

(No Model.)

3 Sheets—Sheet 1.

A. L. STANFORD.

LIFTING JACK.

No. 389,861.

Patented Sept. 18, 1888.

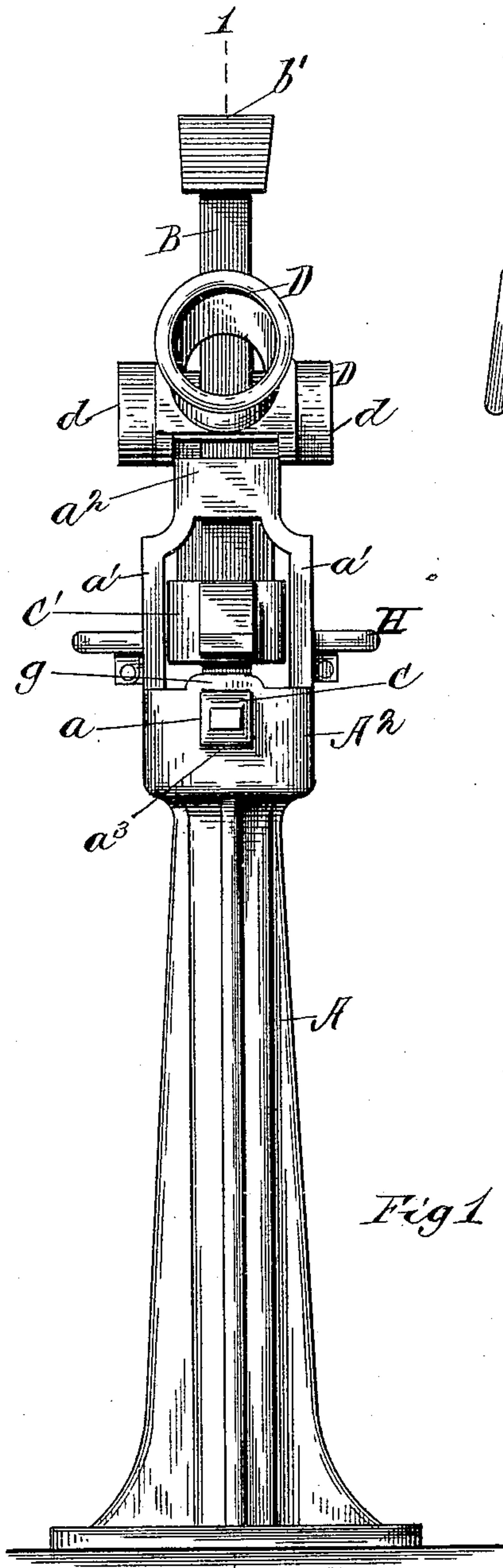


Fig 1

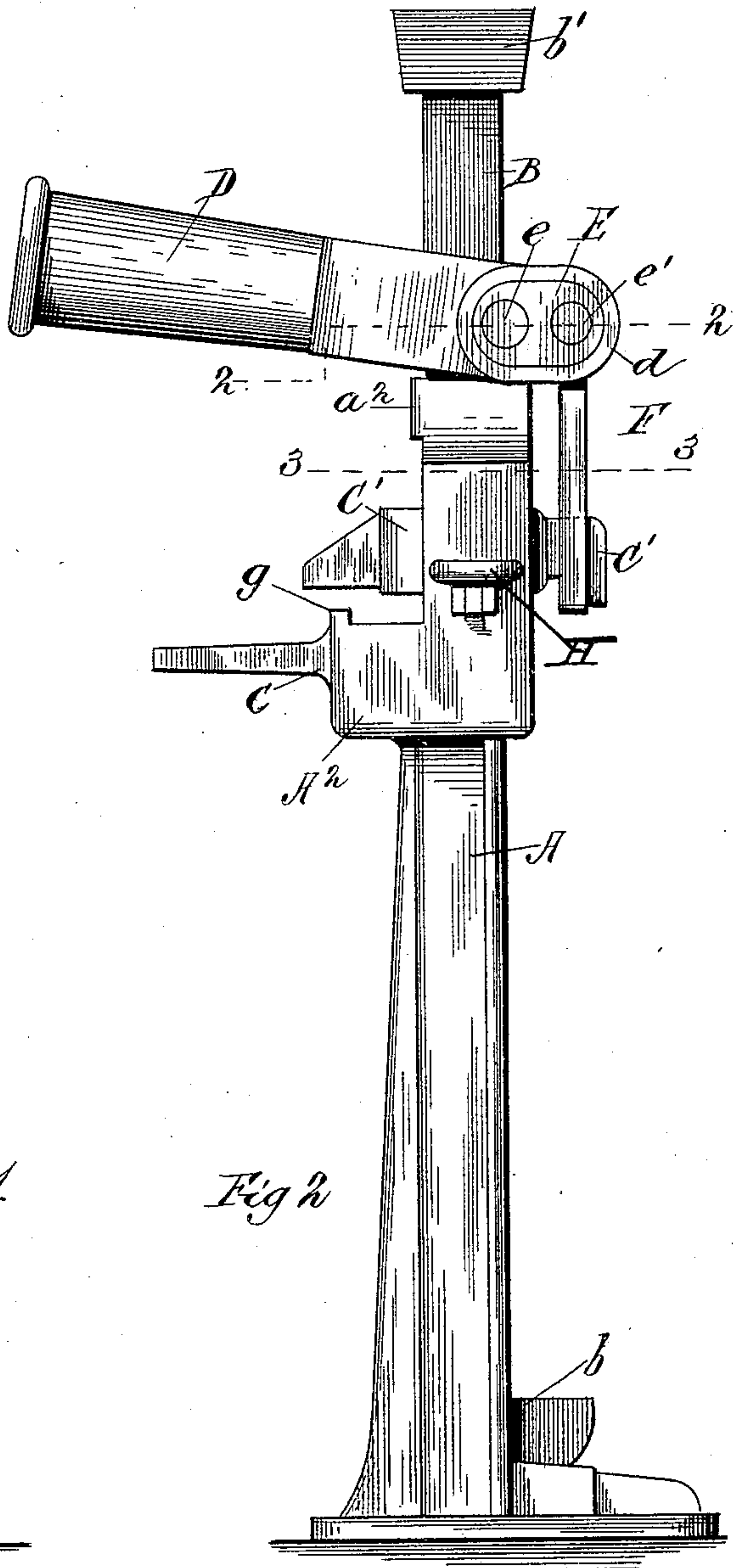


Fig 2

Witnesses
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John T. Donahoe

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Arthur L. Stanford
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(No Model.)

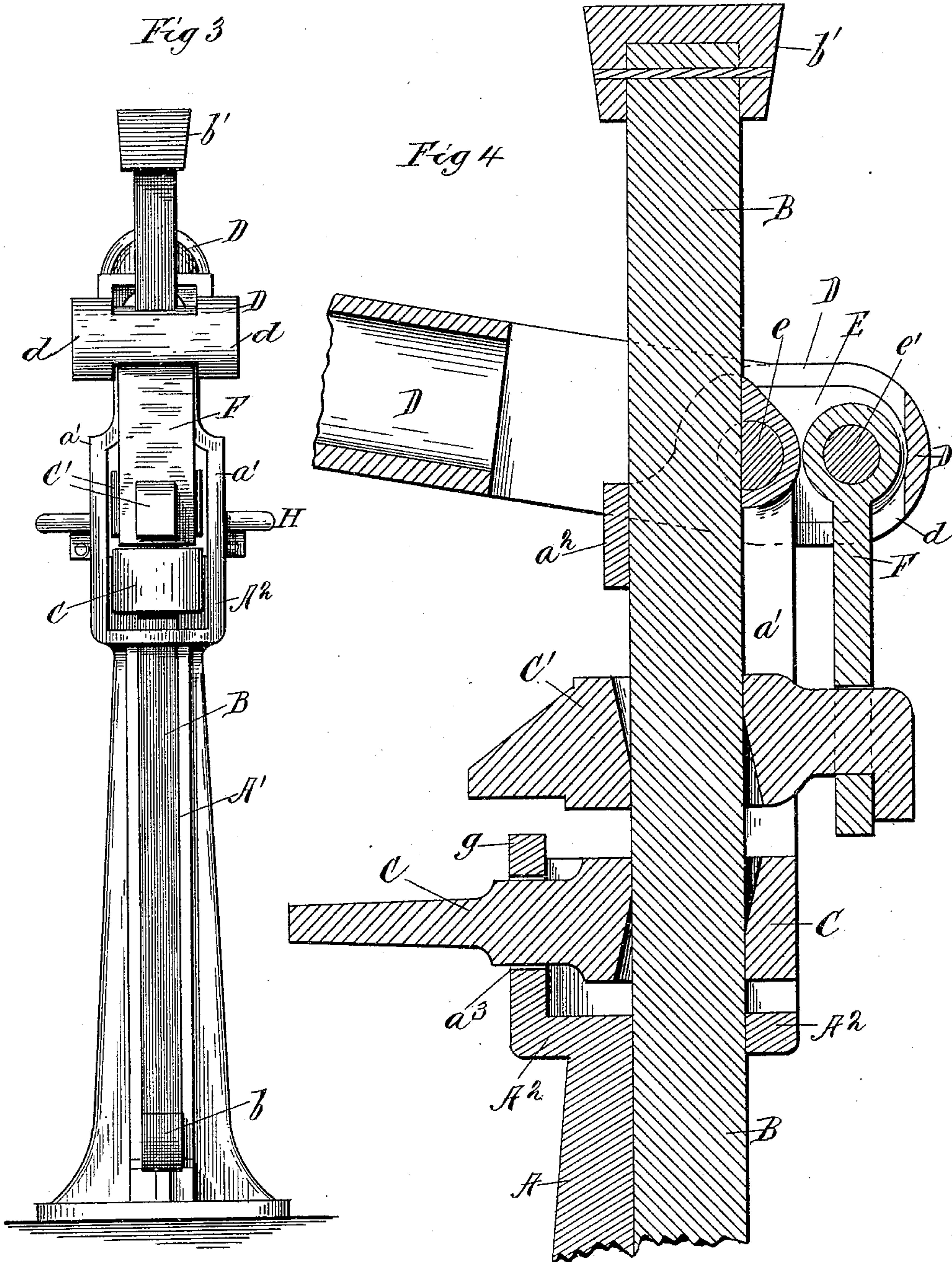
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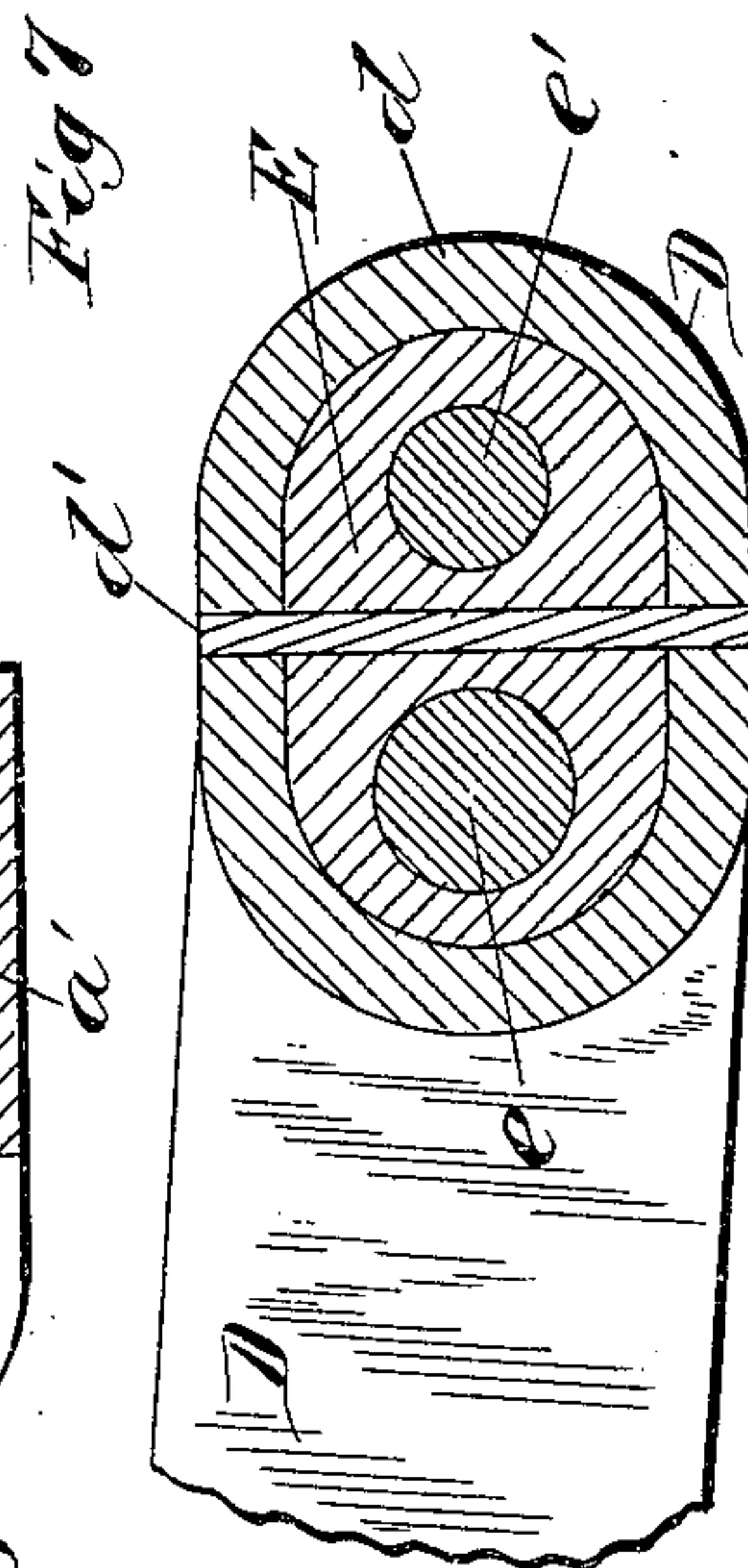
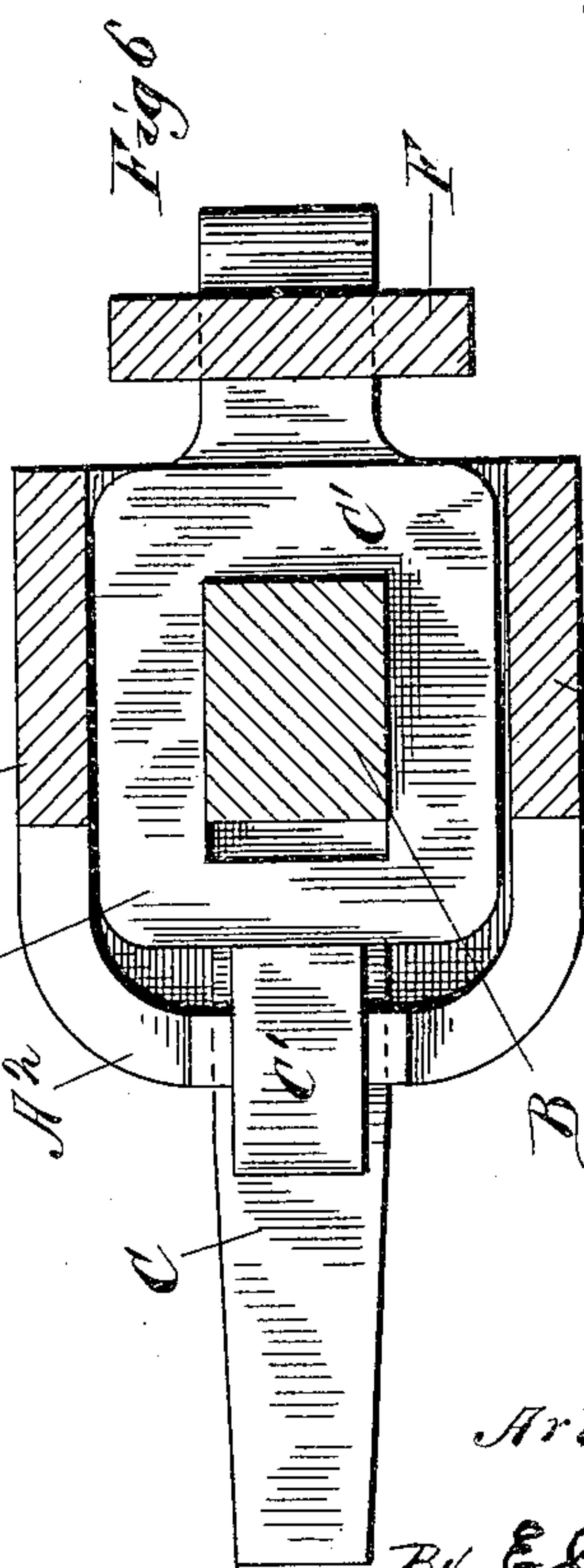
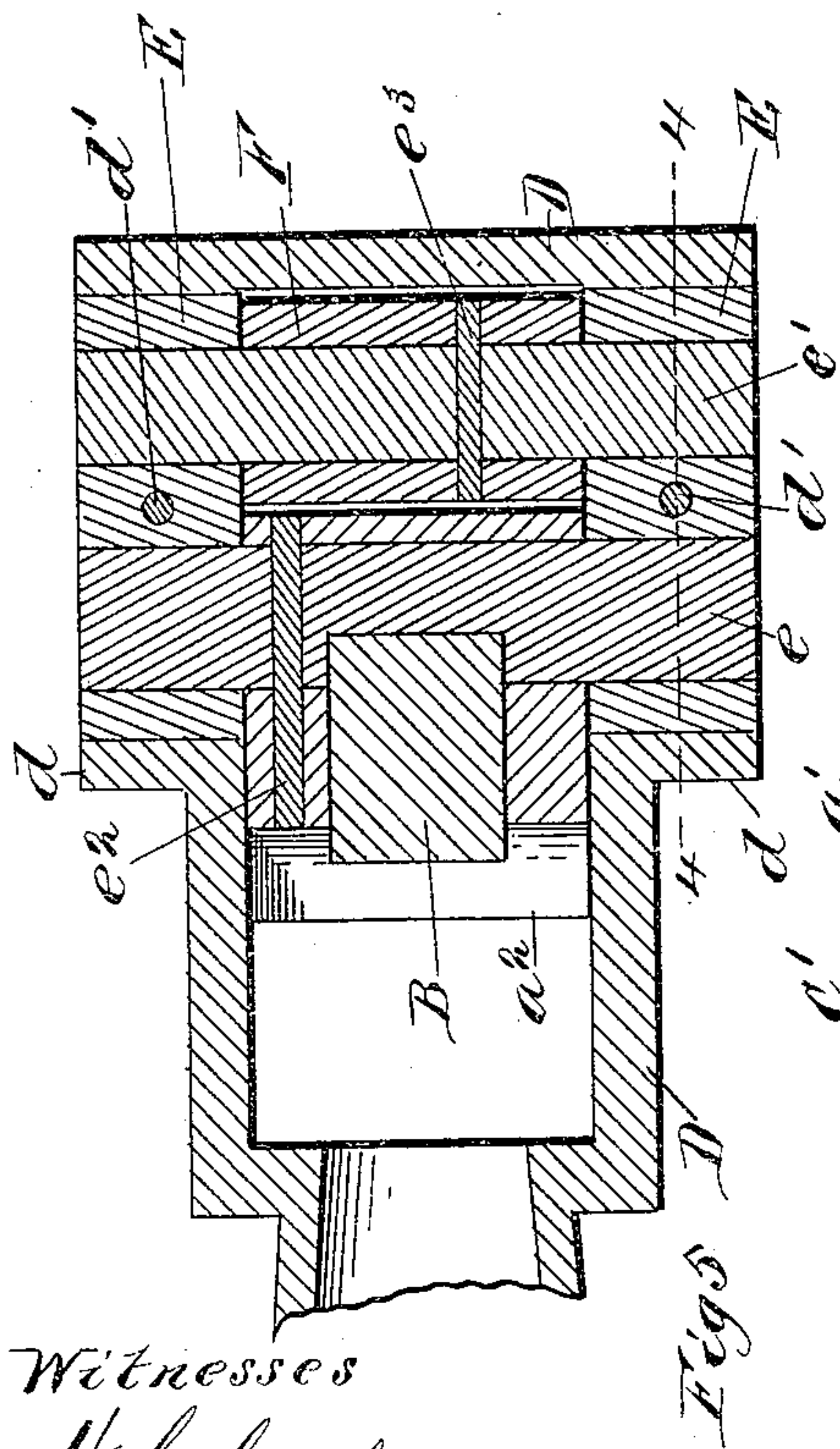
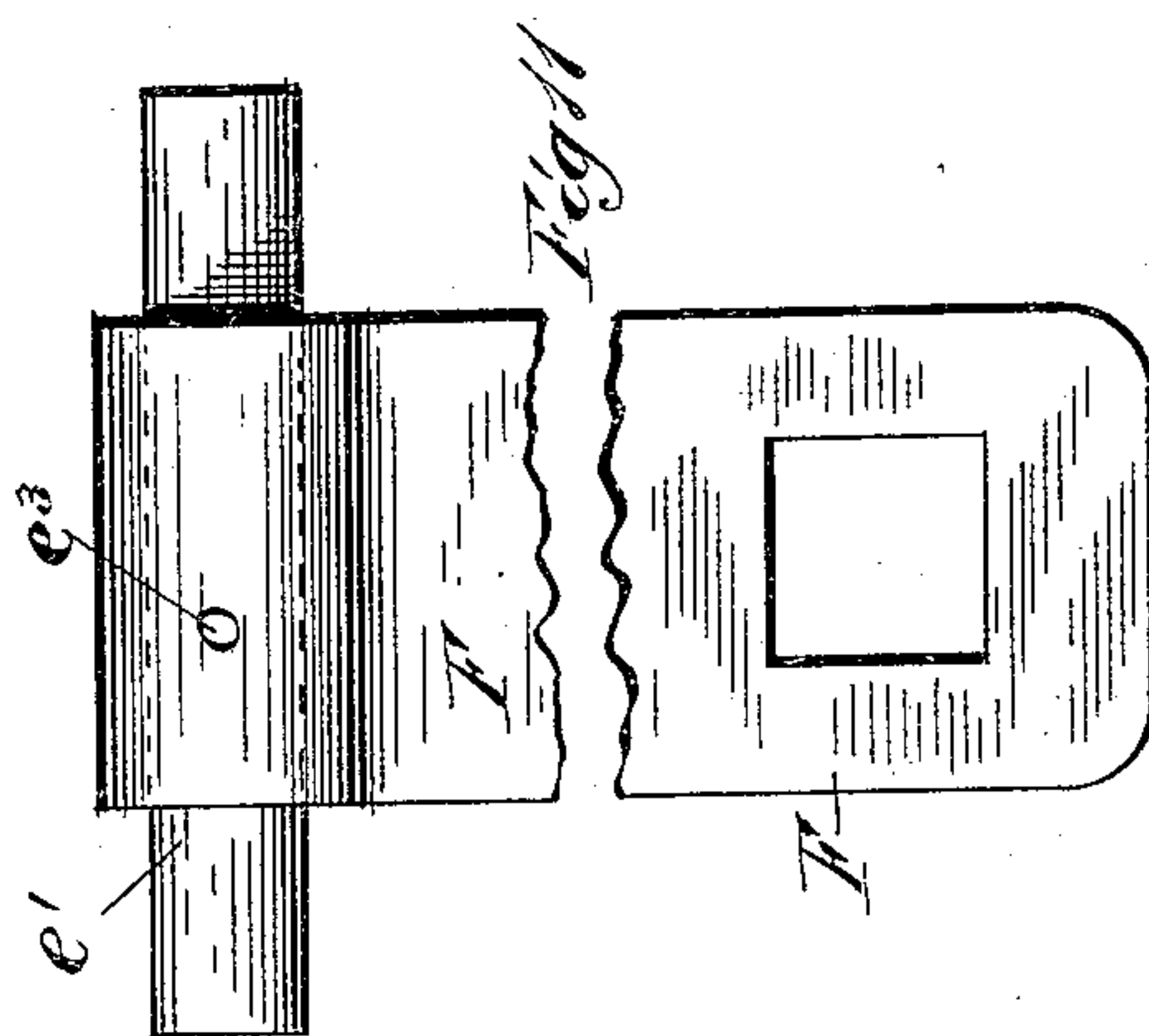
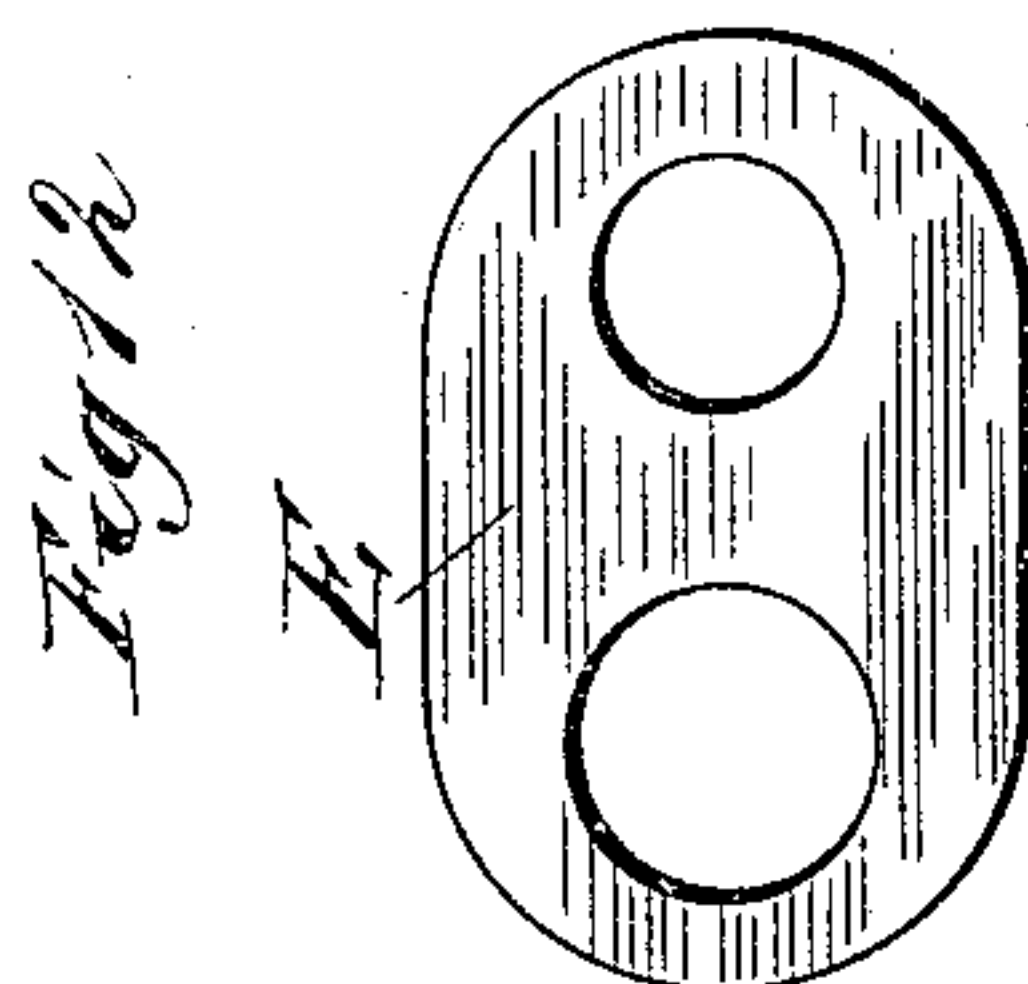
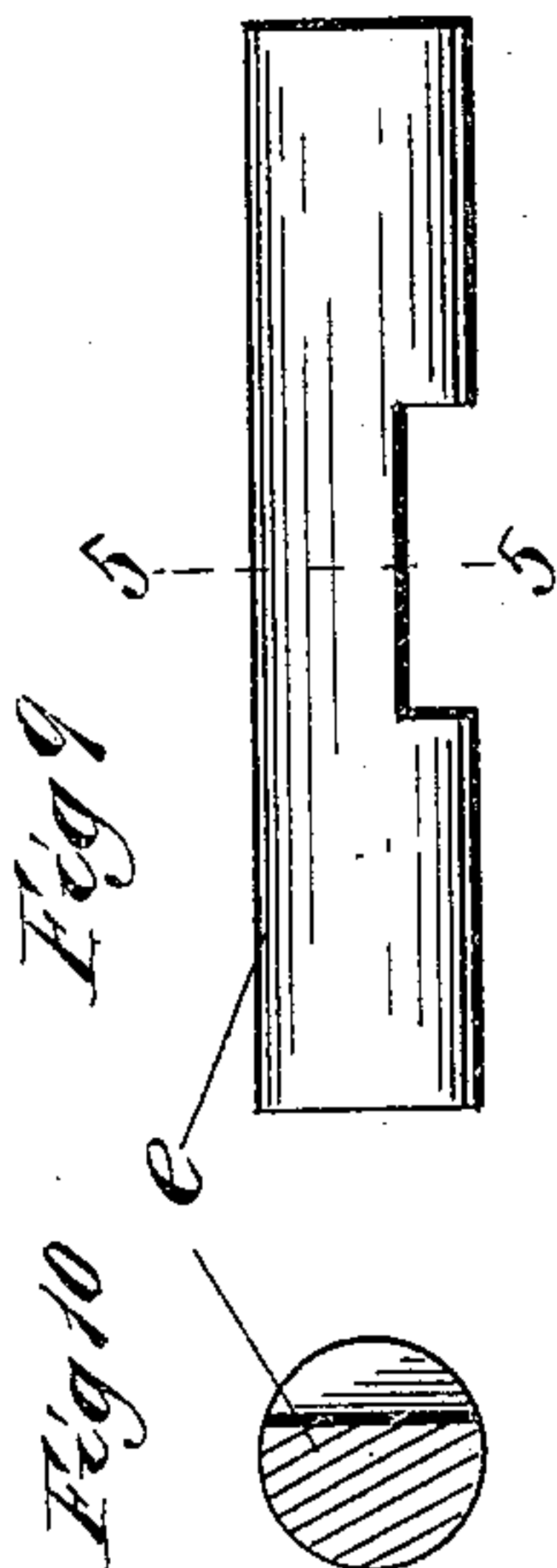
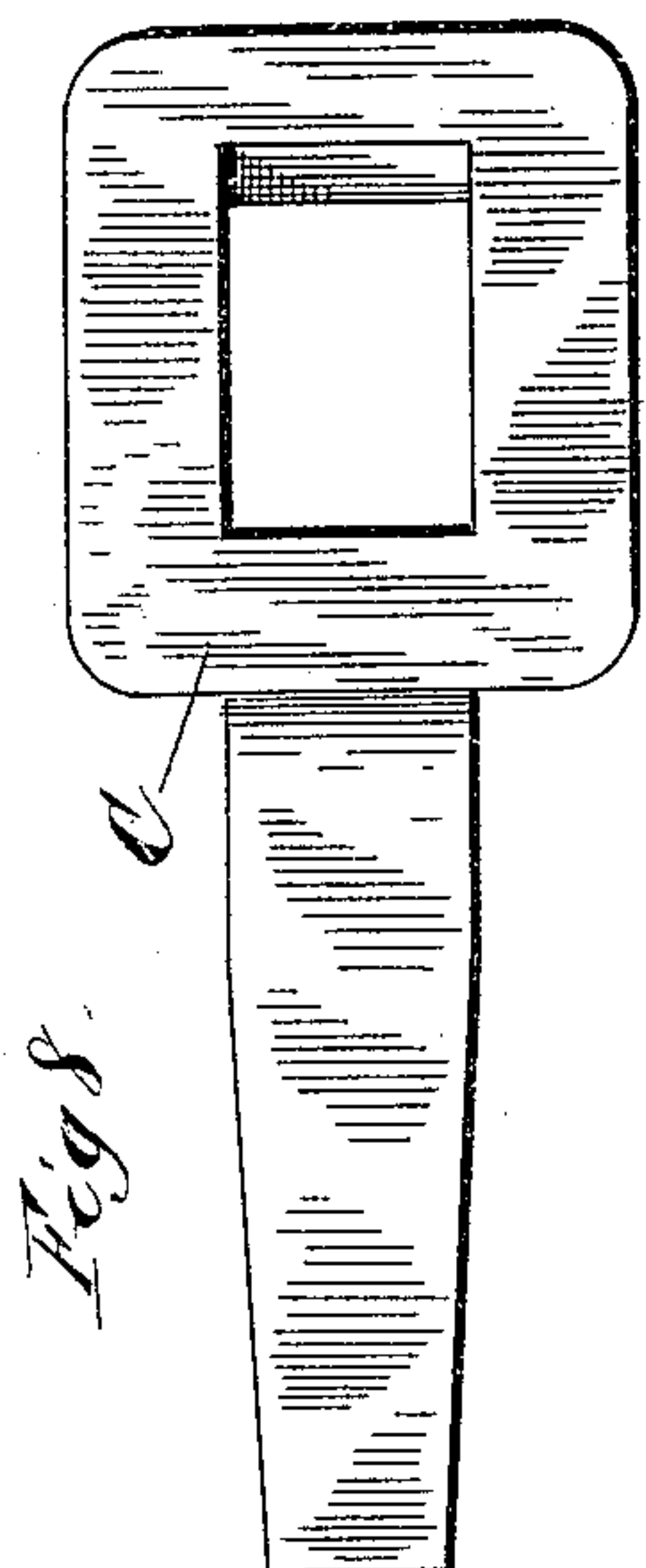
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UNITED STATES PATENT OFFICE.

ARTHUR L. STANFORD, OF WAUKEGAN, ILLINOIS.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 389,861, dated September 18, 1888.

Application filed March 15, 1888. Serial No. 267,271. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR L. STANFORD, a citizen of the United States, residing at Waukegan, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

My invention is embodied in and effectuated by the mechanism hereinafter described, reference being had to the accompanying drawings and the letters of reference marked thereon.

Of the lifting-jacks now in existence, those of simple construction have been found imperfect in operation, and the more effective ones are so complicated in construction that their manufacture is too expensive, and their tendency to get out of order is greatly increased by the large number of their constituent parts.

My invention is designed to overcome these difficulties by furnishing a lifting-jack both simple in construction and perfectly effective in operation. I will now describe the mechanism whereby I accomplish such design.

In the accompanying drawings, Figure 1 is a front elevation of a lifting-jack embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a rear elevation of the same. Fig. 4 is an enlarged vertical longitudinal section of the upper part of the jack, taken on the line 1 1 in Fig. 1. Fig. 5 is a detail plan section of the same, taken on the line 2 2 in Fig. 2. Fig. 6 is a plan section taken on the line 3 3 in Fig. 2. Fig. 7 is a detail section of a portion of the lever, taken on the line 4 4 in Fig. 5. Fig. 8 is a plan view of the retaining friction-pawl detached. Fig. 9 is a plan view of the pivot-pin of the lever detached. Fig. 10 is a cross-section of the same, taken on the line 5 5 in Fig. 9. Fig. 11 is a front elevation of the lifting-link and its pin detached, and Fig. 12 is a side elevation of one of the bushings.

Similar letters refer to similar parts throughout the several views.

A is the standard of my lifting-jack, preferably made of malleable iron, having a base broad enough to stand upon securely.

A' is a recess in the standard, extending through its entire length, being continued in slots made through the base, the lower part

of the projection A², and the head a² of the standard. B is the lifting-bar, which moves in said recess and slots. The projection A² is an enlargement of the standard, hollow and open at the rear and at the upper part of the front side, and it has a stop, g, on its upper front surface and a slot through its base, as indicated above. In the front side there is an aperture, a, designed to receive the end of the lever of the retaining friction-pawl C, and to furnish a bearing for it at a³. C' is the lifting friction-pawl. These pawls are constructed as follows: Each one has an opening through it transverse to its longer axis, the minimum diameter of which is slightly greater than that of the lifting-bar. The opening in the lifting-pawl is slightly beveled, so as to produce plane faces somewhat less than one-half the length of said opening on its front and rear sides, such plane face on the former side being next to the lower side of the pawl, and that on the latter being next to the upper side, when said pawl is in its place in the standard ready to grip and lift the bar B. The retaining-pawl has like bevels, made, respectively, so as to alternate with those above described when it is in position in the projection of the standard ready to grip the bar B in its downward motion. The above change in the surface of the openings of the pawls is the one made when the openings extend through the pawls in an oblique direction. They may extend through the pawls in a line at right angles to their longer axes. In such case sides opposite to those indicated above will be beveled, or they may be recessed instead of beveled, or wedges may be inserted in said openings, so as to produce the same effect as the above construction produces.

The walls of the projection A² are in part produced in the branches a', which unite and form the head a² of said standard. Through this head a slot is made for the passage of the bar B, as shown above. The parts A², a', and a² are all cast integrally with the standard. b is the foot of the lifting-bar, designed to be passed under the load to be lifted.

b' is a head on the lifting-bar, designed to keep the bar from dropping out of the standard when both pawls are disengaged at once.

It is also a bearing on the bar for use when the top of the bar instead of the foot is placed under the load. The head is made so as to be removed to allow the bar to be slipped through the slot in the base, the recess of the standard, &c., when the mechanism is being put together for use.

D is the lever, designed to actuate the lifting-pawl C' and with it the bar B. This lever is bifurcated near its rear end to permit the bar B to pass through it, and so that its branches will snugly embrace the head a^2 . Its branches are preferably connected at their rear end by a cross-piece cast integrally with them, and near their front end the branches have each a boss, d . In these bosses slots are made horizontally. Fitting in these slots are hard-metal bushings E, which are secured by the pins d' passing through said bosses. These bushings are pierced with holes furnishing bearings for the journals of a hard-metal pin, e , which passes through the head a^2 , being made rigid with it by a pin, e^2 , and thus serves as a fulcrum for the lever D. The bushings also provide bearings for a hard-metal pin, e' , next to the end of the lever which sustains the link F, being made rigid with it by suitable means, as pin e^3 .

The pawl C' is placed between the branches a' , so that its rear face, designed for contact with the bar, will be above and its corresponding front plane face below. The pawl C is placed in the hollow of the projection A^2 , with its faces designed for contact with the bar opposite to those of the pawl C' and with its lever on the bearing a^3 . The open part of the link F is passed over the hooked end of the pawl C'. The bar B is passed up through the slots and recess prepared for it. Thus the mechanism is ready for use.

Its operation is obvious. Lifting the long arm of the lever D, the pawl C' is lowered. Reversing this movement, the link F cants the pawl and the surfaces of its opening above described are brought in contact with the bar B. Friction holds the bar fast, and it is lifted as the long arm of the lever is depressed. Now lifting the long arm of the lever D, the bar during its upward movement being brought lightly in contact with the above-described faces in the opening of the pawl C, the first downward motion of the bar will increase the friction between it and said faces, so that the pawl C will be canted and will consequently at once bind the bar and prevent it from descending. To permit the bar to descend, bear down on the lever D enough to support the load and then depress the long arm of the lever of the pawl C.

The greatest efficiency in operating my lifting-jack, together with the least tendency toward breaking, has been found by experiment to be attained by making the distance about one inch and three-quarters between the lifting-bar and the points of support of the

respective pawls on the link and on the face of the aperture a . I likewise so construct my jack that a line drawn through the centers of the journals of the pins e and e' will not be parallel with the longitudinal axis of the lever D. Thus ease in operating is secured, since it is not necessary for the lever D to descend as far as would otherwise be necessary in accomplishing a given quantity of work.

The lifting-bar is preferably rectangular and thicker in one direction than another. Its greatest thickness must be a little less than the minimum diameter of the openings of the pawls. It is passed through the pawls with its narrower sides next to the sides of the openings designed for contact with it. Thus its tendency to bend is diminished. The standard is provided with handles H H, by which it may be carried.

I am aware that previous to my invention herein described lifting-jacks have been devised embodying the combination of a friction-pawl operated by a lever and sliding upon a lifting-bar, and also a stationary pawl arranged to hold such bar up by friction. I therefore do not claim such combination broadly.

I am also aware that lifting devices have been heretofore made with circular openings which permit the turning of the bar and with curved acting-faces; also with angular openings with comparatively sharp biting-edges. With my improvement the bar cannot turn, and by making the clamping or contact part nearly or quite one-third of the thickness of the pawl I obtain a frictional contact which gives a stronger hold with less wear on the parts in use.

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. In a lifting-jack, the combination, with the lifting-bar B and its pawls C C', of the standard A, provided with a vertical longitudinal recess, A' , hollowed and slotted projection A^2 , and vertically-slotted head a^2 , said hollowed projection being provided with an aperture for the lever of the retaining-pawl C, and a stop for releasing the lifting-pawl C', a guide for the lifting-bar being afforded in the recess A' and head a^2 , which head also furnishes a support for the fulcrum-pin e of the lever for actuating the lifting-pawl, substantially as described.

2. In a lifting-jack, the combination, with the standard A, having head a^2 , of the lever D, bifurcated near its lifting end and provided with slotted bosses dd on the sides of said end, bushings E, placed in said slots, and the fulcrum-pin e and lifting-pin e' , engaged in said bushings, substantially as described.

3. In a lifting-jack, the combination, with the standard A, lifting-bar B, pawl C', and lever D, of the link F, having a lifting-pin, e' , rigidly secured therein and connected with the lifting end of the lever, substantially as described.

4. In a lifting-jack, the combination of the standard A, having head a^2 , the fulcrum-pin e , rigidly secured in said head, the lever D, having a bifurcated and slotted lifting end,
5 the link F, having a lifting-pin, e , rigidly secured therein, the bushings E, located in the slotted lever and receiving said pins e and e' , in such proximity as to afford a long leverage, the lifting-pawl C', and lifting-bar B, substantially as described.

ARTHUR L. STANFORD.

Witnesses:

W. C. CORLIES,

E. C. CRAWFORD.