

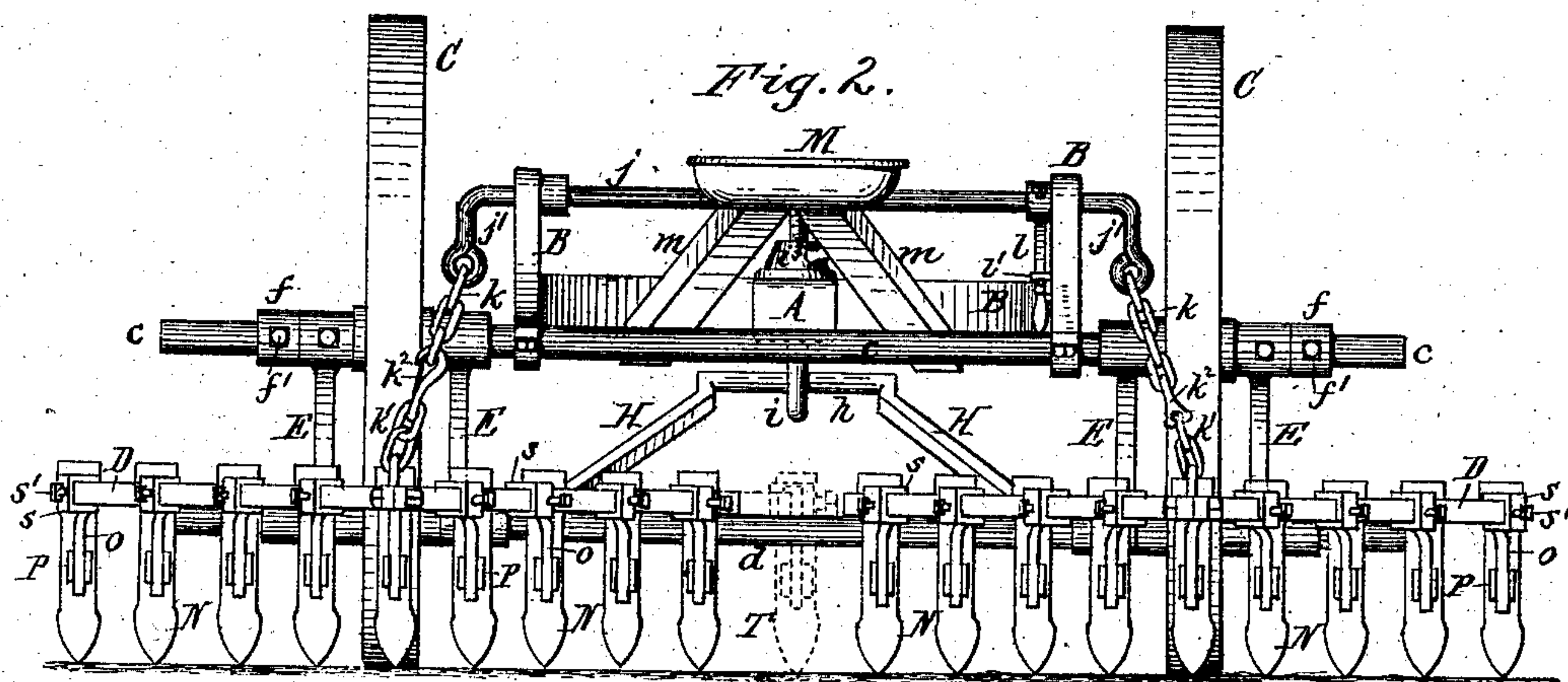
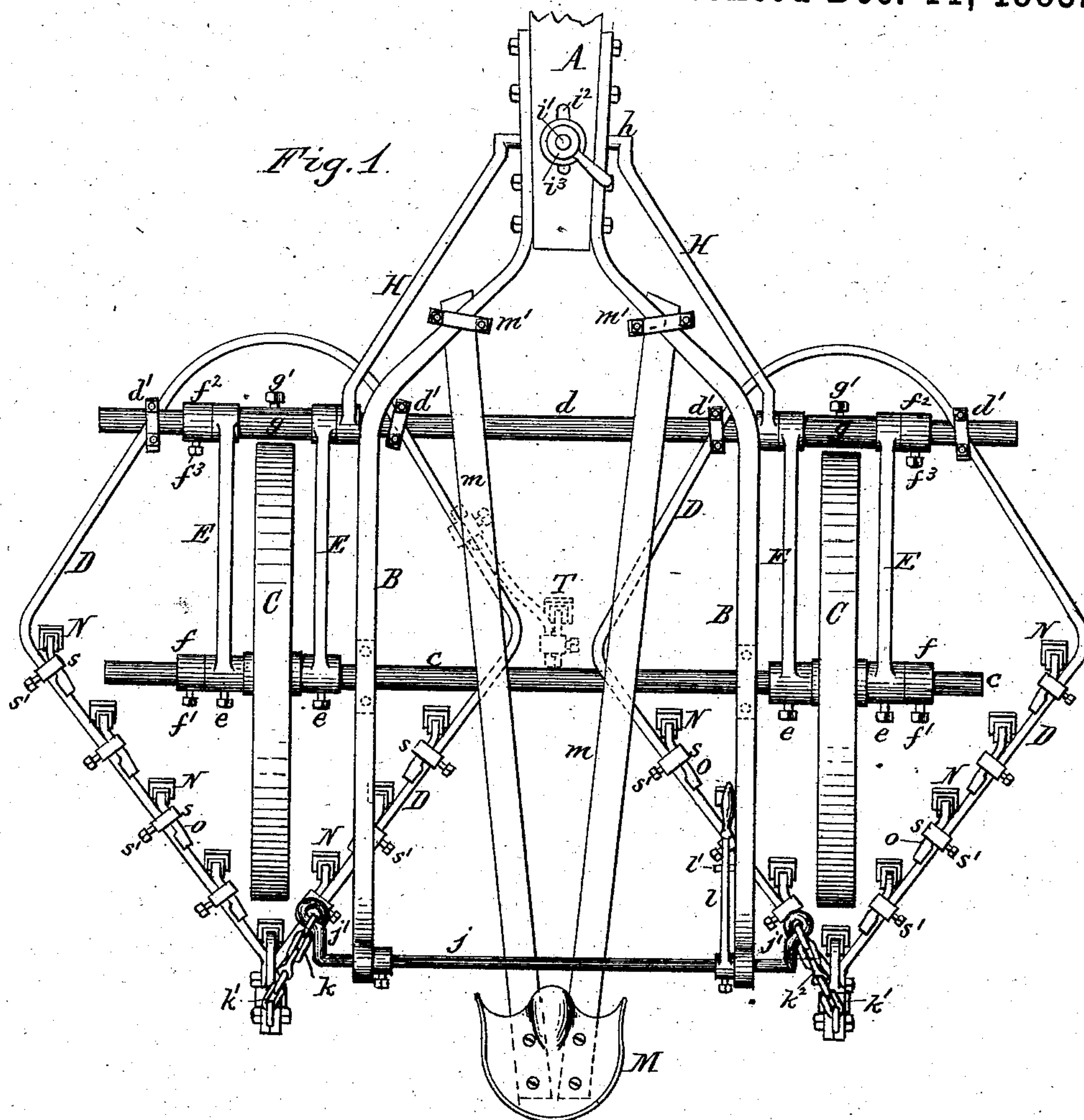
(No Model.)

2 Sheets—Sheet 1.

H. IVES.
CULTIVATOR.

No. 290,059.

Patented Dec. 11, 1883.



Edw. J. Brady.
Theo. L. Popp. Witnesses.

Henry Ives Inventor.
By Wilhelm & Bonner Attorneys.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

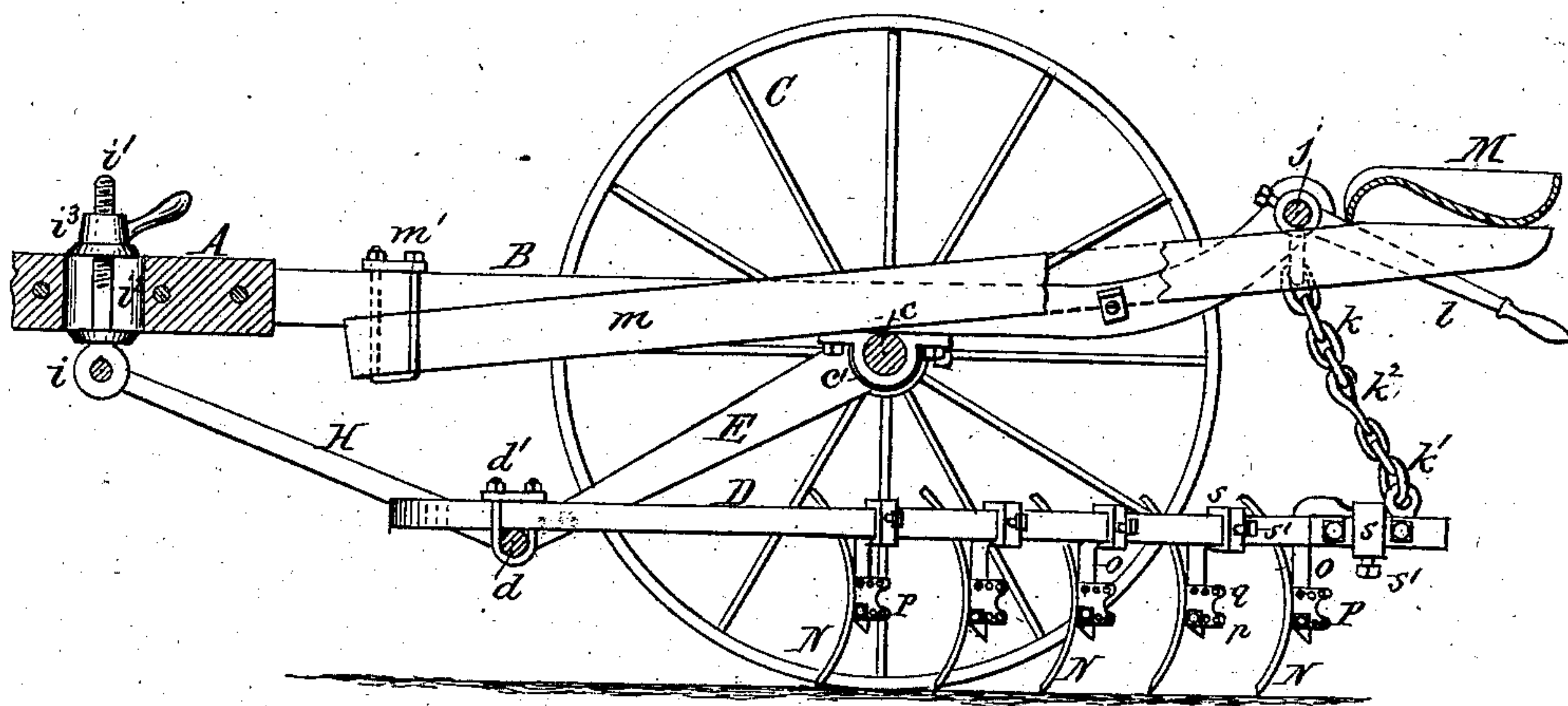


Fig. 4.

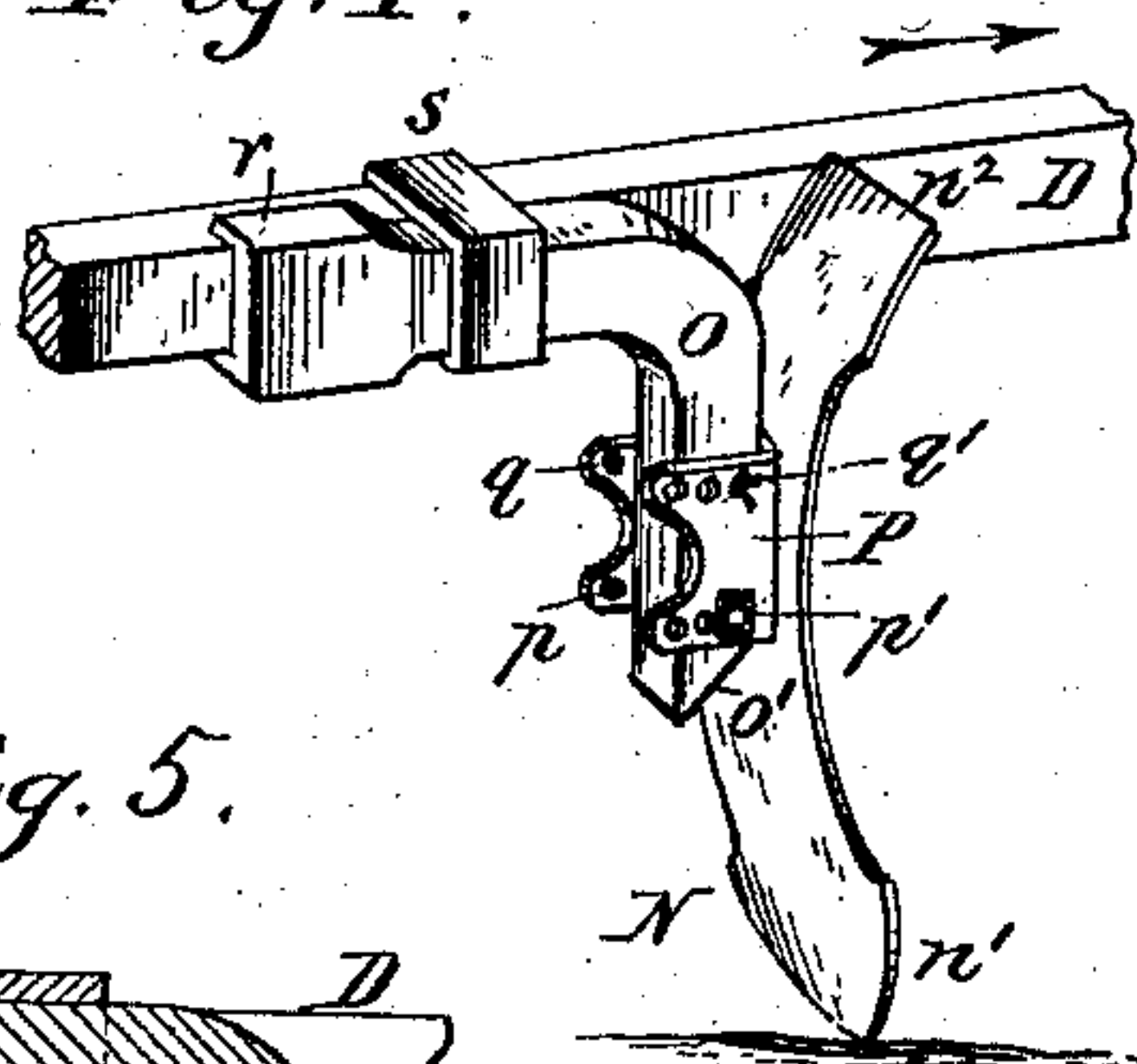


Fig. 6.

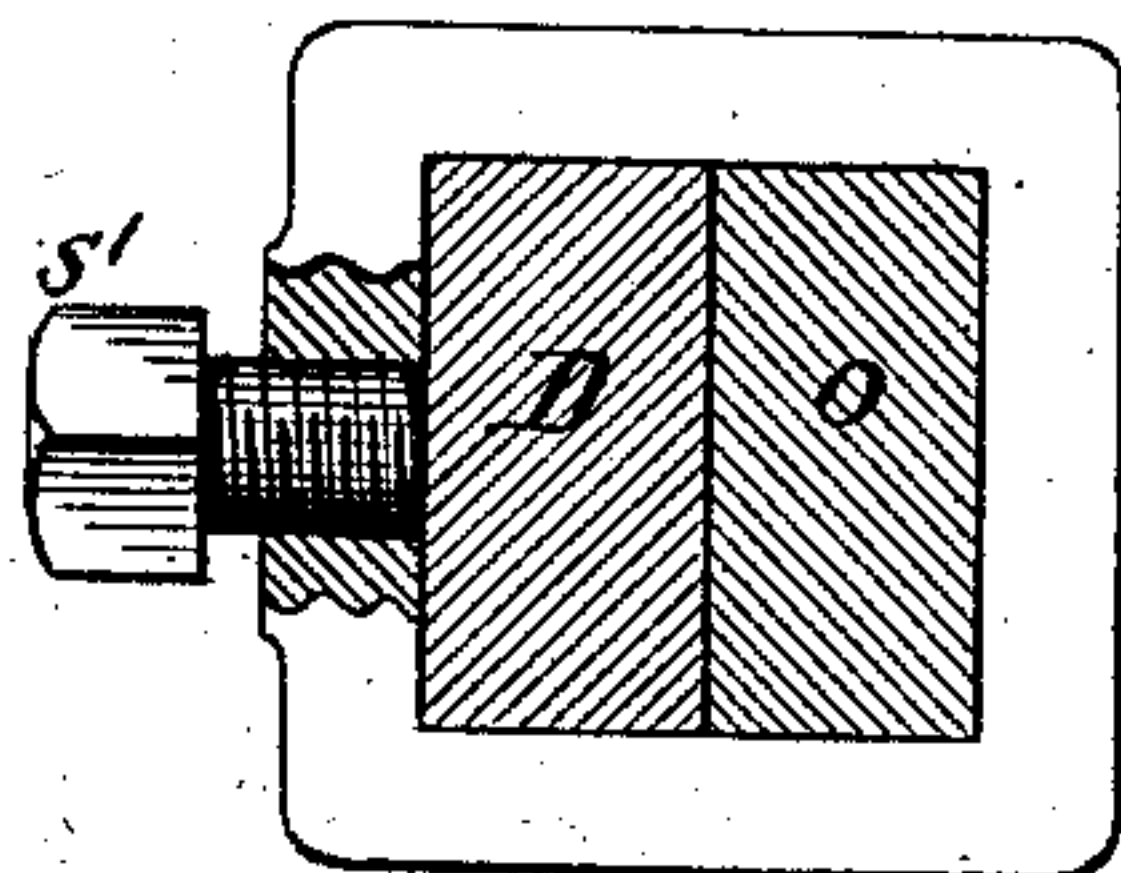


Fig. 5.

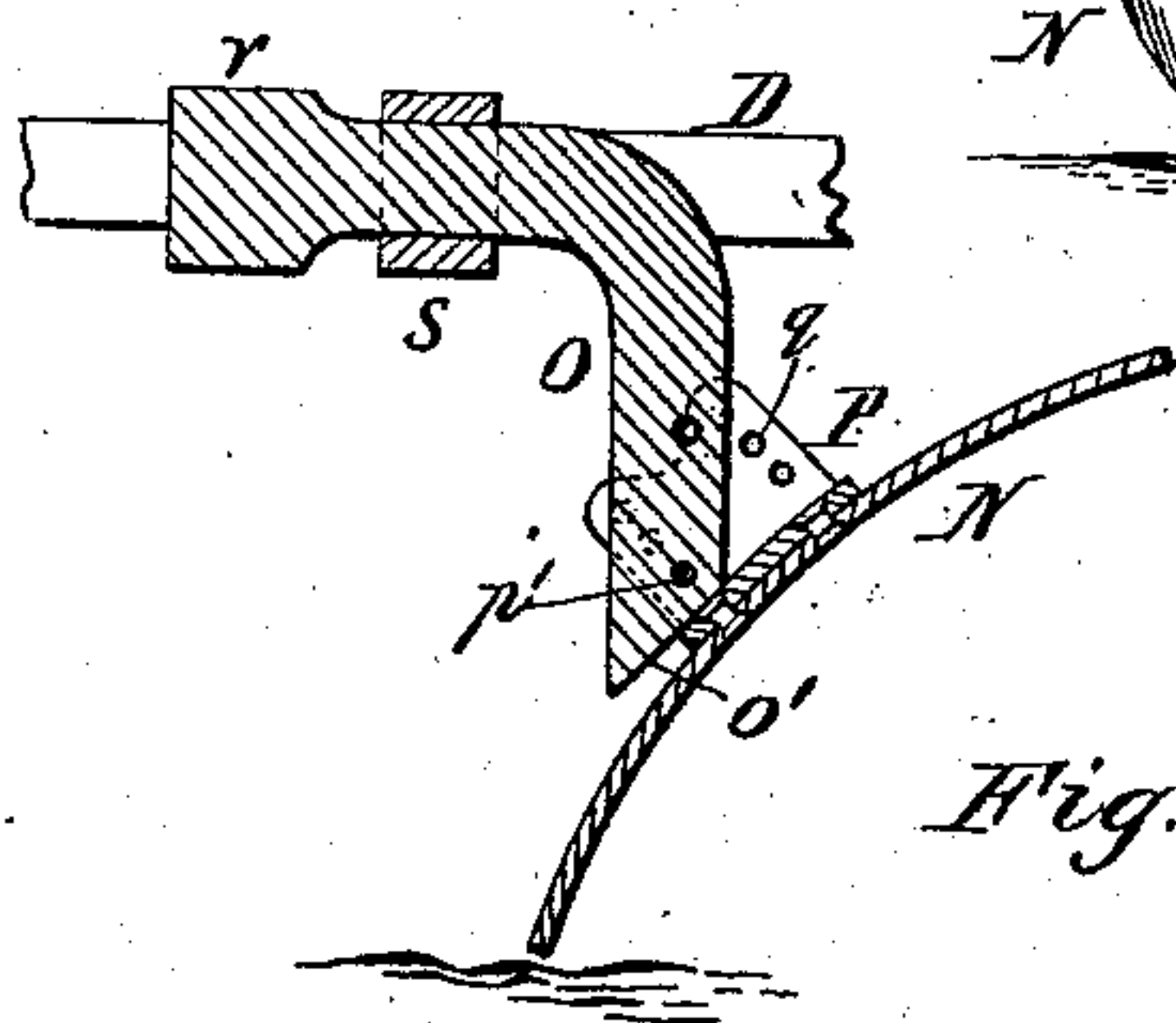


Fig. 8.

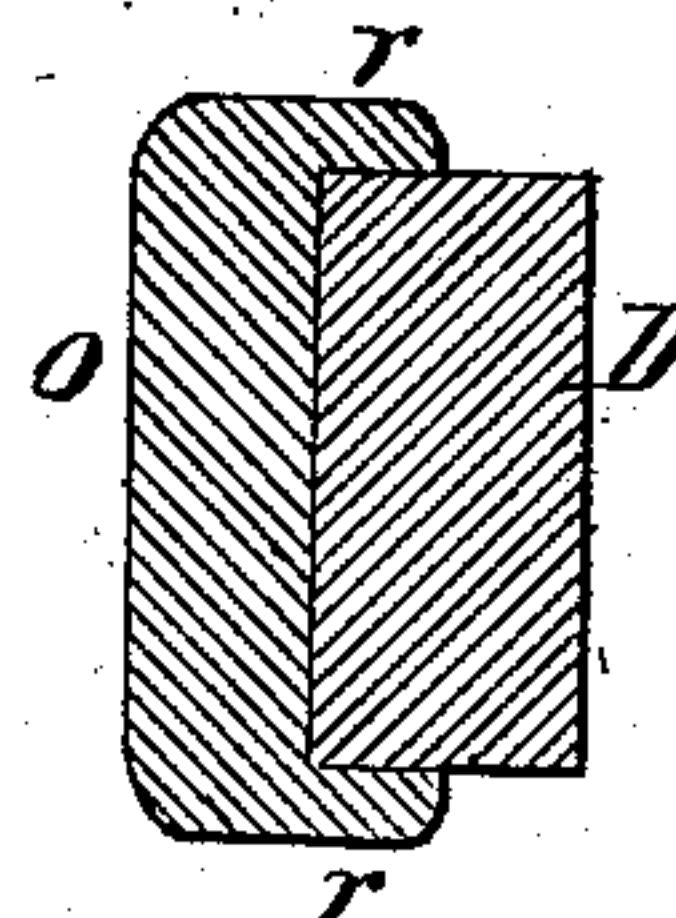
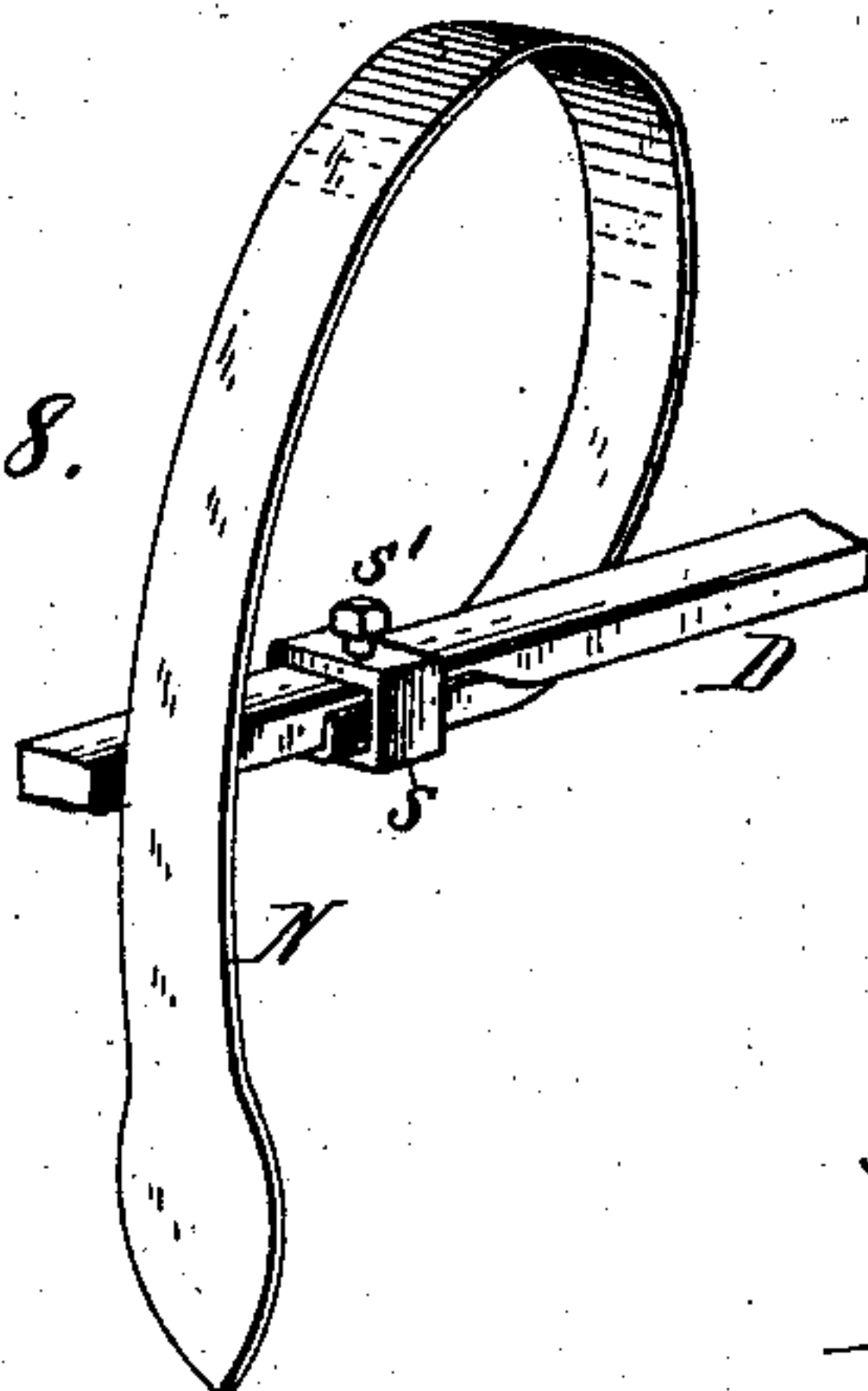


Fig. 7.

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UNITED STATES PATENT OFFICE.

HENRY IVES, OF BATAVIA, NEW YORK, ASSIGNOR OF ONE-HALF TO HENRY EASTON, OF SAME PLACE.

CULTIVATOR.

SPECIFICATION forming part of Letters Patent No. 290,059, dated December 11, 1883.

Application filed March 15, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY IVES, of Batavia, in the county of Genesee and State of New York, have invented a new and useful Improvement in Cultivators, of which the following is a specification.

This invention relates to an improvement in the construction of wheel or sulky cultivators; and it consists in a novel arrangement of the teeth, whereby, in cultivating between the rows of plants, the first tooth is arranged nearest the row of plants and the succeeding teeth are farther and farther removed from the plants; also, of a novel mechanism for adjusting the height of the frame which carries the teeth, and for supporting the teeth when elevated from the ground; also, of the means whereby the teeth are adjustably secured to the supporting-frame, and of the peculiar construction of the parts, whereby the sets of teeth are made laterally adjustable to adapt the machine to operate between rows arranged at varying distances apart, as will be hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, consisting of two sheets, Figure 1 is a top plan view of a machine provided with my improvements. Fig. 2 is a rear elevation thereof. Fig. 3 is a central longitudinal section of the machine. Fig. 4 is a perspective view of one of the teeth and its fastening device on an enlarged scale. Fig. 5 is a sectional elevation of one of the teeth and connecting parts. Figs. 6 and 7 are cross-sections, on an enlarged scale, in lines x and y , Fig. 5, respectively. Fig. 8 is a perspective view representing a spring-tooth provided with my improved fastening devices.

Like letters of reference refer to like parts in the several figures.

A represents the draft-pole, and BB the side pieces of the frame of the machine, secured with its forward ends to the draft-pole. c is the axle, and CC are the wheels turning loosely on the same. The axle c turns in bearings c' , secured to the under sides of the side pieces, B, of the frame of the machine.

DD represent the frames to which the cultivator-teeth are attached. The rear portion of each frame is composed of two bars or parts arranged at an angle to each other, the apex

of the angle being arranged at the rear end of the machine, and the distended front ends of the bars being arranged forwardly. The distended front ends of the rear bars of each frame are connected by two forwardly-converging bars, and the four bars of each frame may be formed of a single piece of bar-iron bent to the proper form, and having its ends secured together at the apex or rear end of the frame, as represented in Fig. 1. The frames D are attached, near their front ends, to a horizontal shaft, d , which is connected with the axle c by hangers or rods E, arranged on both sides of the wheels. The frames D are secured to the shaft d by clips d' . The hangers or rods E are secured to the axle c by set-screws e , and are held on the axle against outward movement by a collar, f , provided with a set-screw, f' . A similar collar, f^2 , is secured by a set-screw, f^3 , to the shaft d , on the outer side of the outer hanger, E, of each pair, and the front ends of both hangers embracing the same wheel are held at the proper distance apart by a sleeve, g , arranged upon the shaft d , between the front ends of the hangers E, and secured to the shaft by a set-screw, g' .

HH represent two braces provided at their rear ends with eyes through which the shaft d passes, and which are arranged on the inner sides of the hangers E. The front ends of the braces H are connected by a horizontal rod, h , which passes through the eye i of a vertical bolt, i' , which is adjustably attached to the draft-pole A. The bolt i' passes through a longitudinal slot, i^2 , in the draft-pole, and is secured in position by a thumb-nut, i^3 . Upon moving the bolt i' backwardly in the slot i^2 the front ends of the frames D are lowered, and by an adjustment of the bolt i' in an opposite direction the front ends of the frames D are raised.

j represents a horizontal transverse shaft, which is supported in the rear ends of the side frames, B, and provided at each end with a crank, j' .

k represents a short chain attached to each of the cranks j' , and k' is a similar chain attached to the rear end of each frame D, and provided at its upper end with a snap-hook, k^2 , which can be engaged with either of the

links of the upper chain, *k*. By raising or lowering the snap-hook on the upper chain, *k*, the rear end of each of the frames D is raised or lowered accordingly.

5 *l* represents a hand-lever secured to the shaft *j*, on the inner side of one of the side frames, B, for turning the shaft, so as to raise or lower the rear ends of the frame D. The cranks *j'* are so arranged on the shaft *j* with reference to the lever *l* that upon swinging the lever forward, in order to raise the rear ends of the frame D from the ground, the cranks will pass beyond the perpendicular position before the lever comes in contact with the supporting-
10 stop *l'*, formed on the adjacent side frame, B, so that when the lever rests on the stop *l'* the weight of the frames D and the parts attached thereto, suspended by the chains *k k'*, will tend to hold the lever *l* against the stop *l'*, and thus
15 secure the frame in an elevated position without any further locking device.

m m represent the bars which support the seat M. These bars are secured at their front ends to the side frames, B, by clips *m'*, and rest
25 upon the axle *c* and against the under side of the shaft *j*, as clearly shown in Figs. 1 and 3.

N represents the teeth of the cultivator, which are secured to the frame D by means of curved arms *o*, to which the teeth are pivoted, and which are adjustably secured to the frames D. The teeth N are provided at their rear
30 sides with a bifurcated bearing, P, embracing the downwardly-projecting portion of the arm *o*, and provided with two series of openings, *p* and *q*.
35 *p* and *q*.

p' represents a pivot-bolt, which is passed through one of the lower openings, *p*, and a corresponding opening in the arm *o*, and *q'* represents a safety-pin, which passes through
40 one of the upper openings, *q*, and a corresponding opening in the arm *o*. The tooth is in this manner pivoted to the arm *o* by the bolt *p'* and held at the desired inclination by the safety-pin *q'*. When the tooth strikes an ob-
45 struction which overcomes the resistance of the safety-pin *q'*, the latter is broken and the lower end of the tooth is swung backward, so as to ride over the obstruction until the back of the tooth comes in contact with the beveled
50 lower end, *o'*, of the arm *o*, which forms a stop for the tooth and arrests the backward movement of the lower end of the tooth.

When it is desired to employ the machine as a smoothing-harrow, all the teeth may be
55 adjusted in this position, as represented in Fig. 4. Each tooth is formed with a sharp point, *n'*, at one end, and with a straight edge, *n''*, at its opposite end. The latter is used for cutting weeds, &c., and the former for scarify-
60 ing the ground. The teeth are readily reversed, so as to bring either of the ends downward at desire, by removing the bolt *p'* and safety-pin *q'* and reversing the tooth and replacing these parts, and the inclination of the
65 teeth is regulated by moving the bolt *p'* and the safety-pin *q'* backwardly or forwardly in

their respective series of holes, as may be necessary. The horizontal portion of the arm *o* is fitted against the inner side of the frame D, and provided at its end with two lips or flanges, *r*, which overlap the upper and lower sides of the frame D, and which prevent the vertical movement of the arm *o* on the frame. The arm *o* is secured to the frame by a clamp or loop, *s*, which incloses the arm and the frame, 70 and which is secured in place by a set-screw, *s'*, on the outer side of the frame. Upon loosening the set-screw *s'* the clamps *s* and the arm *o* can be adjusted forwardly and backwardly on the frame D to any desired position, in which 80 they are readily secured by tightening the set-screw *s'*. This fastening does not require the frames D to be perforated, which would weaken the frames. It permits a very fine adjustment of the teeth on the frame, and does 85 not present any projecting parts, which are apt to be injured or cut away in course of time by the material upon which the teeth operate. The same fastening may also be applied to spring-teeth, as represented in Fig. 8, in which 90 case the tooth-supporting shank or arm and the tooth are formed in one piece. The tooth-supporting arm *o* of the tooth at the apex or rear end of the frame B is rigidly secured be-
95 tween the rear ends of the bar of which the frame D is composed by bolts passing through the ends of this bar and the tooth-supporting arm *o*, as indicated in Fig. 1.

The teeth N are arranged on the inner sides of the frames D, the front teeth being farthest 100 apart and nearest the rows of plants, and the succeeding teeth approach each other until the apex at the rear end of the frame is reached. The wheels travel within the frame D and in front of the teeth. By this arrangement of 105 the teeth the furrow formed by the front tooth near the roots of the plants in the rows is covered by the ground displaced by the next following tooth, and so on through the entire row of teeth from the outer front tooth to the 110 tooth at the apex or rear end of the frame D, and the furrow formed by the last tooth at or near the apex is left uncovered. As this furrow is formed midway between two rows of plants, the fact that it remains uncovered is 115 of no importance. By a reverse arrangement of the teeth, which is the ordinary arrangement, the apex of the angular rows of teeth is arranged forwardly, and the last teeth in each row are the teeth nearest the rows of plants, 120 and the furrows formed by these last teeth in close proximity to the roots of the plants remain uncovered, which is very objectionable. In my improved machine the teeth extend farther out than the wheels, whereby the outer 125 teeth can be run close to the rows of plants, and the teeth follow the wheels as the machine passes over the ground, and scarify and loosen the ground after the wheels have passed over the same. The frames D, wheels, and connect- 130 ing parts can be laterally adjusted in an obvious manner on the axle *c* and shaft *d*, when

required, in order to adjust the machine to varying distances between the rows of plants.

When it is desired to use the machine for ordinary field-work, a central tooth, T, is secured to one of the frames D, as shown in dotted lines in Figs. 1 and 2, so as to fill the space between the two sets of teeth which is occupied by the row of plants in cultivating between the rows.

10 I claim as my invention—

1. The combination, with the axle *c*, wheels C, frames B, and pole A, provided with an elongated opening, *i*², of the tooth-supporting frames D, shaft *d*, to which the front ends of the frames D are attached, braces H, attached
15 with their rear ends to the shaft *d*, and bolt *i*', whereby the front ends of the braces H are adjustably connected to the pole, substantially as set forth.

20 2. The combination, with the frames B, shaft *e*, and wheels C, of the tooth-supporting frames D, surrounding the wheels, shaft *d*, connected with the front ends of the frames D, hangers E, whereby the shaft *d* is connected with the
25 axle *c*, and braces H, whereby the shaft *d* is

connected with the pole, substantially as set forth.

3. The combination, with a tooth-supporting frame, of a tooth-supporting arm or shank constructed with lips *r*, overlapping two sides
30 of the frame, and a clamp or loop, *s*, surrounding the frame and the tooth-supporting shank, and means whereby the clamp is adjustably secured in place, substantially as set forth.

4. The combination, with a tooth-supporting
35 arm, *o*, provided with a beveled lower end, *o*', of a tooth, N, provided with a bearing, *n*, and a pivot-bolt, *p*', whereby the tooth is attached to the arm *o*, substantially as set forth.

5. The combination, with a tooth-supporting
40 arm, *o*, of a tooth, N, provided with a bearing, P, having two rows of openings, *p* and *q*, and a pivot-bolt, *p*', and a safety-pin, *q*', whereby the tooth is attached to the tooth-supporting arm, substantially as set forth.

HENRY IVES.

Witnesses:

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SAFFORD E. NORTH.