

No. 788,340.

PATENTED APR. 25, 1905.

G. B. TAYLOR.
PARALLEL BENCH VISE.
APPLICATION FILED AUG. 15, 1904.

3 SHEETS—SHEET 1.

Fig. 1.

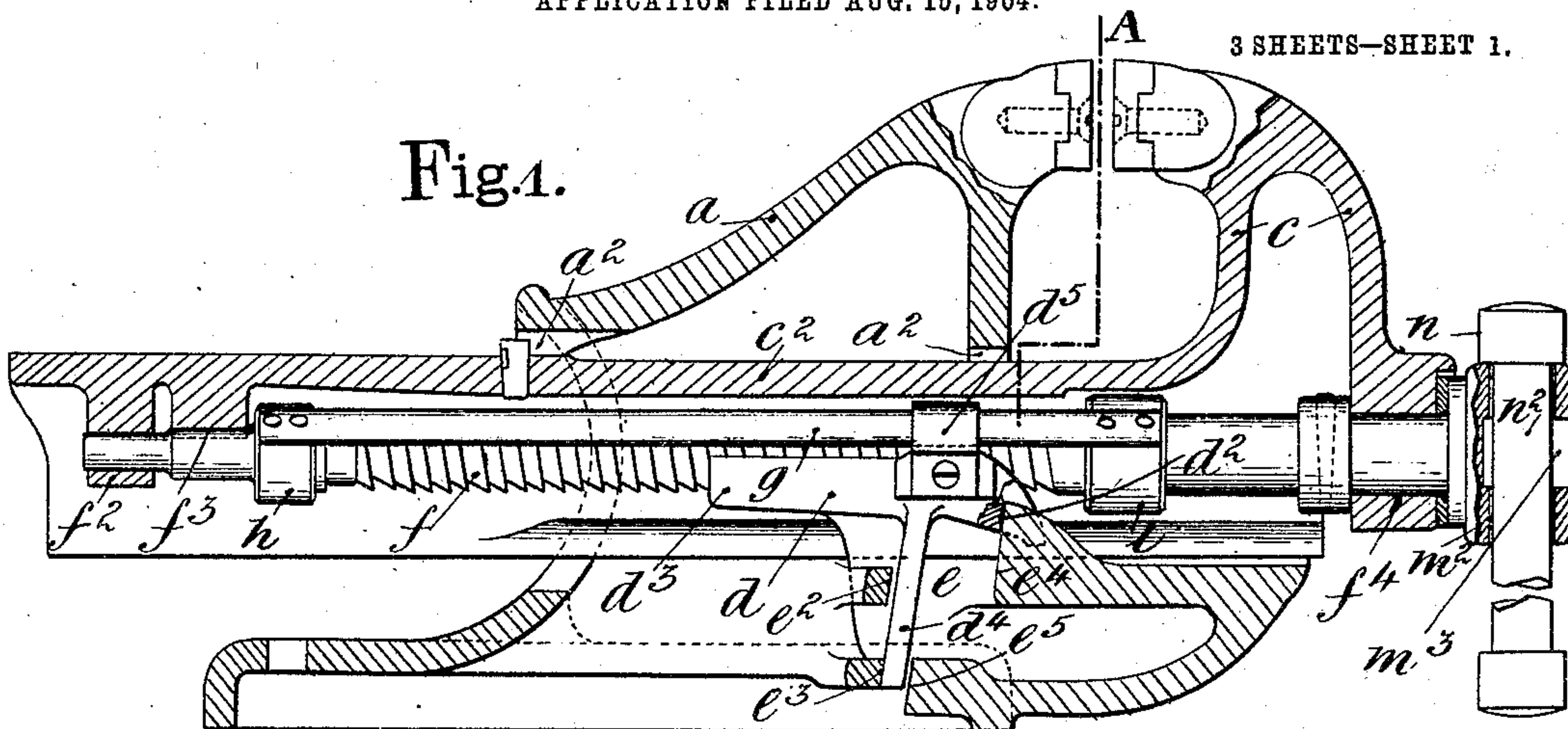


Fig. 3.

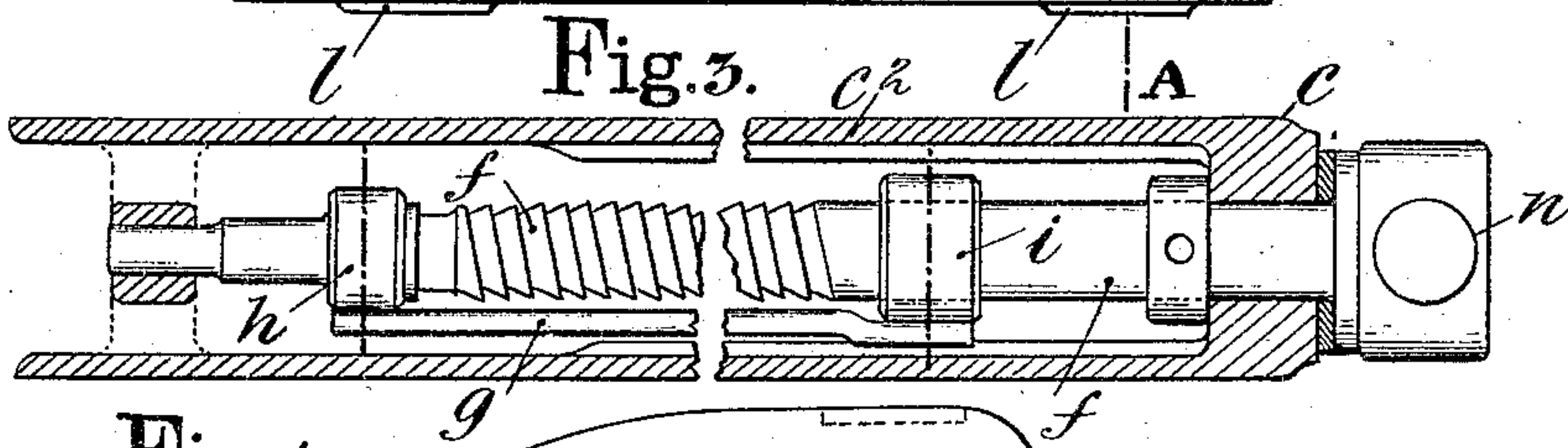


Fig. 4.

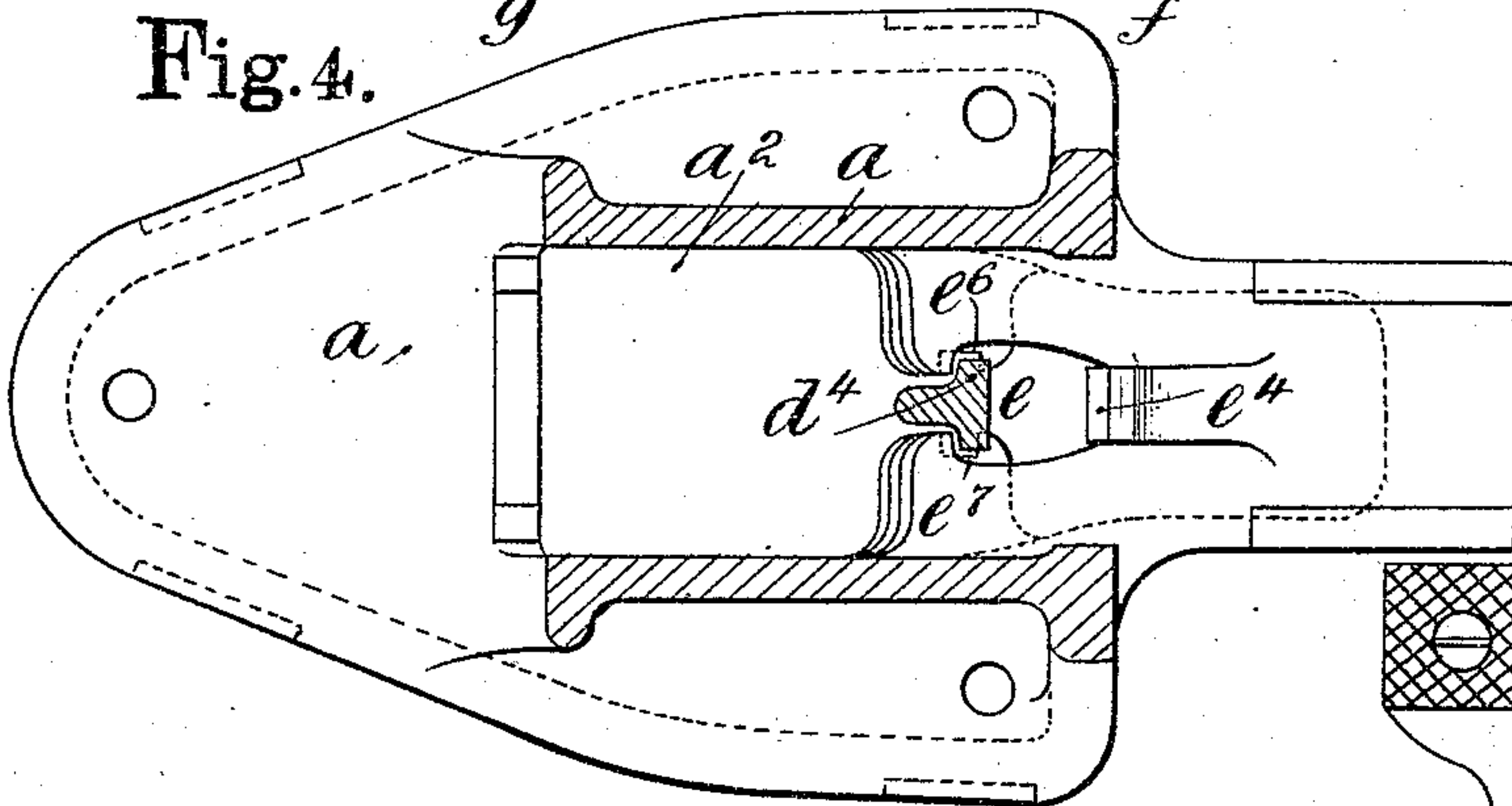


Fig. 2.

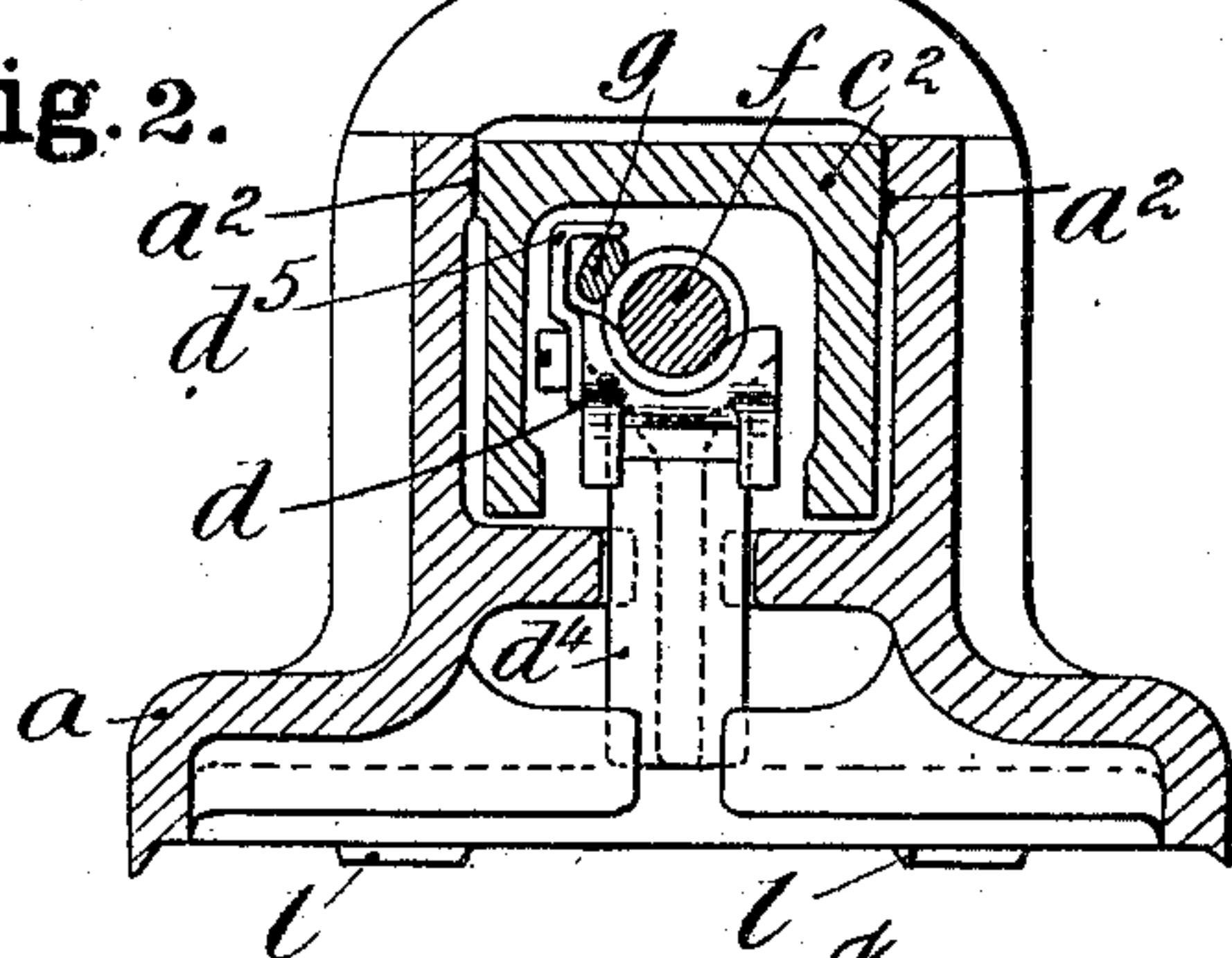


Fig. 6.

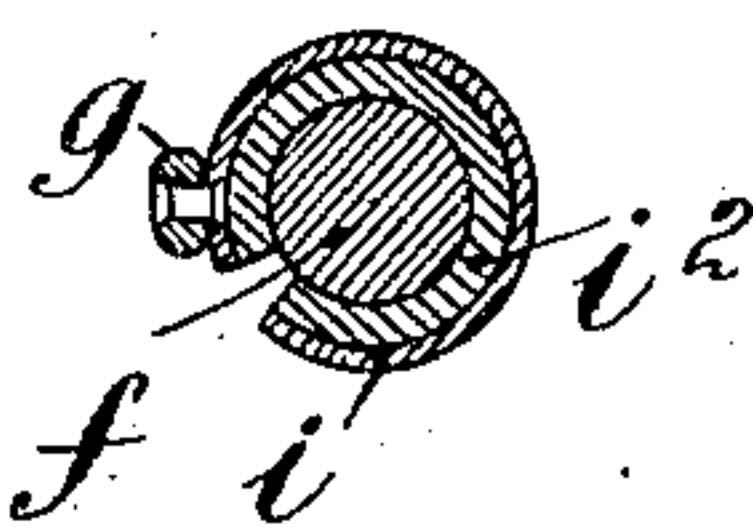


Fig. 5.



Witnesses

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3 SHEETS—SHEET 2.

Fig. 7.

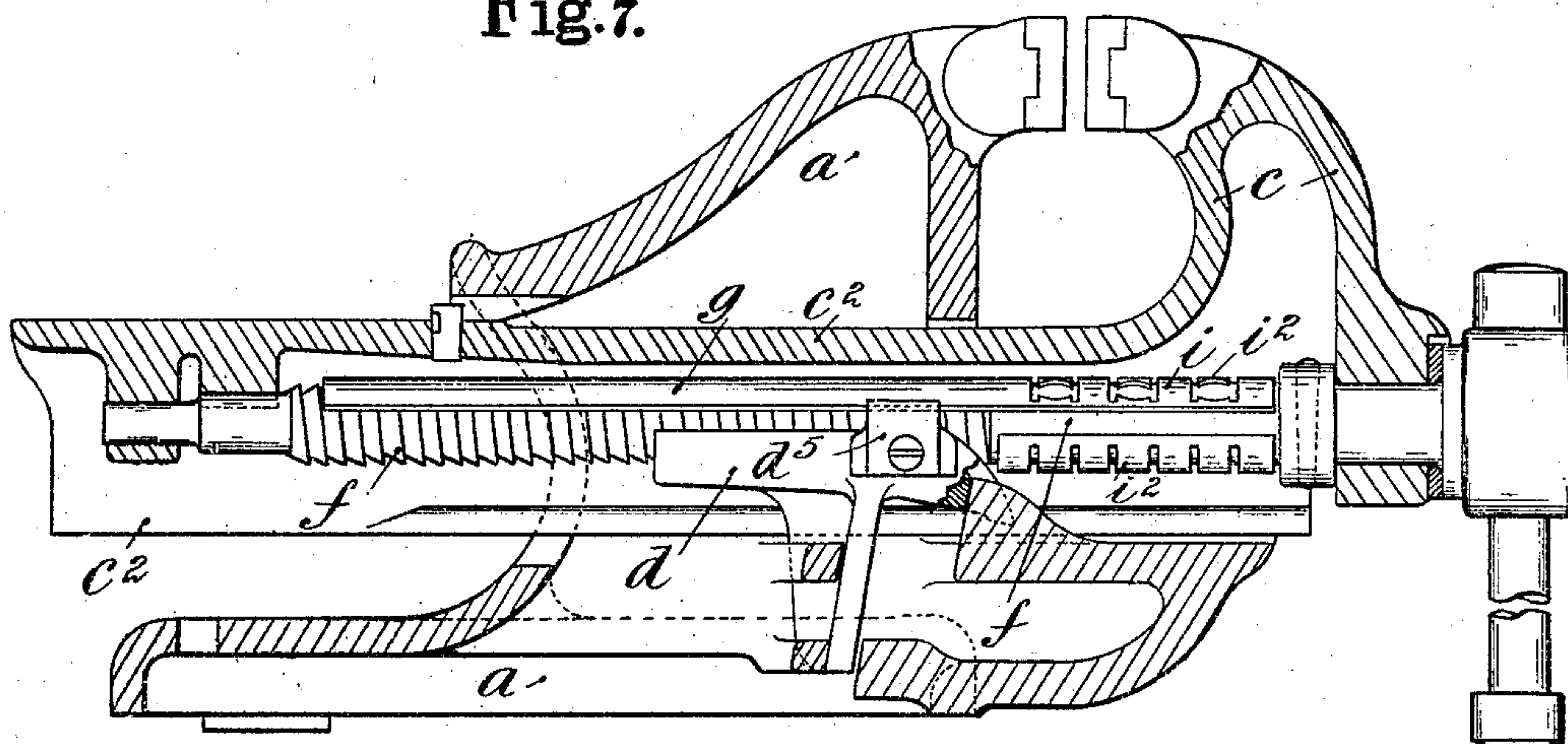
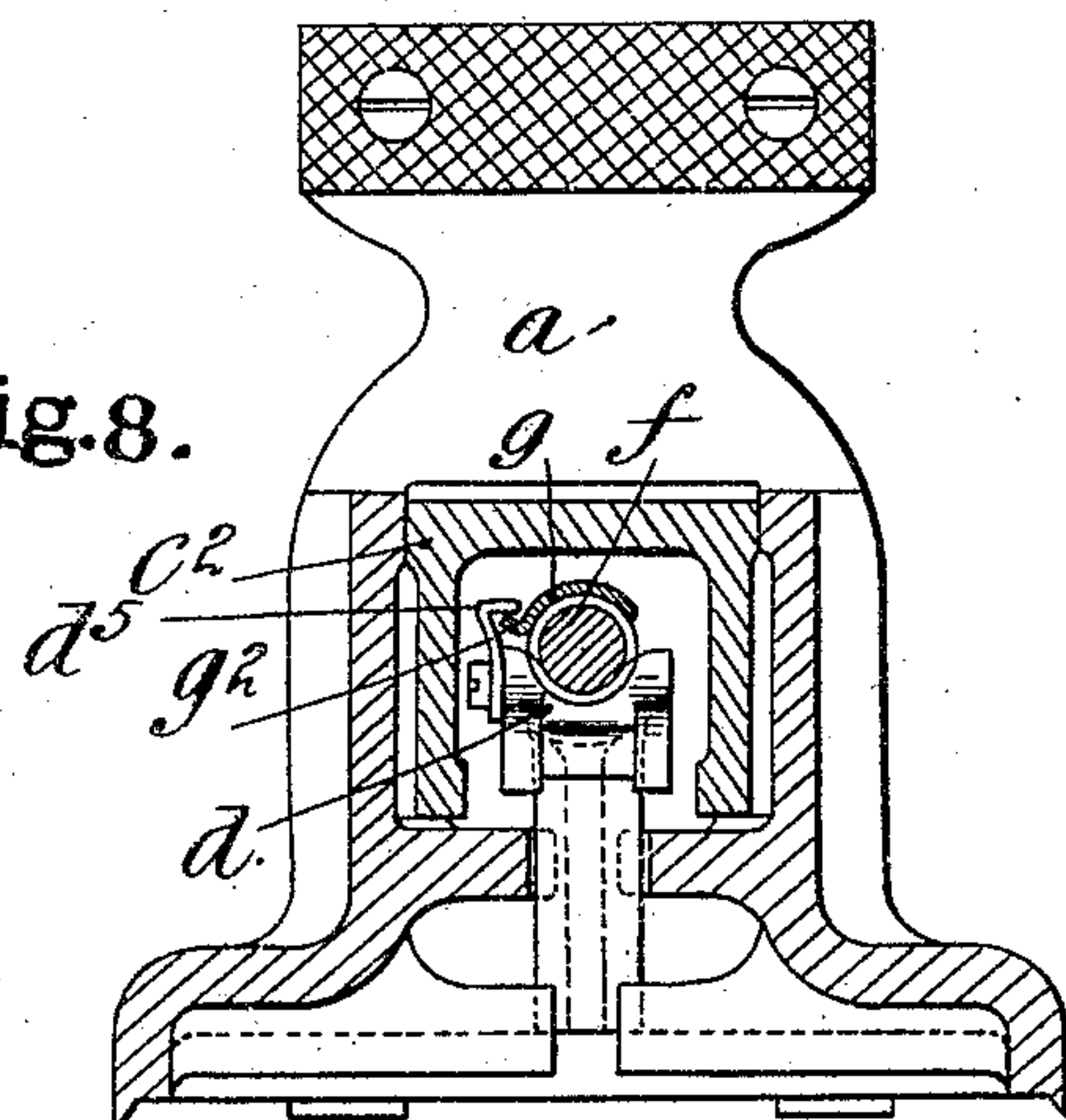


Fig. 8.



Witnesses.

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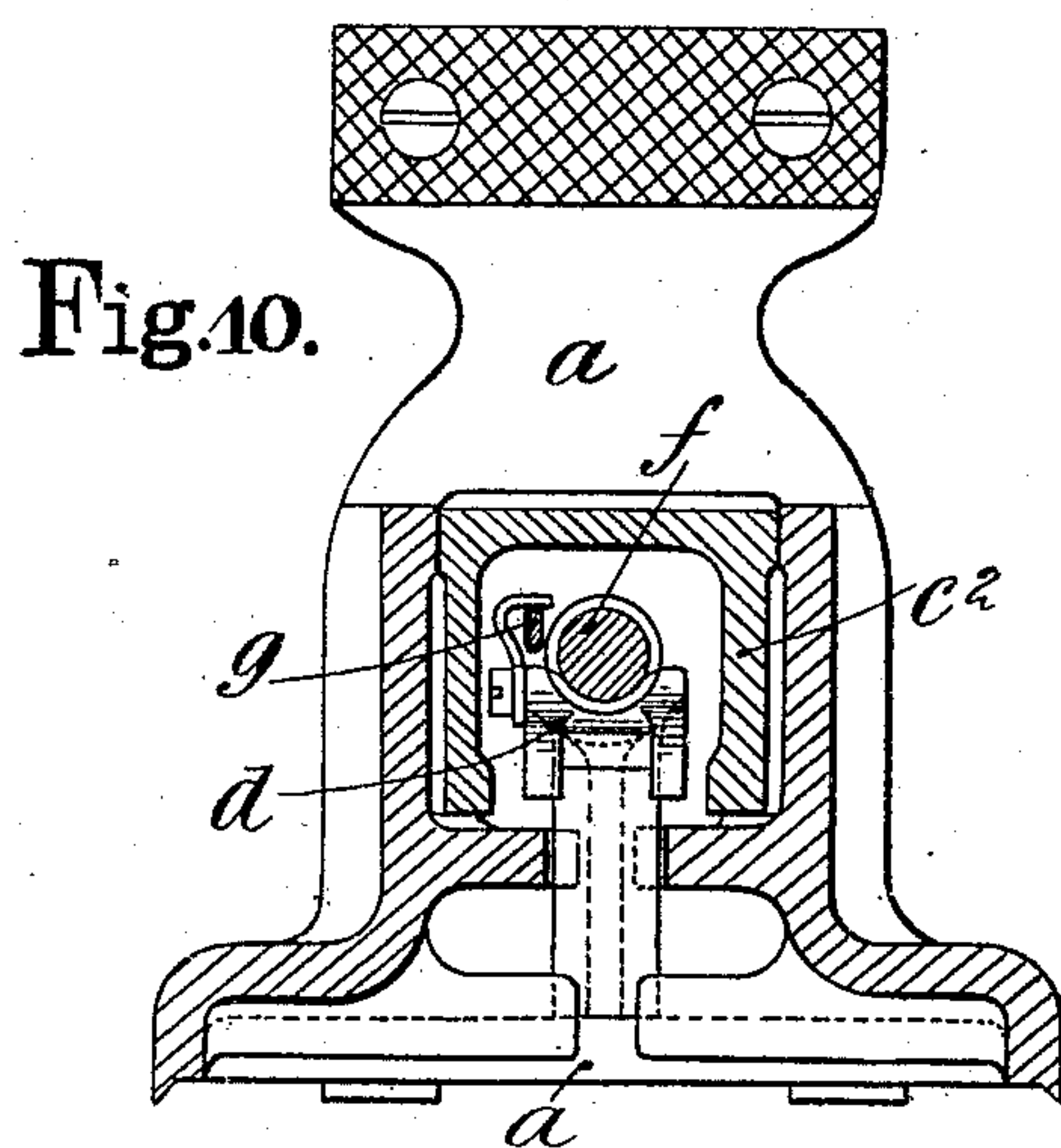
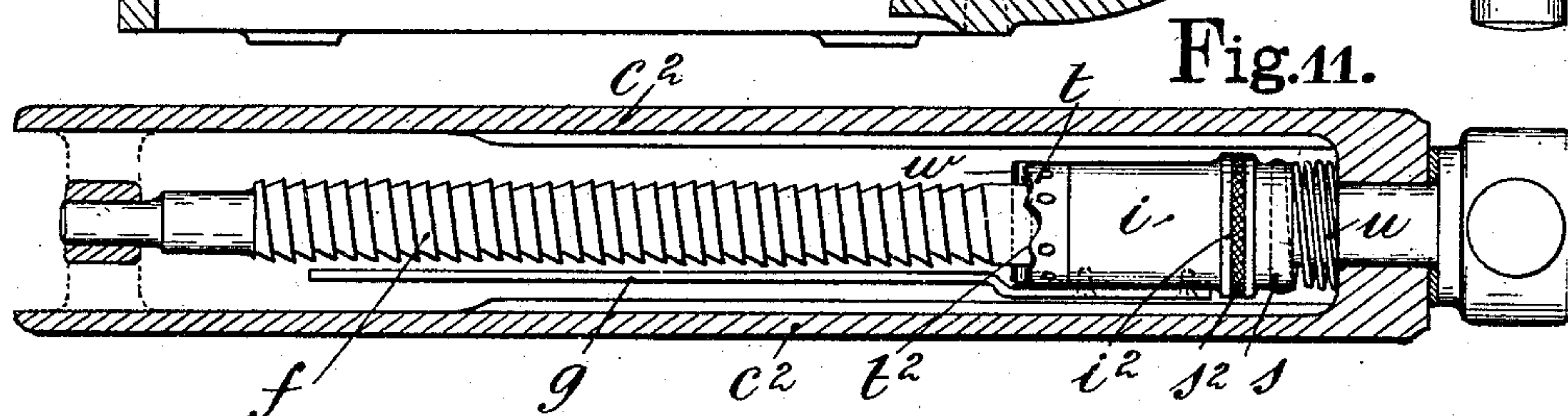
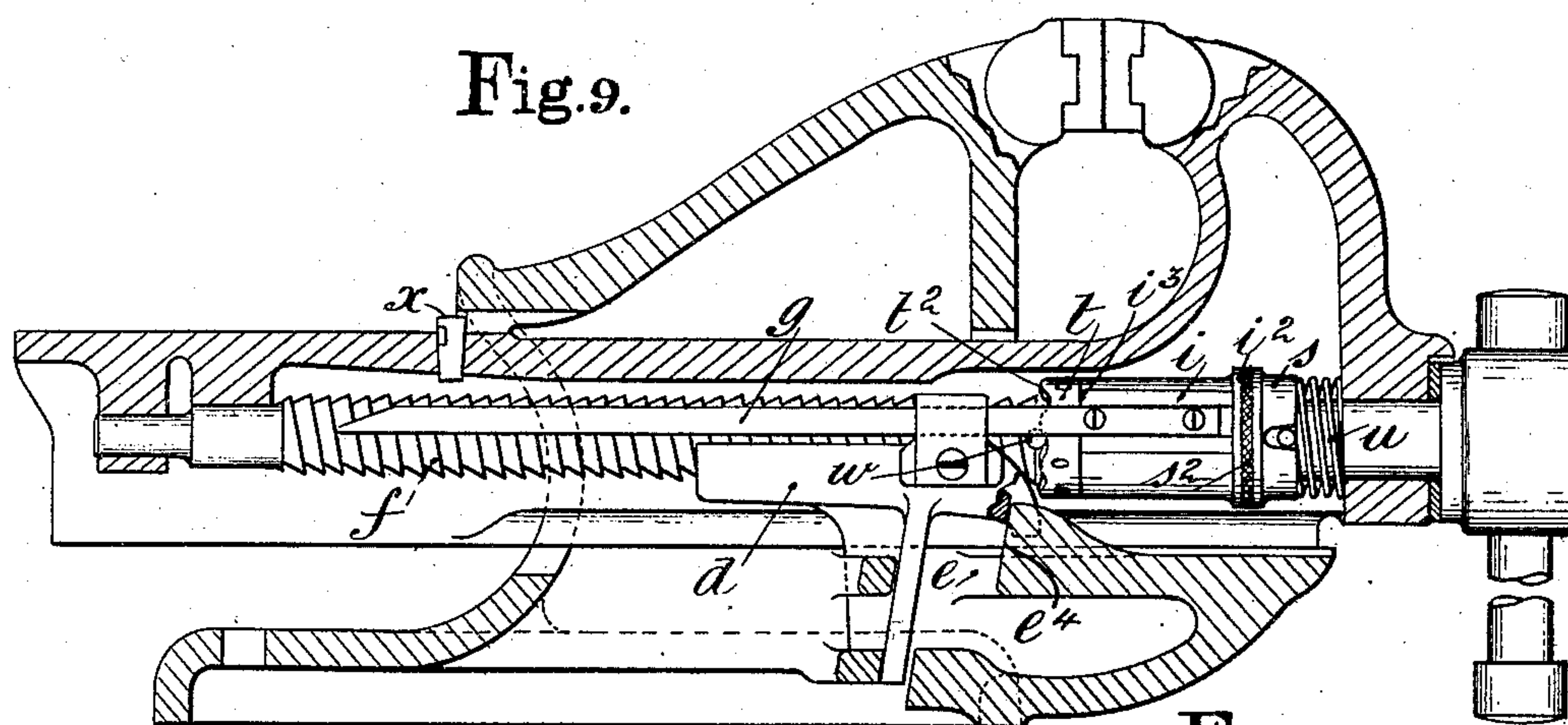
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3 SHEETS—SHEET 3.



Witnesses.

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Inventors.

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UNITED STATES PATENT OFFICE.

GEORGE BENJAMIN TAYLOR, OF BIRMINGHAM, ENGLAND.

PARALLEL BENCH-VISE.

SPECIFICATION forming part of Letters Patent No. 788,340, dated April 25, 1905.

Application filed August 15, 1904. Serial No. 220,833.

To all whom it may concern:

Be it known that I, GEORGE BENJAMIN TAYLOR, engineer, a subject of the King of Great Britain, residing at 43 Bartholomew street, Birmingham, in the county of Warwick, England, have invented certain new and useful Improvements in Parallel Bench-Vises, of which the following is a specification.

My invention relates to a parallel bench-vise in which the movable jaw (worked by a screw and screw-box to grip and release) is fitted to the fixed jaw so as to be free to be pushed in and pulled out by hand to obtain a rough adjustment of the jaws, and comprises the hereinafter-described improvements therein.

In a vise as aforesaid my invention provides a simple and effective frictionally-operated coupling means between the rotatable screw and the screw-box, whereby the said screw and screw-box can be made to engage and disengage by a slight turning movement of the screw. The coupling means comprises a number of clips or clamps surrounding the screw or parts of it, so as to frictionally grip it, and a connecting-link or the like between the said clips or clamps and the screw-box. The latter is adapted to move in a "way" with inclined sides pitched so as to assist the engagement of the screw or screw-box, the thrust end of the said way holding the screw-box below the outside line of screw engagement, and thereby effecting the whole engagement of the screw-box with the screw, particularly at the end farthest away from the thrust end aforesaid. The frictionally-operated coupling means is capable of being carried out in various ways.

My invention also includes detail features for the securing of such a vise to a bench and in the fitting of the handle by which the screw is turned to the head of the screw.

The improvements indicated in substance by the foregoing will by the accompanying sheets of drawings and the description hereinafter appearing be made quite clear in several forms differing only in detail construction, the first form being represented on Sheet 1 by the longitudinal section, Figure 1, the transverse section, Fig. 2, and the horizontal sections, Figs. 3 and 4, and transverse sections

Figs. 5 and 6. The section Fig. 2 is taken on the dotted lines A A, Fig. 1. Fig. 4 is a plan of the fixed jaw of the vise only, the upper portion of the said jaw being cut away. Fig. 3 is a section of the movable jaw only, the upper portion of the said jaw being cut away. Figs. 5 and 6 are detail sections through the screw and clips or clamps only.

With reference to Figs. 1 to 6, a is the fixed jaw, and c is the movable jaw, the shank c^2 of the latter being made to slide in the ordinary way in a "guiding-way" a^2 of the fixed jaw. f is the rotatable screw for traversing the movable jaw in the fixed jaw, this screw having its bearings in the said movable jaw at f^2, f^3 , and f^4 . d is a screw-box fitted within the interior of the body part of the fixed jaw a to slide or move up and down in a guiding-way e , the sides of this way e being represented by the surfaces e^2, e^3, e^4 , and e^5 , which are inclined or pitched upwardly toward the handle end of the vise, this inclining or pitching assisting the full and complete engagement of the screw-box with the screw. This screw-box d is adapted to engage and disengage the screw f . The surface e^4 is a thrust-surface against which the forward end d^2 of the screw-box bears when the movable jaw is screwed up to close the jaws, this thrust-surface and forward end being so arranged that contact between them is below the lowest line of engagement of the screw-box with the screw, which has the effect when the movable jaw is screwed up of causing a sure and whole engagement of the rear end d^3 of the said screw-box with the screw and also of preventing the said end d^3 sagging out of engagement with the screw. A cross-web d^4 of the screw-box d is the part which is guided by the surfaces e^2, e^3, e^4 , this web being laterally guided by ends e^6, e^7 of the way e . (Represented in Figs. 2 and 4.) The sliding screw-box d hangs within the way e from a rod g , which forms a link between the said screw-box and two spring clips or clamps h and i , surrounding parts of screw f , so as to frictionally grip these said parts. The said clips, which are lined with leather or other suitable material h^2, i^2 and to which the rod g is rigidly connected by riveting or other convenient means,

are clearly represented in cross-section by Figs. 5 and 6, the one being provided on the screw near the handle end and the other near the opposite end to the handle, the rod *g* coupling them. The clips embrace the parts of the screw with sufficient tightness to, when the screw is rotated, lift the screw-box *d* in its way into engagement with the screw, and the screw only turns without imparting movement to the clips when the screw-box is stopped from being further lifted in its way, the friction between the clips and the parts of the screw being at this time overcome. The screw-box *d* hangs onto the rod *g* by a hook-like piece *d*⁵. The clips *h* and *i* may be made so that the amount of tightness with which they grip the parts of the screw they surround can be adjusted. From the foregoing it will be clear that if the screw *f* is turned in a direction to close the jaws *a* and *c* the screw-box *d* is by the first turning movement of the screw lifted into engagement with the screw *f*, both clips *h* and *i* turning together with the screw, and, further, that after the said screw-box has engaged the screw the latter can continue to turn without carrying the clips with it. In like manner if the screw *f* is turned in the reverse direction the clips *h* and *i* move with it to disengage the screw-box from the screw or to allow the rod *g* to move so that the screw-box by its own weight can fall out of engagement with the screw. Upon the under side of the base of the fixed jaw *a* are provided a number of rigid bosses or projections *l* to in the fixing of the vise to a bench be let into the wood of the bench for the purpose of preventing any horizontal displacement of the vise so long as the holding-down bolts for fixing the vise to the bench are in position. The handle-hole *m*² in the head of the screw *f* is cut away at its middle part *m*³ to leave only the ends of the said hole for contact with the shank *n*² of the handle *n*, in this way lessening the chance of the said handle sticking or jamming in the said hole as it moves from end to end. The said sticking or jamming is quite common in the case of the ordinary construction of handle end, which is usually formed with a one-diameter handle-hole right through, this handle and hole after a time becoming so badly worn at the ends that the fingers get pinched between the handle and the worn-away ends of the said hole.

In the second form of the invention, which is represented by the longitudinal section, Fig. 7, and the transverse section, Fig. 8, only one frictionally-gripping clip *i* is applied to embrace the screw *f*, this clip, however, having as part of it a portion *g* to take the place of the rod in the previous form of the invention. The said clips differ only from the clip in the previous arrangement inasmuch as it is made in one piece with the portion *g*, has a longer bearing on the screw,

and is of an open-work construction providing a number of spring tongues or pieces, such as *i*², which have an independent frictional contact on the part of the screw they bear against. The screw-box *d* hangs from the portion *g* by a hook-like piece *d*⁵, as in the previous form, the said portion *g* running the length of the screw and being approximately semicircular in cross-section, with a side ledge *g*², upon which the end of the hook *d*⁵ rests.

In the third form of the invention, which is represented by the longitudinal section, Fig. 9, by the transverse section, Fig. 10, and by the sectional plan of the movable jaw only, Fig. 11, only one frictionally-gripping part *i* is applied to the screw *f*, this part carrying rigid with it the rod *g*, from which the screw-box *d* is hung in its way *e*. This part *i* is a tube-like piece or sleeve fitting freely around a plain part of the screw *f*, it being adapted to make at its one end, *i*², frictional contact with the collar *s*, surrounding an adjacent part of the screw to turn at all times with the screw, there being a leather or other contact *s*² between the end *i*² and the face of the collar *s*. The part *i* abuts at its other end, *i*³, against a second collar *t*, which is also carried upon the screw *f*, this being a thrust-collar. The collar *s* is pressed into frictional contact with the part *i* by a spring *u*, this spring determining the amount of friction between the said collar and part. The said amount of friction can, however, be adjusted by the turning of the abutment-collar *t*, the outer side *t*² of which is formed with a number of sinkings of different depths for the engagement of a cross-peg *w*, carried by the screw *f*. The cross-peg, depending upon the sinkings it engages, forces the spring *u* into a more or less state of compression, thereby decreasing or increasing the amount of friction between the collar *s* and the part *i* for the adequate operation of the screw-box *d*. This form of the invention may be carried into effect without the spring *u* and the adjustment of the thrust-collar *t*.

In all the forms of the invention described the engaging and disengaging movements of the screw-box *d* are brought about by approximately one-sixth of the turn of the screw *f*.

The arrangement of the thrust-surface *e*⁴ below the line of screw engagement has another feature in addition to the one previously described—*i. e.*, it permits the movable jaw *c* to be removed from the fixed jaw *a* for cleaning, &c., by the simple disconnection of the screw-box from the rod *g* and the removal of the stop-peg *x*, it being seen from the drawings that all the parts carried by the shank *c*² of the movable jaw and which must pass the top of the said thrust-surface on said removal will be clear of the said surface.

The forms of the invention described with

the drawings, particularly the one Figs. 1 to 6, are the most desirable applications in vices of the kind referred to; but it will be understood that these forms can be modified without departing from the invention.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a bench-vise, the combination of a fixed jaw, a movable jaw working in the fixed jaw, a rotatable screw carried by the movable jaw, a screw-box rising and falling in a guideway in the fixed jaw, a frictionally-operated coupling means having a fixed position on said screw relative to longitudinal movement, and means carried by the coupling means for actuating the said box.

2. In a bench-vise, the combination of a fixed jaw, a movable jaw working in the fixed jaw, a rotatable screw carried by the movable jaw, a screw-box rising and falling in a guideway in the fixed jaw, a plurality of clips encircling the screw and longitudinally immovable with respect thereto to frictionally grip the same, and a connecting-link between the said clips and the screw-box for actuating the latter.

3. In a bench-vise, the combination of a fixed jaw, a movable jaw working in the fixed jaw, a rotatable screw carried by the movable jaw, a screw-box rising and falling in a guideway in the fixed jaw, frictional gripping-clips on said screw, a bar connecting the said clips, and means for attaching said screw-box to said bar.

4. In a vise, the combination of a fixed jaw-section, a movable jaw-section having a rotatable screw in said movable section, a screw-box longitudinally immovable with respect to the fixed section, and an automatic means having a fixed position on said screw and movable therewith for causing the screw-box to engage and disengage the screw.

5. In a parallel bench-vise, the combination of a fixed jaw, a movable jaw working in said fixed jaw, a rotatable screw carried by the movable jaw, a screw-box rising and falling in a guideway in the fixed jaw so that when the screw engages the screw-box the thrust between the said box and the fixed jaw is below the lowest line of the screw engagement, frictionally-gripping clips on said screw and having a fixed position relative to longitudinal movement thereof, a bar connecting the said clips, and means for connecting the said screw-box to the said bar.

6. In a parallel bench-vise, the combination of a fixed jaw, a movable jaw working in said fixed jaw, a rotatable screw carried by the movable jaw, a screw-box rising and falling in a guideway in the fixed jaw, and means longitudinally immovable on the screw and provided with a member between the said screw and the said box for actuating the latter.

7. In a parallel bench-vise, the combination

of a fixed jaw having upon the under side of its base a series of rigid bosses, a movable jaw working in said fixed jaw, a rotatable screw carried by the movable jaw, a movable member rising and falling in a guideway of the fixed jaw for gripping the said screw and a frictionally-operated connecting means cooperating with the movable member and the said screw, and longitudinally immovable with respect to the latter.

8. In a parallel bench-vise, the combination of a fixed jaw, a movable jaw working in said fixed jaw, a rotatable screw working in the movable jaw, a gripping member working in a guideway in the fixed jaw and an automatic frictionally-operated coupling means having an element longitudinally immovable on the screw for actuating the said member, said element cooperating with the rotatable screw and the said member.

9. In a vise the combination of a fixed jaw-section, a movable section, having a rotatable screw in said movable section, a movable screw-box in said first-mentioned section, means movable with the screw for causing the screw-box to engage and disengage the screw, and an automatic frictional means for gripping the screw.

10. In a vise the combination of a fixed jaw-section, a movable jaw-section, having a rotatable screw in said movable section, a movable screw-box in said first-mentioned section, means movable with the screw causing the screw-box to engage and disengage the screw, an automatic frictional means for gripping the screw, and guides for the screw-box.

11. In a vise having a movable jaw-section, a rotatable screw carried by the said movable section, a movable box having a fixed position relative to the longitudinal movement of the screw in one of the jaw-sections for engaging and disengaging the screw, automatic frictional grip-collars carried by the screw, a spring for regulating the friction, and means movable with the screw carried by the collars for causing the said box to engage and disengage the screw.

12. In a parallel bench-vise, a fixed jaw, a movable jaw having a hollow and open-bottom shank to work in and out of the said fixed jaw, a rotatable screw applied to the movable jaw in the interior of said shank to slide with the said movable jaw, a screw-box provided in the fixed jaw below the rotatable screw and disposed so that it will permit sliding of the movable jaw from the fixed jaw, and frictional means applied to the screw to lift the screw-box into engagement and allow it to fall out of engagement.

13. In a bench-vise, a fixed section having a jaw, a movable section having a jaw, mounted in the first-mentioned section, a rotatable screw in said movable section, means having a fixed position relative to the longitudinal movement of the screw for engaging and dis-

engaging the same, and an automatic frictional gripping means having a member on the screw and movable therewith for actuating the first-mentioned means.

5 14. In a bench-vise, jaws, at least one of the same being movable, a rotatable screw carried by said movable jaw, a member having a fixed position relative to the longitudinal movement of the screw for engaging and disengag-
10 ing the same, and a frictionally-gripping means including an element carried by the screw and movable therewith for automatically actuating the said member.

15 15. In a parallel bench-vise, the combination of a fixed jaw, a movable jaw working in

the fixed jaw, a rotatable screw having a hand-operable means to actuate the same carried by the movable jaw, a gripping element longitudinally immovable with respect to the fixed jaw for engaging and disengaging the screw, 20 and an automatic coupling means having a member moving with the screw for actuating the said element.

In testimony whereof I have hereunto set my hand in the presence of two subscribing 25 witnesses.

GEORGE BENJAMIN TAYLOR.

Witnesses:

GEO. T. FUERY,

ROSE WOOLF.