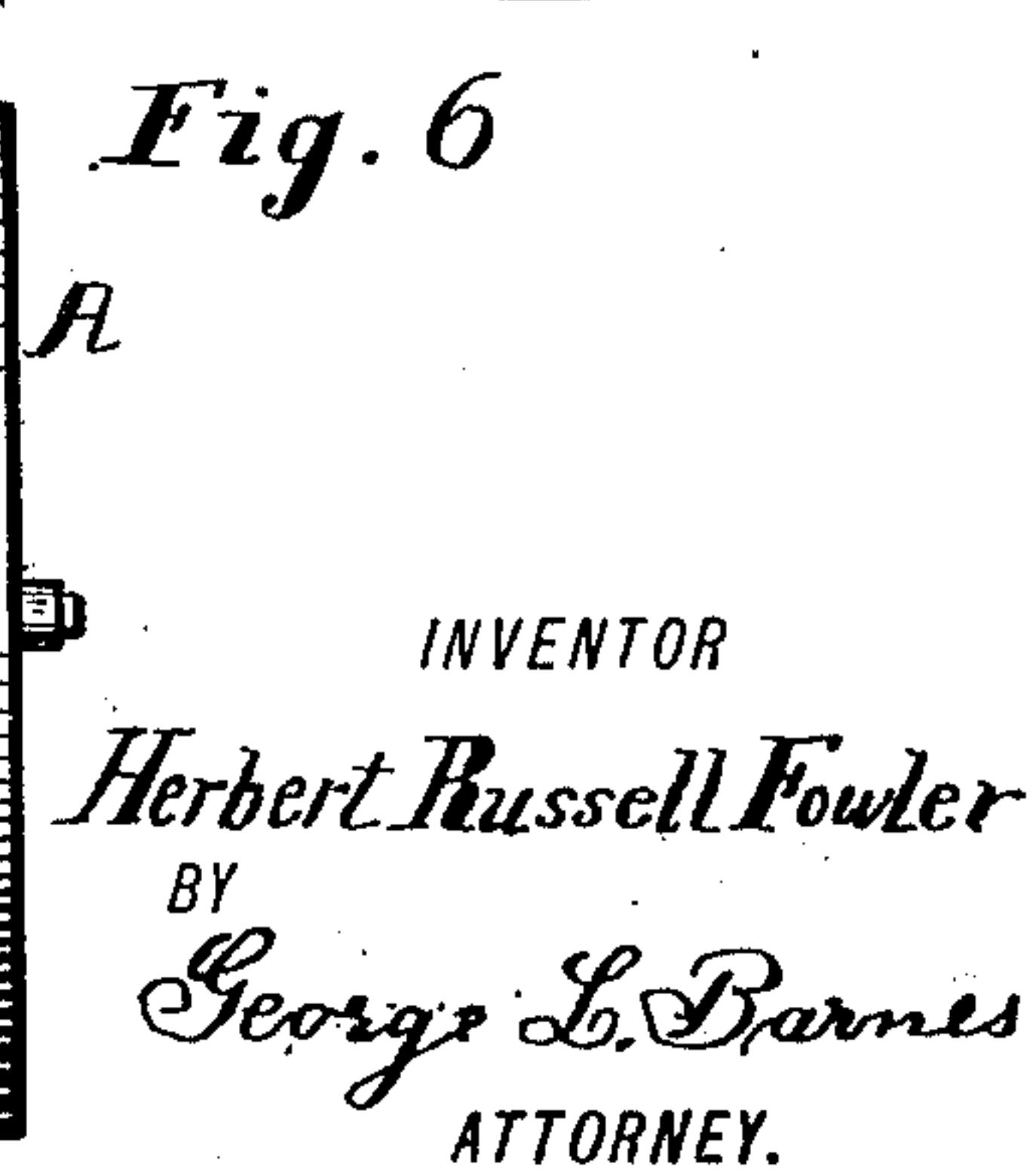


Fig. 6



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# UNITED STATES PATENT OFFICE.

HERBERT RUSSELL FOWLER, OF CLINTONVILLE, CONNECTICUT.

## HAND-CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 657,695, dated September 11, 1900.

Application filed August 17, 1899. Serial No. 727,541. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT RUSSELL FOWLER, a citizen of the United States, residing at Clintonville, in the township of North Haven, county of New Haven, and State of Connecticut, have invented certain new and useful Improvements in Hand-Cultivators, of which the following is a specification.

My invention relates to an improvement in cultivators, and has for its object to provide a cultivator that may be operated by hand and adapted to all the requirements and motions necessary in such an implement to accomplish its work thoroughly and with ease. It is particularly important in this class of machines that the two limbs of the implement shall be adapted to spread apart or close up equally and uniformly with reference to the axis of the wheels and shall be capable of vertical or lifting movement each independently of the other and of a certain amount of longitudinal play or movement relative to each other for purposes of guiding, all of which features are provided for in my improved device.

The invention consists in the novel mechanical movements and construction, arrangement, and combination of parts for attaining the results hereinbefore enumerated, as hereinafter more particularly described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of my improved cultivator, and Fig. 2 is a plan view of the same. Fig. 3 is a plan view of a detail feature of the device. Fig. 4 is a vertical elevation with the axle in section on the line  $x x$ , Fig. 2, showing the connection of frame and axle. Fig. 5 is a rear view of the mechanical movement connecting the two limbs of the machine and the axle. Fig. 6 is a front view of the machine.

Referring to the drawings, A denotes the wheels of the machine, which are mounted upon an axle B outside of and in juxtaposition to the frames D D' of the machine. Between the frames the axle is curved upward in the form of an arch or semicircular bend  $b'$ , of sufficient height to clear plants as it is passed along over the row in operation. The

frame D is connected to the axle by means of the casting  $d'$  and its cap  $d^2$ , bolted thereto and having the axle clamped between them, the casting being hinged by the pivots  $d^3$  to the fork E, secured to the frame, whereby the frame is adapted to be moved laterally, swung from the pivots  $d^3$  as a center and also vertically by turning the axle in its bearings in the wheels. The opposite frame D' is provided with a fork E', similar to the fork E, which is hinged to a casting  $e^2$  by means of the pivots  $e^3$ , and said casting  $e^2$  is provided with a bearing receiving the axle. The frame D' is therefore adapted to the same movements as the opposite frame, but with this difference: that in its vertical movement it oscillates upon the axle instead of carrying the axle with it. Said vertical movements of the frame are wholly independent of each other and may take place in opposite directions at once. The frames are provided at their rear ends with cultivating hoes or cutters F for digging up the soil and destroying weeds; but these form no part of this invention and require no further description.

Handles G are attached to the frames, by which the machine may be pushed along the plant-rows by the operator. Said handles terminate at their rear ends in the novel grips  $g'$ , each cylindrical in shape and having a rivet  $g^2$  passing through it and the handle, and a brace  $g^3$ , which is secured to the handle, as shown, forming a handle very similar to a shovel-handle, placed in a vertical plane and which is very advantageous in pushing the cultivator.

The two frames D D' are connected by means of two sections of the well-known mechanical movement known as the "lazy-tongs," comprising the two series of parallel levers  $h$  and  $j$ , arranged in lattice form and pivotally riveted together at their ends and centers or points of intersection, as shown. At one end the lazy-tongs is attached to a bracket  $i$ , rigidly mounted on one end of the frames D in the drawings, and at the other end is provided with a fork  $k$ , which engages and is adapted to slide freely upon a quadrant or curved guide-bar  $k'$ , rigidly mounted upon the opposite frame D'. This construction, while connecting the two frames, per-



mits the independent vertical movements thereof hereinbefore described.

To the highest part of the arch  $b'$  of the axle B is attached a horizontal lengthwise bar  $m$  by means of the socket  $m'$ , formed in half-sections clamped upon the axle by the bolt  $m^2$ , which passes through a perforation  $m^3$  in the end of the bar received within the cavity  $m^4$  of the socket. The said cavity is made sufficiently larger than the bar to permit a slight movement of the bar laterally for the purpose hereinafter described. The rear end of the bar  $m$  is connected to the central joint of the lazy-tongs by the rivet  $n$  thereof, and in operation this construction insures the following result, viz: The movement of either of the frames D D' laterally will cause the equal and opposite movement of the other frame with respect to a central longitudinal line at right angles to the axis of the wheels, whereby the opening or closing of the frames to pass the weeding-hoes around the individual plants of the row that is being cultivated in no wise affects or disturbs the true position of the wheels and axle with reference to the line of motion. Strictly, such would be the case were the bar  $m$  rigidly connected to the axle; but its play in the cavity  $m^4$  of the socket  $m'$  permits a slight motion of the axle away from a position at right angles to the central line between the frames, and thus allows the machine to be readily guided by pushing either of the frames ahead of the other. This feature of the device is important, as without it the cultivator could be steered only by swinging the weeding-hoes to one side of the row of plants, which is impracticable. A small amount of play of the bar  $m$  in relation to the axle is sufficient for the purpose. The fork  $k$  is secured upon a stem  $r$ , of which it may be considered an integral part, and connected to the lazy-tongs by the rivet  $r'$  of the end joint thereof. Said stem passes under the bar  $m$  and central pivot  $n$  of the lazy-tongs, and a cap  $u$  is riveted to the bar  $m$  under the stem  $r$ , the rivet passing through washers  $u'$  at each side of the stem, as shown, whereby the stem is held in the central longitudinal plane of the lazy-tongs and the fork thus kept in position. The guide-bar  $k'$  is preferably braced by an upright part  $k^2$ , fastened to the frame and the guide-bar.

The handles G are preferably secured to the frames in such manner as to be readily detachable, and the frames may be made of metal or of wood, as may be desired.

The device is simple and cheap in construction, not liable to become out of order, and is well adapted to fulfil the various functions of its design.

I claim as my invention and desire to secure by Letters Patent—

1. In a cultivator the combination of an axle, a pair of wheels mounted thereon, a pair of hoe-frames coupled to the axle, and double-section lazy-tongs connected at the

end joints with the said sections and supported at the center joint from the axle, substantially as and for the purpose specified.

2. In a cultivator the combination of an axle, a pair of wheels mounted thereon, a pair of hoe-frames coupled to the axle and adapted to lateral vibration relative to the axis thereof and provided with operating-handles, lazy-tongs of two sections connected at the ends to the hoe-frames, and having the central pivotal joint supported from the axle, substantially in the manner and for the purpose specified.

3. In a cultivator the combination of an axle, a pair of wheels mounted thereon, a pair of hoe-frames coupled to the axle and adapted to lateral and vertical vibration relative to the axis thereof, handles mounted on said frames, a central support mounted on the axle, and lazy-tongs of two sections connected at the ends with the hoe-frames, and having the central pivotal joint mounted on said support, substantially as and for the purpose specified.

4. In a cultivator the combination of an axle having a central arch, a pair of wheels mounted on the axle, a pair of hoe-frames coupled to the axle and adapted to universal vibration relative to the axis, handles mounted on said frames, a central support mounted on said arch, lazy-tongs of two sections connected at the end joints to the frames and at its central joint from said support, whereby a limited motion parallel to the axis is permitted said central joint.

5. In a cultivator the combination of an axle provided with a central upwardly-curved arch, wheels mounted on the axle, a pair of hoe-frames coupled to the axle and adapted to universal vibration relative to the axis, handles mounted on said frame, a central support mounted on the axle-arch, a guide-bar mounted on one of the frames, a bracket mounted on the opposite frame, and lazy-tongs of two sections movably supported at the central joint from said support and adapted to a limited movement transversely of the cultivator, one end of the tongs being hinged to the said bracket and the other movably engaging the guide-bar, substantially in the manner and for the purpose specified.

6. In a cultivator the combination of an axle having a central upwardly-curved arch, a pair of wheels mounted on the axle, a pair of hoe-frames coupled to the axle, one being hinged or pivoted thereto, and the other coupled thereto by means of a universal joint, lazy-tongs of two sections supported at the central joint from the axle and adapted to a limited movement parallel therewith, and having the end joints connected to the hoe-frames substantially as and for the purpose specified.

7. In a cultivator the combination of the axle B having the arch  $b'$ , the support  $m$  mounted on the arch, the wheels A journaled



on the axle, the casting  $d'$  and cap  $d^2$  clamped  
on one part of the axle, the casting  $e^2$  jour-  
naled upon the axle, the frames D and D'  
hinged to said castings, the bracket  $i$  mount-  
5 ed on one frame, the guide-bar  $k'$  mounted on  
the opposite frame, and the double-section  
lazy-tongs having one end pivoted to said  
bracket, its center pivoted to the support, and  
its opposite end movably engaging the guide-  
bar, the frames being provided with hoes and 10  
handles, substantially in the manner and for  
the purpose specified.

HERBERT RUSSELL FOWLER.

Witnesses:

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MARY E. BARNES.