

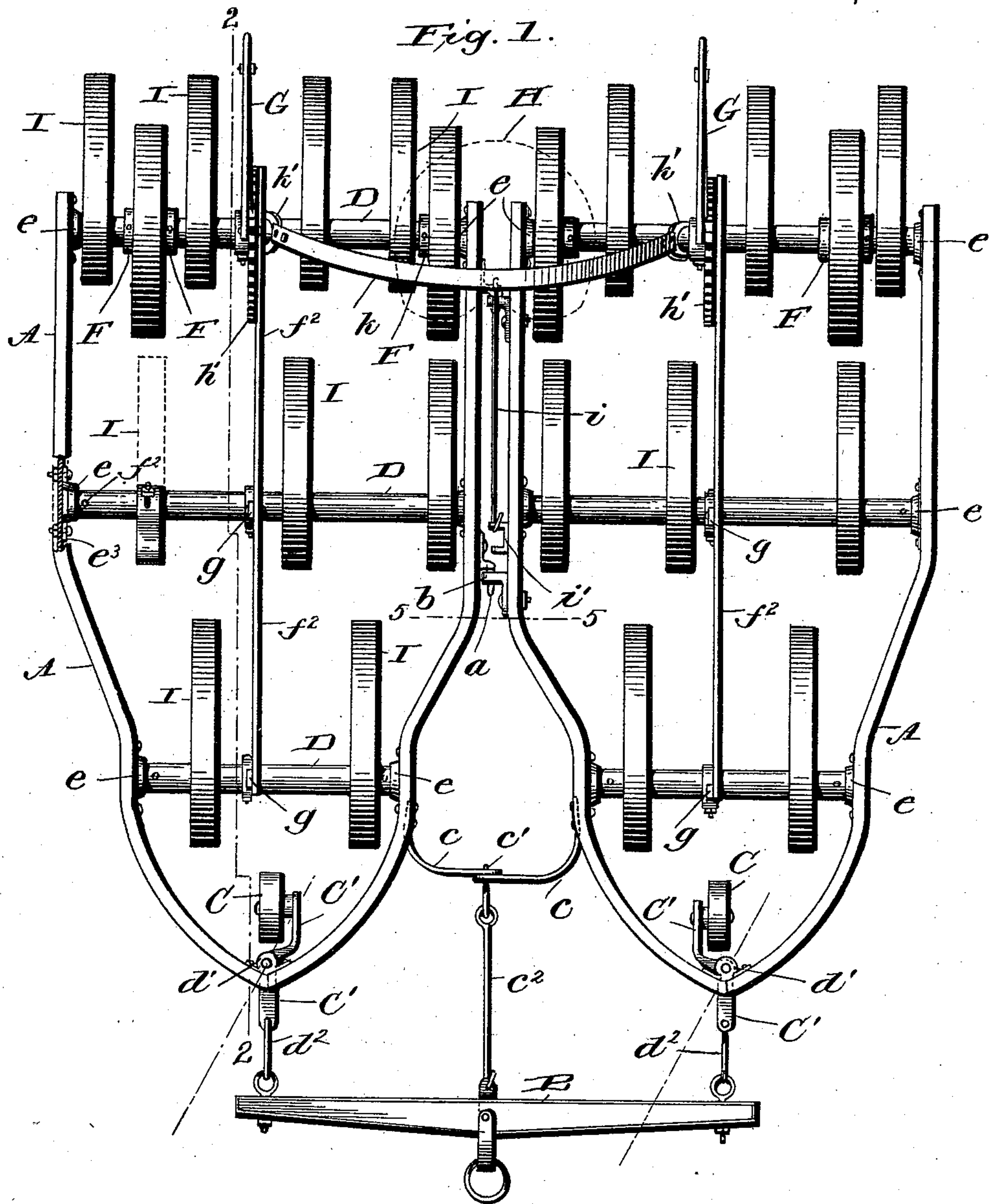
(No Model.)

3 Sheets—Sheet 1.

S. N. HENCH & W. A. DROMGOLD.
HARROW.

No. 540,618.

Patented June 4, 1895.



Witnesses:

L. C. Hills

J. B. Keefe

Inventors:

Samuel N. Hench,

Walker A. Dromgold.

by Marshall Bailey
their Atty.

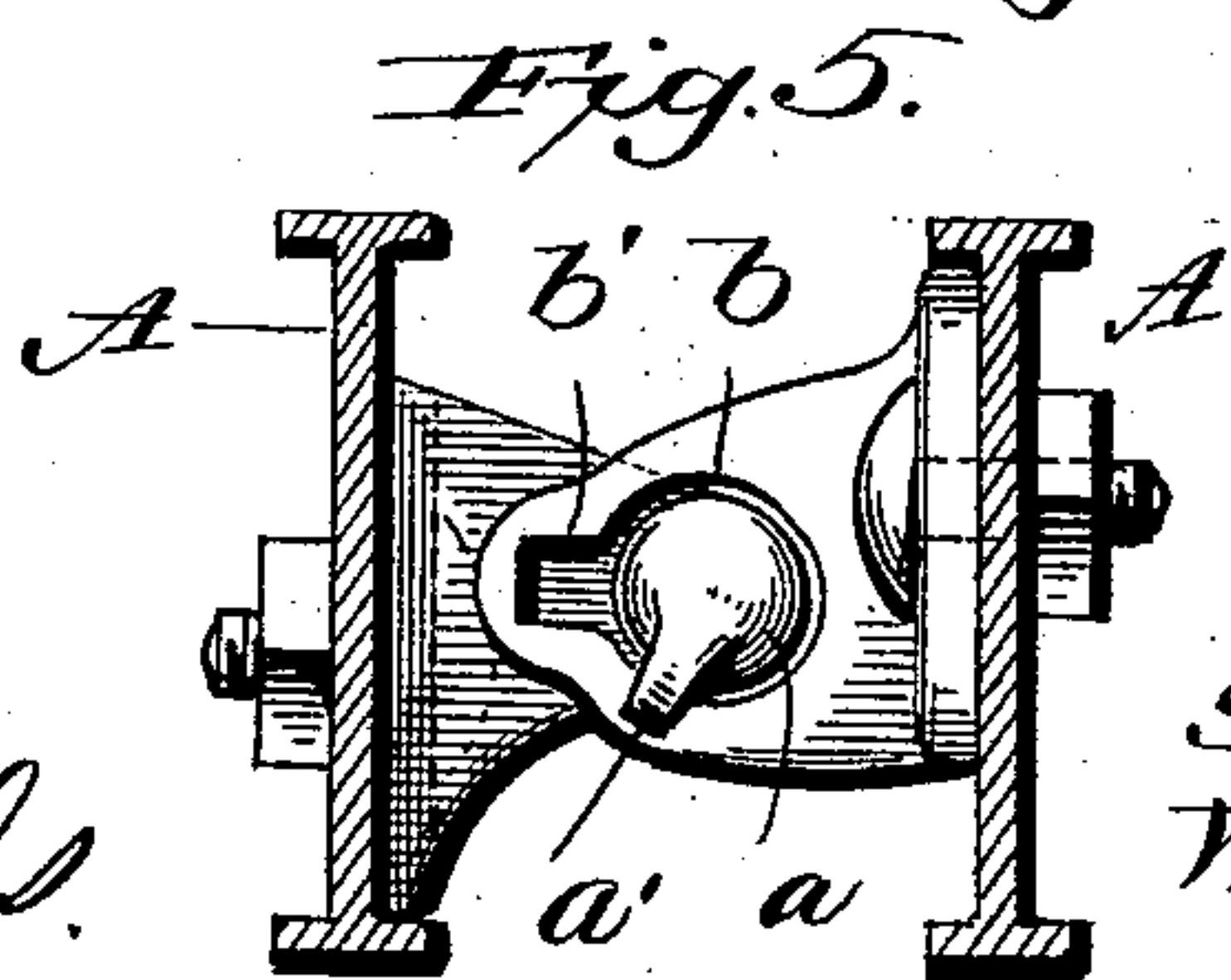
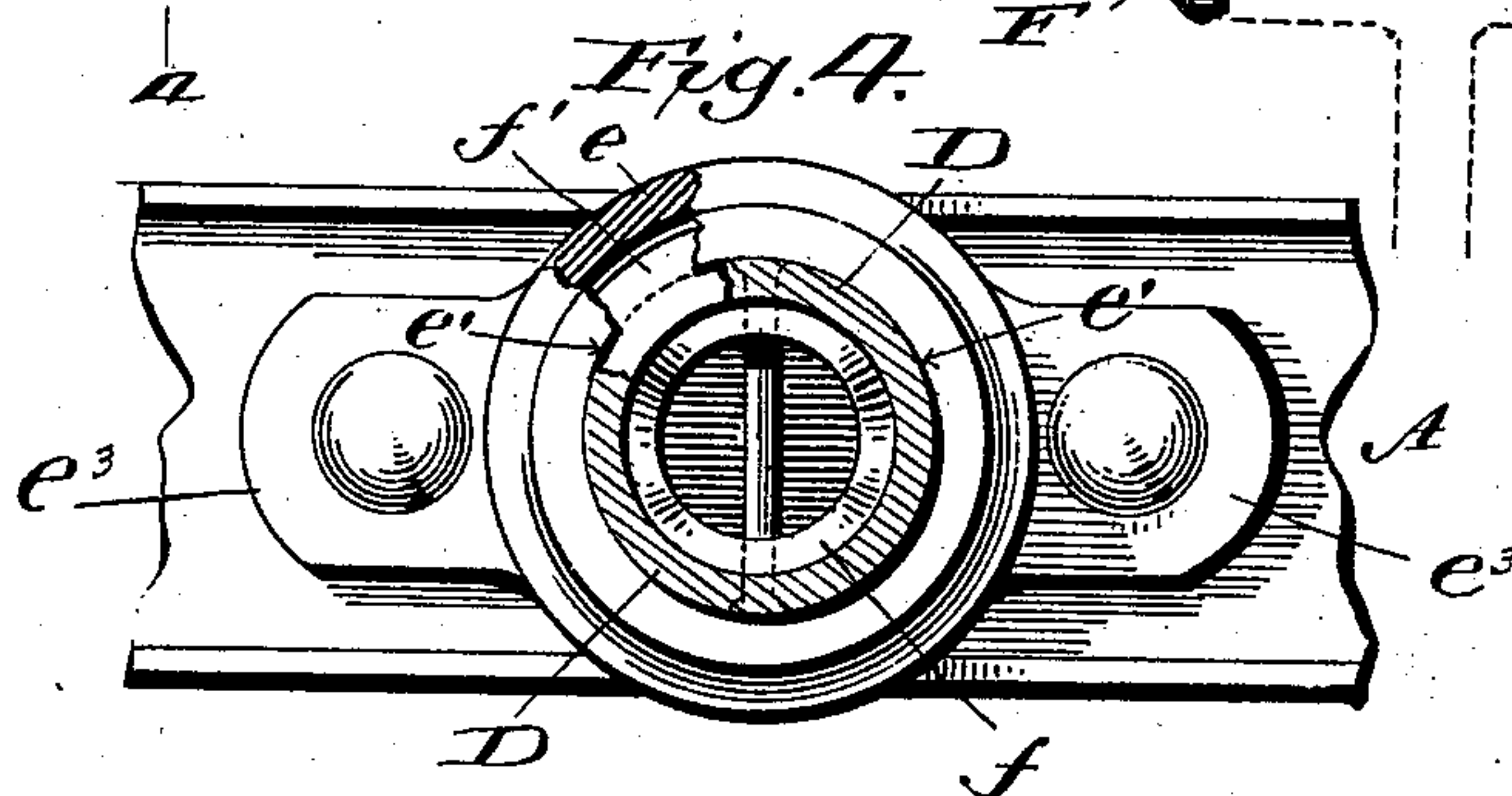
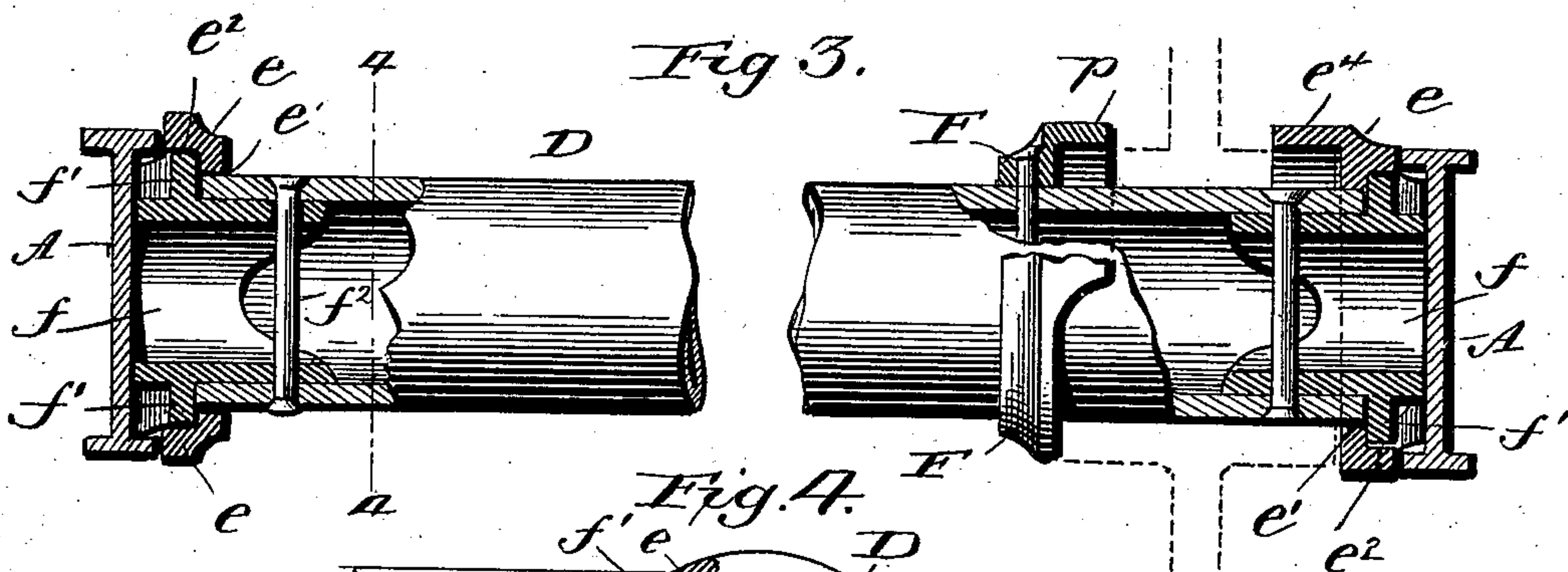
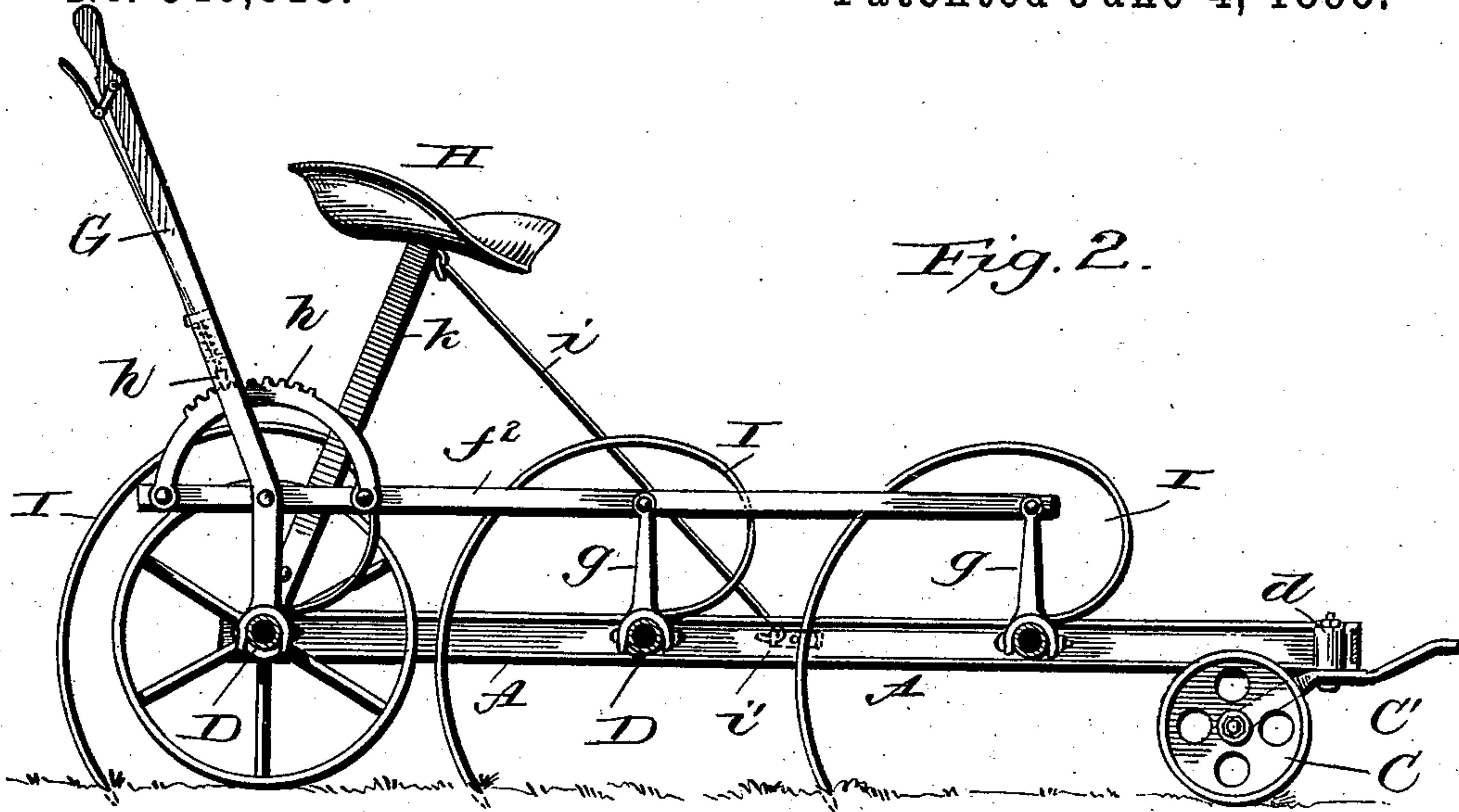
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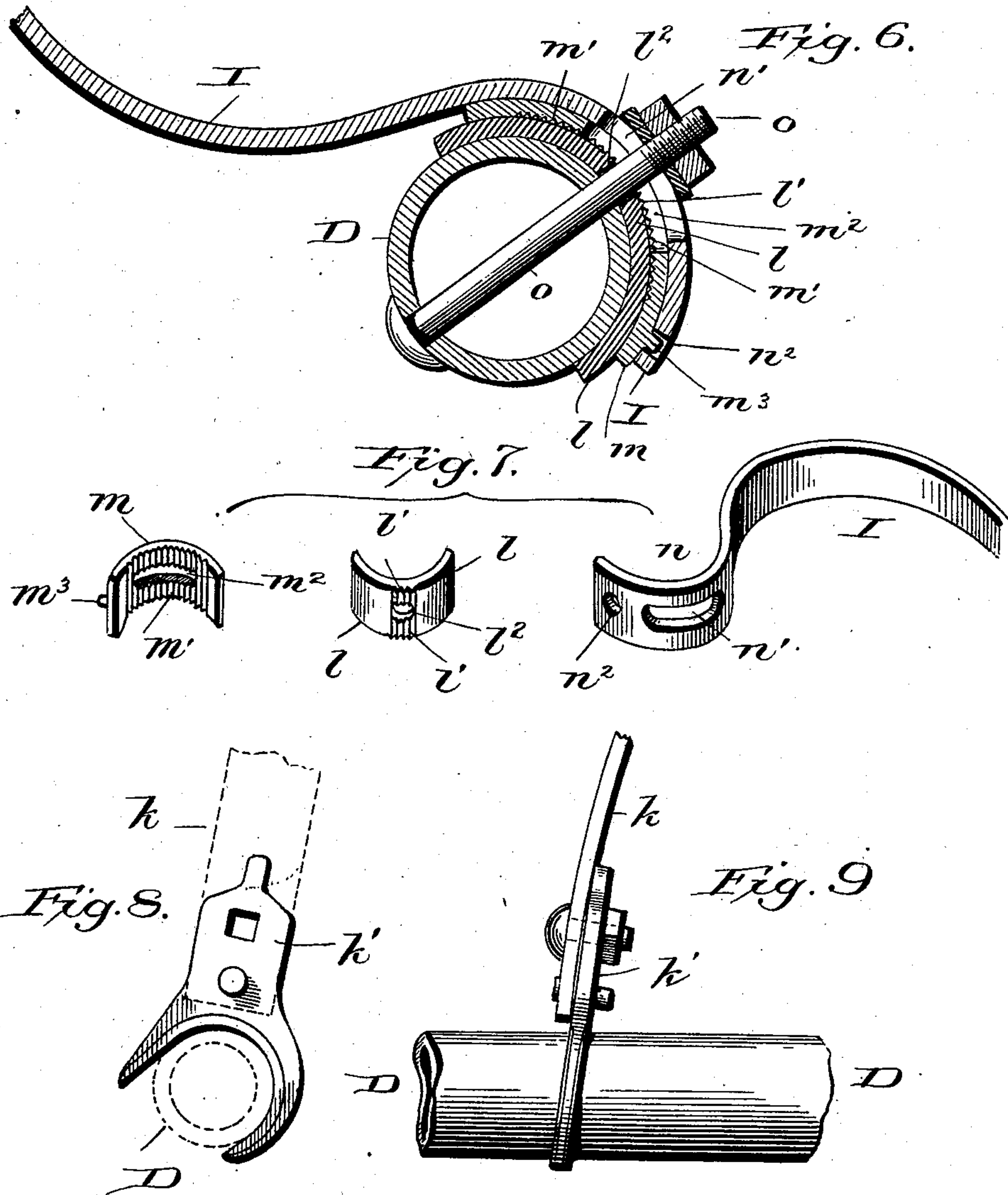
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3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

SAMUEL N. HENCH AND WALKER A. DROMGOLD, OF YORK, PENNSYLVANIA.

HARROW.

SPECIFICATION forming part of Letters Patent No. 540,618, dated June 4, 1895.

Application filed January 14, 1895. Serial No. 534,900. (No model.)

To all whom it may concern:

Be it known that we, SAMUEL N. HENCH and WALKER A. DROMGOLD, citizens of the United States, and residents of York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Harrows, of which the following is a specification.

Our invention consists of certain improvements in harrows, which will first be explained by reference to the accompanying drawings, forming part of this specification, and will then be more specifically pointed out in the claims.

In the drawings, Figure 1 is a plan of the harrow. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is an enlarged longitudinal section, partly in elevation, of one of the axles and devices for journaling it in the frame. Fig. 4 is a section on line 4 4, Fig. 3. Fig. 5 is a sectional elevation of the hinge between the two frame-sections. Fig. 6 is a section through the axle and spring-tooth holder. Fig. 7 is a view of the various members of the holder. Figs. 8 and 9 are views of one of the forked lower ends of the seat-supporting bow-spring.

The harrow shown in the drawings and embodying our improvements in their preferred form, is a wheel harrow of the spring-tooth type, with the teeth fastened upon axles journaled in the frame, and the frame itself divided longitudinally into two parts hinged together upon a horizontal axis.

The two part harrow frame is made of steel beams or bars of I-shape in cross-section. The two parts A A of the frame are hinged together by means of pins *a* on the one, and sockets or eyes *b* on the other. Each pin at its end has a lateral offset or lug *a'*, and the socket or eye piece is correspondingly formed with a lateral slot *b'* for the passage of this lug. The parts are so placed that in order to permit the pins to pass through the eyes, one section of the harrow must be turned up vertically at right angles to the other. Then after the pins enter the eyes, the raised harrow section is turned down level with the other. This brings the lugs *a'* out of register with the slots *b'*, thus securely locking the harrow sections together, while permitting them all necessary movement independent of

each other. The hinge in fact, is a species of bayonet joint.

At the front of the frame are the two straps *c* secured to the interior opposite faces of the sections with their ends projecting toward each other and overlapping. These ends are fastened together by the hinge pin or bolt *c'* to which is hooked the coupling rod *c²*, this rod at its other end being hooked or coupled to the center of the draft or evener bar B.

There is a front wheel C for each section of the harrow. Each wheel is mounted in one end of a bracket arm C' secured between its two ends upon a vertical spindle swiveled in a bearing iron *d'* attached to the harrow frame. The outer end of the bracket arm is hooked or coupled to the end of the evener bar at *d²*. By this arrangement the harrow is steadied and the turning of the harrow is facilitated, the team by their draft upon the evener bar in turning, swinging the front wheels in a direction to facilitate this operation.

The tooth supporting axles are shown at D. They are made preferably of steel tubing and at their ends are journaled in the side beams of the harrow sections. They are thus journaled by means of socket irons *e*, and flanged ferrules *f*. The socket iron *e*, in its inner face has a cylindrical opening *e'* of a size to fit around and afford a bearing for the end of the axle D which it is to support; and back of this opening it has an enlarged cylindrical recess *e²* to receive the flange *f'* of the ferrule. In fitting the parts together, the ferrule is first passed through the socket iron from the outer face thereof until its flange *f'* brings up in the recess *e²*. Then the ferrule is driven into the end of the tubular axle D, until the end of the axle enters and is seated in the bearing *e'*. Then the ferrule is riveted to the axle as at *f²*. After this the socket irons are bolted by their ears *e³* to the interior opposite faces of the frame and the axle is held securely in place while free to rotate in the socket irons. The flanged ferrules serve to hold all the parts together and to prevent the side beams of the frame from springing or spreading apart.

The rear wheels, of which there are two for each harrow section, are mounted to revolve upon the rear axles D. They are held in place

by the sand bands F, one on each side of each of them—these bands having the form of washers with flanges *p* on their interior opposite faces to overhang the hub of the wheel, and being bolted or riveted to the axles. In the case however of the inner rear wheels E, each of these wheels immediately adjoins the inner socket iron *e* of its axle. We therefore utilize this iron as a sand band also and for this purpose form it with a sand band flange *e'* overhanging the contiguous portion of the wheel hub.

The axles of each harrow section are rocked, for the purpose of raising and lowering the teeth carried by them, by means of a lever G pivoted or hung to turn upon one of the axles—in this instance the rear axle—and hinged or pinned to a horizontal connecting bar *f* jointed to crank arm *g* on the several axles. The lever is held in adjusted position by the usual spring locking dog *h* carried by it, which engages a toothed sector *h'* on the connecting bar *f*.

The seat H has attached to it a rod *i* which extends forward and diagonally downward between the harrow sections where its front end is hooked or otherwise suitably coupled to an eye piece *i'* swiveled upon a horizontal axis to one of the sections. The seat rests upon and is attached to a stout strap or bar *k* of spring metal bent in bow or arch form and having attached to its ends forked pieces *k'* which straddle and rest upon the rear axles D. These ends are placed upon the axles between the interior opposite faces of the two levers G and are thus prevented from unduly spreading apart. This arrangement does not interfere with the free tilting movement of the harrow sections, since the forked ends of the seat supporting spring will slide lengthwise on the axle toward each other when the upward tilting movement of the section takes place. At the same time the arrangement is such as to permit the seat to be readily applied to and removed from the harrow.

The spring teeth are shown at I. They are individually adjustable upon the axles to which they are attached in order to compensate for wear and for other purposes. The devices by which this capacity for adjustment is secured are as follows: Upon the axle is placed a semi-cylindrical or half round saddle *l* having ratchet teeth *l'* upon its exterior, and a hole *l''* for the passage of the bolt *o* by which it, and indeed all the parts of the joint are held to the axle—the axle also being perforated transversely for the passage of the bolt. Upon the saddle *l*, is placed a matching saddle *m*, provided with internal ratchet teeth *m'* to engage the external teeth *l'* of saddle *l* and also with a longitudinal slot *m''* for the passage of the bolt *o*, this slot being of a length to permit the rotary movement of the exterior saddle requisite for adjusting purposes. The tooth itself at its base is bent into half round form as at *n* to fit upon the exterior saddle, and has a slot *n'* correspond-

ing to that in the saddle. The tooth moreover at its extreme inner end is perforated at *n''* to receive a correspondingly located stud *m''* on the saddle *m*. By this device the tooth and exterior saddle are connected so that they must move together. When the two saddles and the tooth are fitted together and upon the axle, they are held together most firmly and securely by the bolt *o*, as indicated in the drawings.

If at any time it becomes necessary to adjust the tooth, all that is required is to loosen the bolt sufficiently to permit the exterior saddle *m* to be lifted away from the inner saddle *l* the slight distance which will suffice to disengage the ratchets from one another, and then the tooth, together with the outer saddle can be adjusted or rotated upon the inner saddle to the extent permitted by the slots in them. Then by again tightening the bolt, the parts will be rigidly secured in their new positions. This adjusting device can be employed whether the tooth supporting axle is capable or not of rocking or rotary movement.

The saddles preferably are malleable castings.

Having described our improvements and the best way now known to us of carrying the same into effect, what we believe to be new herein, and claim as of our invention, is as follows:

1. In combination with the harrow frame and the evener or draft bar connected centrally to the frame by the tug bar *c'*, the bracket arms C' swiveled to turn upon a vertical axis in the harrow frame, and coupled at their front ends to opposite ends of the evener bar, the evener bar and the wheels C mounted in said bracket arms, substantially as and for the purposes hereinbefore set forth.

2. In a harrow, the combination with the harrow frame and the tooth supporting axles, of socket irons *e* and flanged ferrules *f*, whereby said axles are journaled and secured to the harrow frame, substantially as and for the purposes hereinbefore set forth.

3. In combination with the harrow frame and tooth supporting axles, the seat, the bow spring secured to the seat, and provided with forked ends each straddling and resting upon an axle, and the coupling rod secured at one end to the seat, and extending therefrom diagonally downward toward and secured by its lower end, to the harrow frame, substantially as hereinbefore set forth.

4. In combination with the hinged harrow sections, and tooth supporting axles, the seat, its supporting bow spring secured to the seat and having forked ends which straddle and rest each upon an axle in its appropriate section, and a diagonal coupling rod attached at one end to the seat and at the other end to one of the harrow sections, substantially as and for the purposes hereinbefore set forth.

5. In a spring tooth harrow, the combination with a tooth supporting axle, of an externally ratchet-toothed saddle fitting thereon, an

outer slotted saddle provided with internal ratchet teeth to engage the external teeth on the inner saddle a spring tooth having a correspondingly slotted end mounted on the
5 outer saddle, and a fastening bolt passing through the axle and inner saddle and the slots in the outer saddle and the tooth, substantially as and for the purposes hereinbefore set forth.

10 6. The combination with a tooth supporting axle of an externally ratchet toothed saddle l , mounted on the axle, an outer saddle m mounted on saddle l , provided with an inter-

nal ratchet face m' , a slot m^2 and a stud m^3 , a spring tooth having one of its ends shaped 15 to fit upon the outer saddle and provided at this end with a slot n' and hole n^2 , and the fastening bolt o , substantially as and for the purposes hereinbefore set forth.

In testimony whereof we have hereunto set 20 our hands this 12th day of January, 1885.

SAMUEL N. HENCH.

WALKER A. DROMGOLD.

Witnesses:

ROBERT J. LEWIS,

JOHN A. HOOBER.