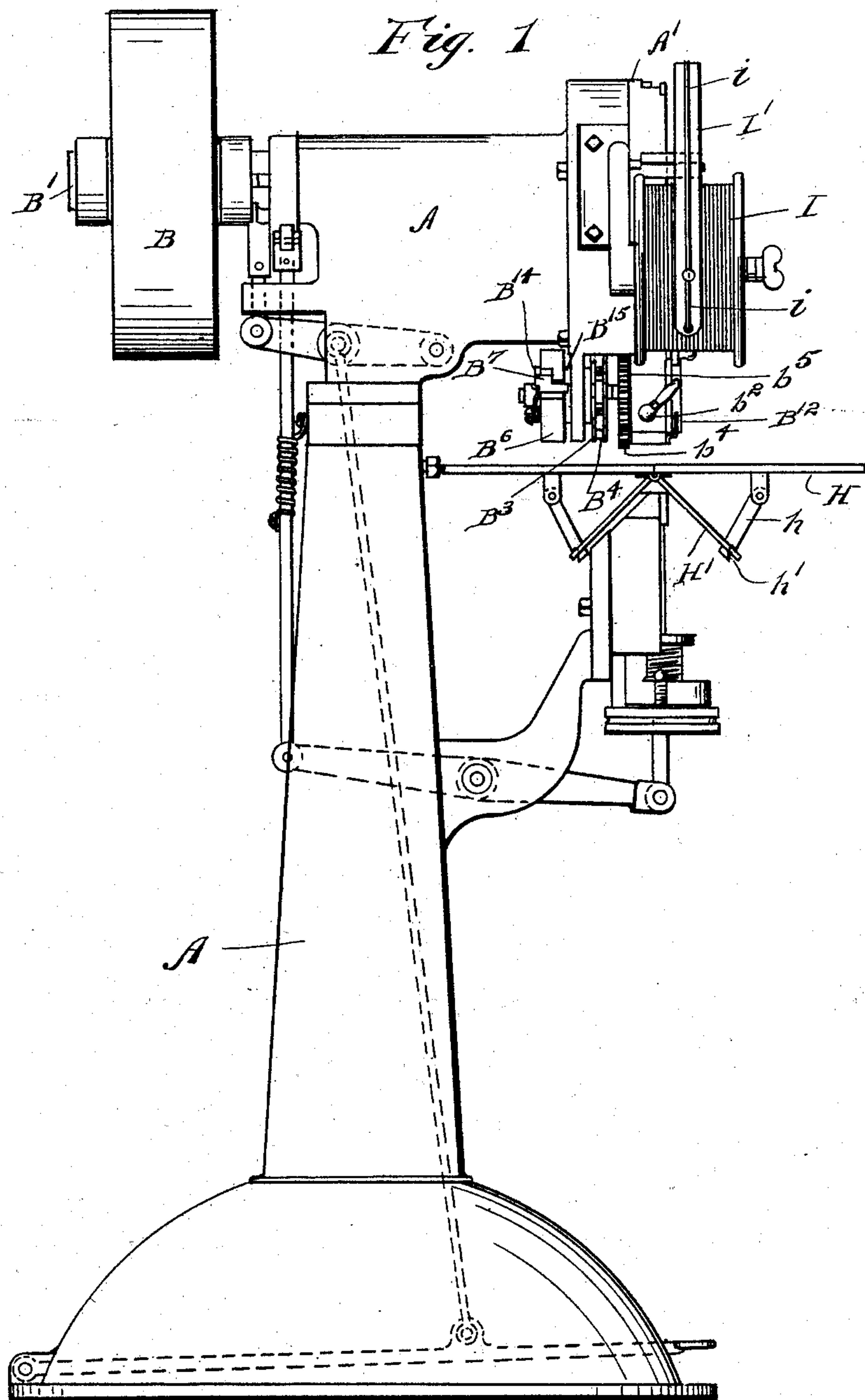


F. P. ROSBACK.
WIRE STITCHING MACHINE.

(Application filed June 5, 1901.)

(No Model.)

7 Sheets—Sheet 1.



Witnesses:

G. S. Noble
M. H. Colahan

Inventor,

Frederick Peter Rosback
By his atty. Chas. Blodgett

No. 706,690.

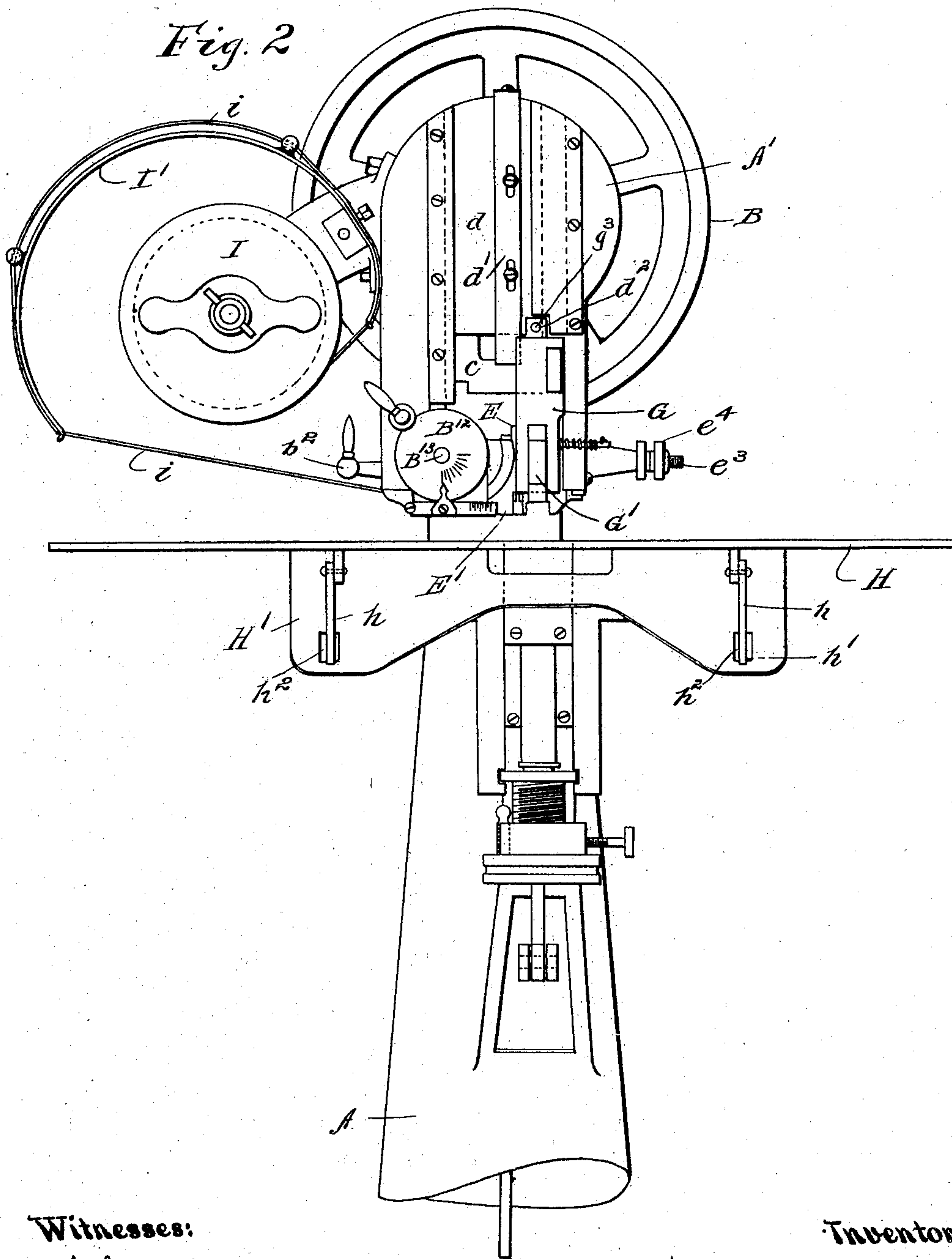
Patented Aug. 12, 1902.

F. P. ROSBACK.
WIRE STITCHING MACHINE.

(Application filed June 5, 1901.)

(No Model.)

7 Sheets—Sheet 2.



Witnesses:

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F. P. ROSBACK.
WIRE STITCHING MACHINE.

(Application filed June 5, 1901.)

(No Model.)

7 Sheets—Sheet 3.

Fig. 3.

Fig. 8

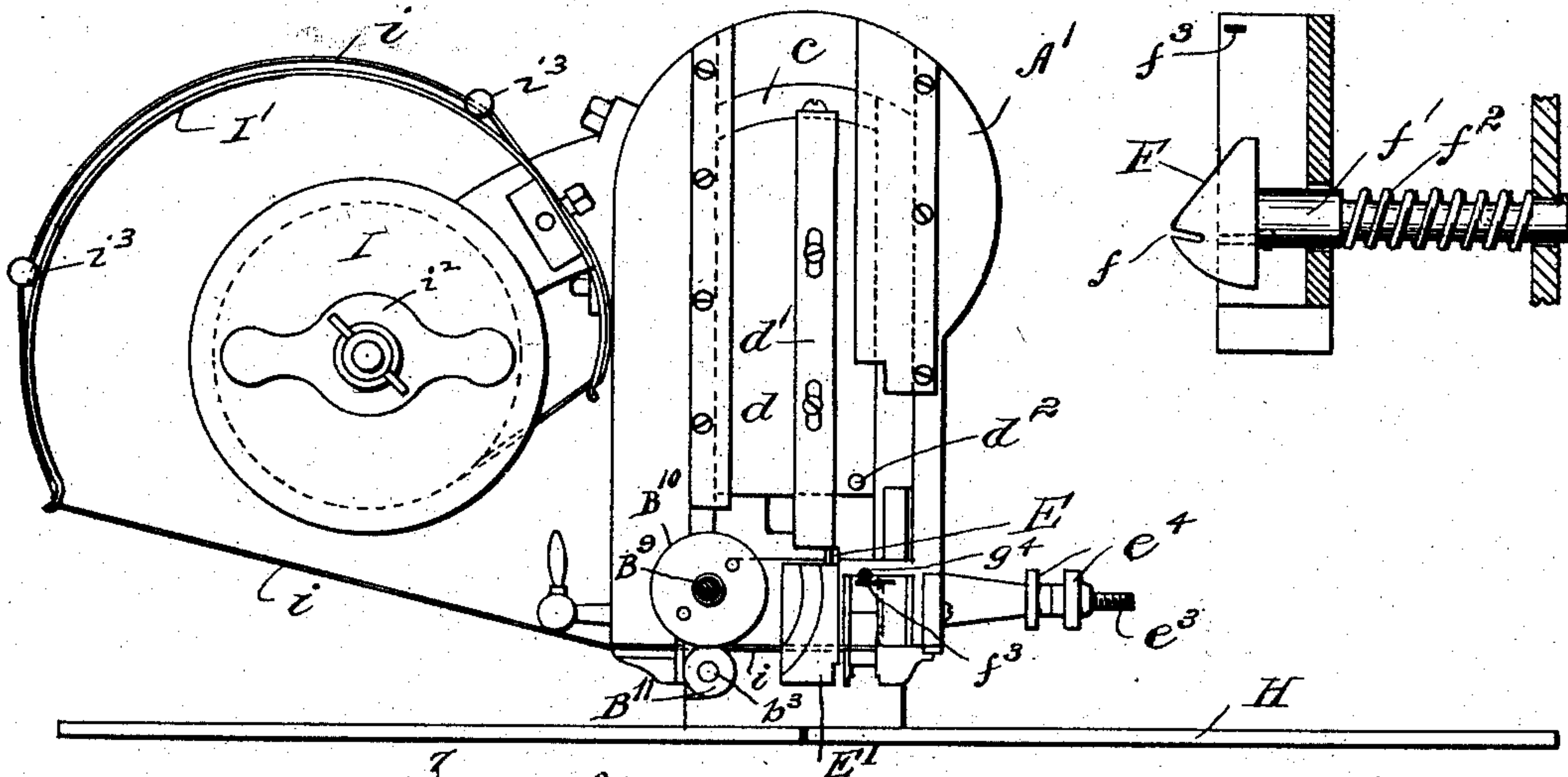
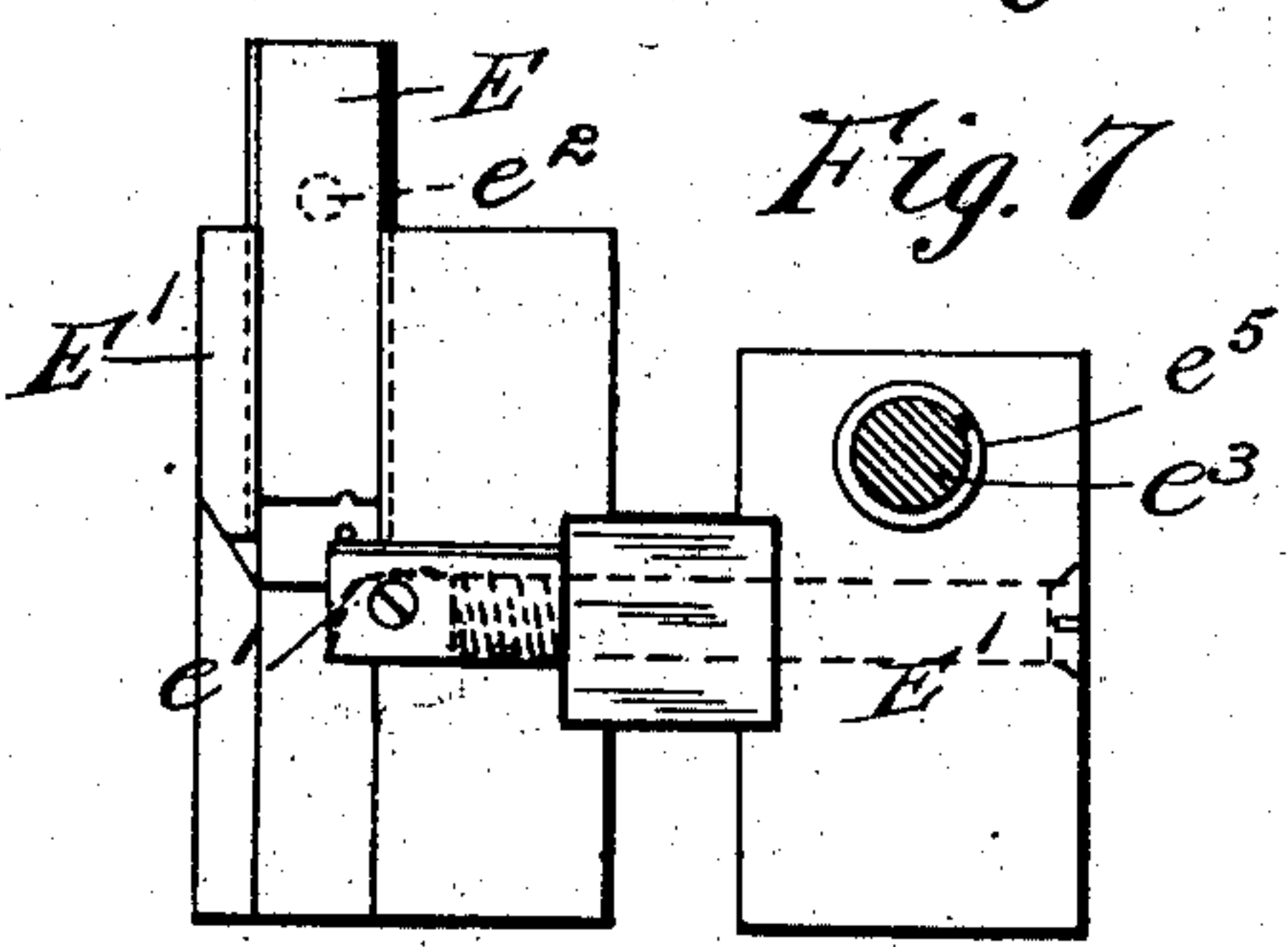
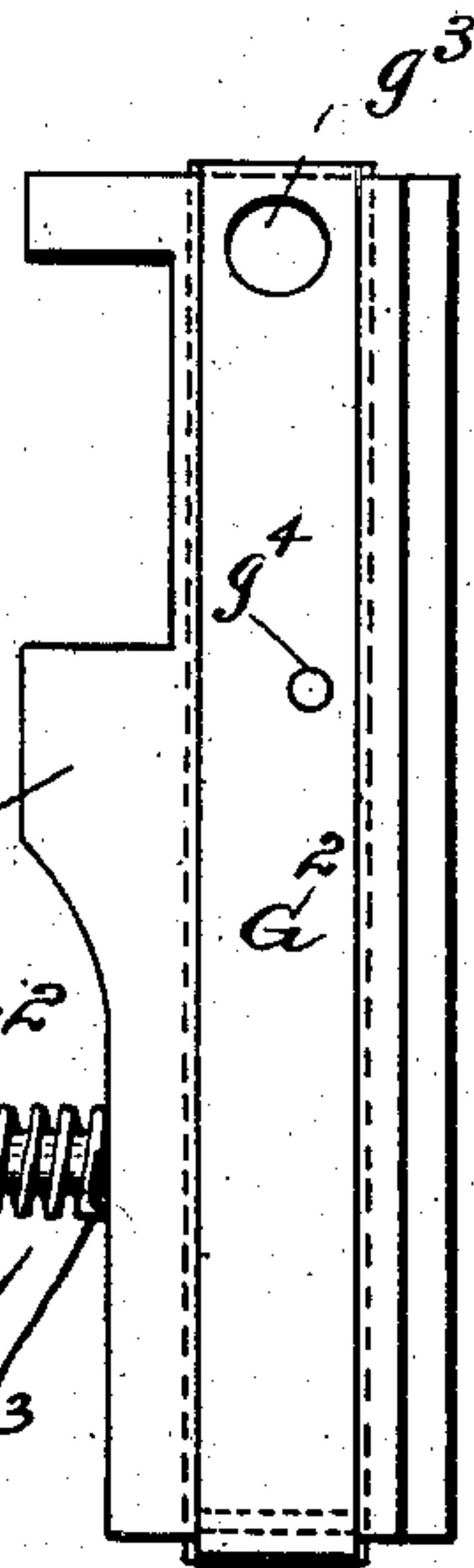
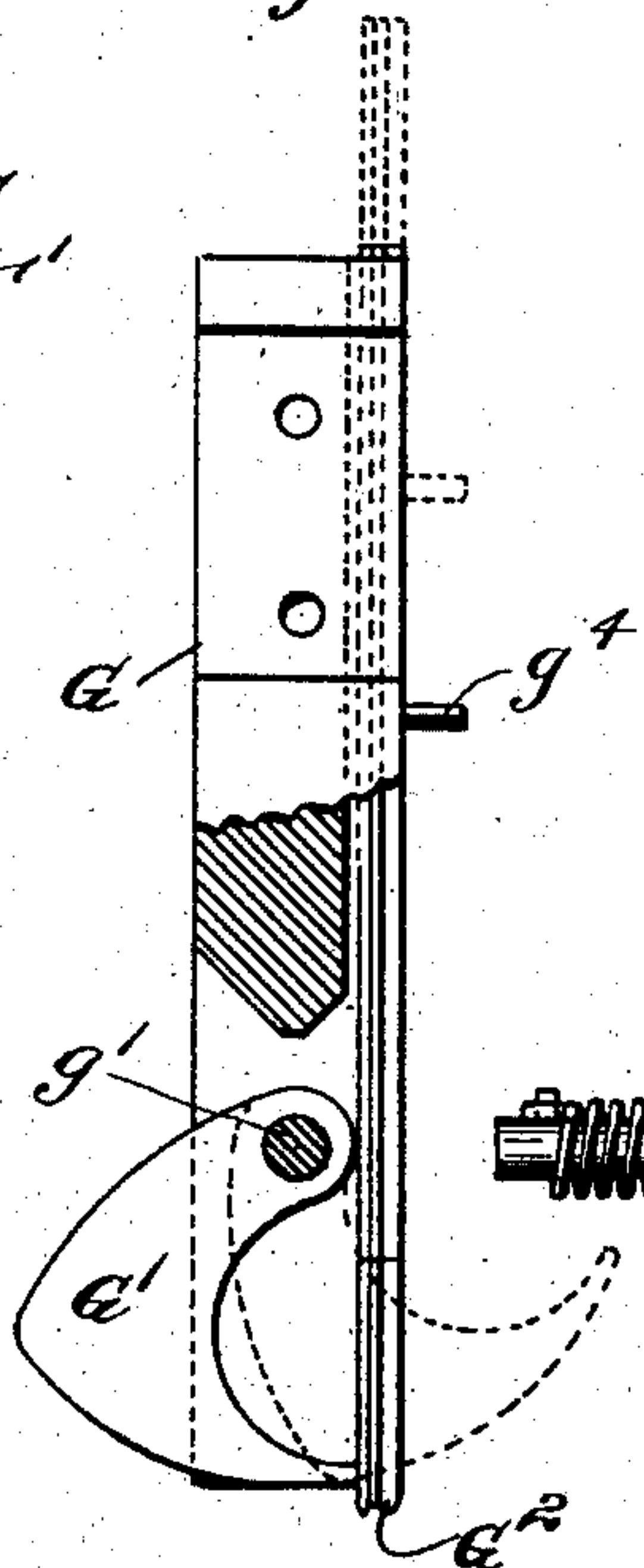
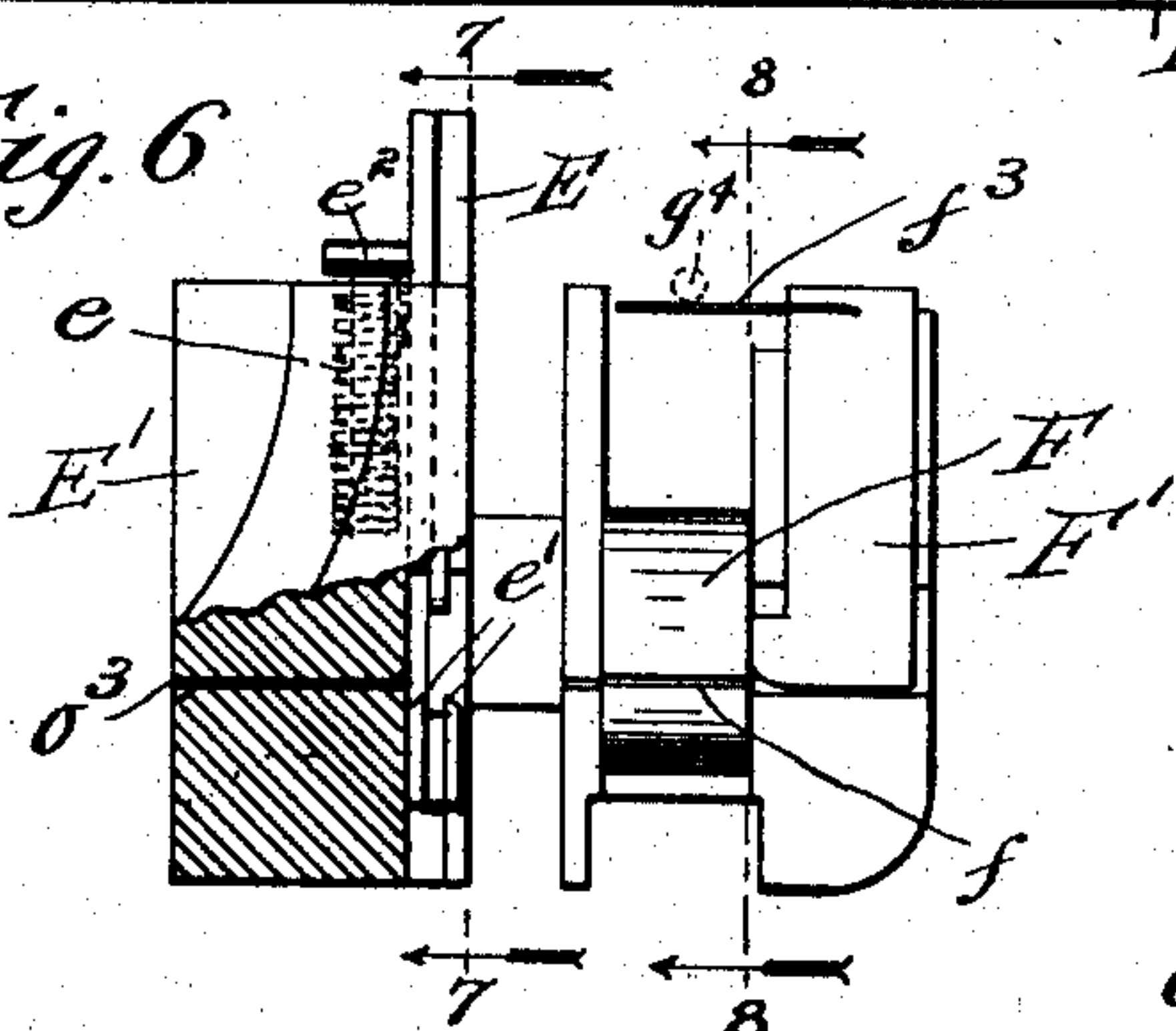


Fig. 6

Fig. 4

Fig. 5



Witnesses:

J. S. Noble
M. H. Colahan

Inventor,

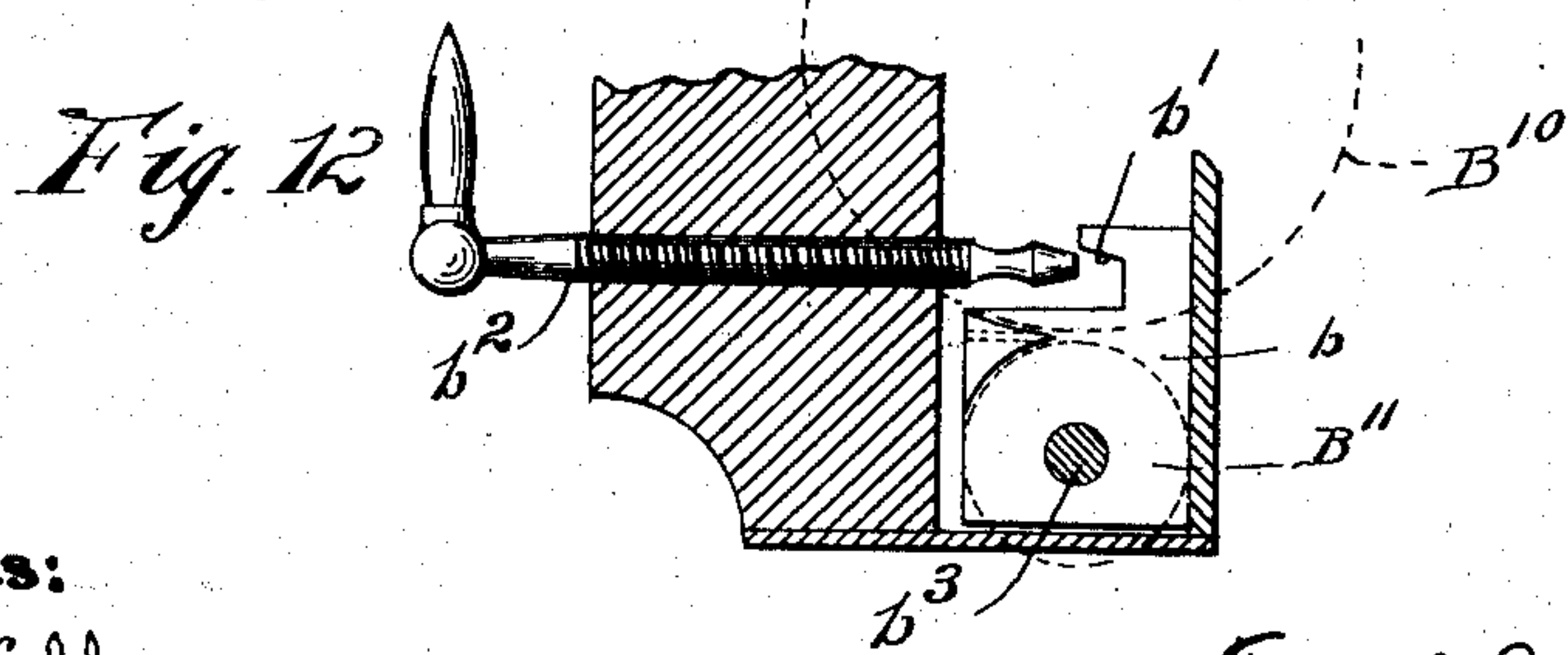
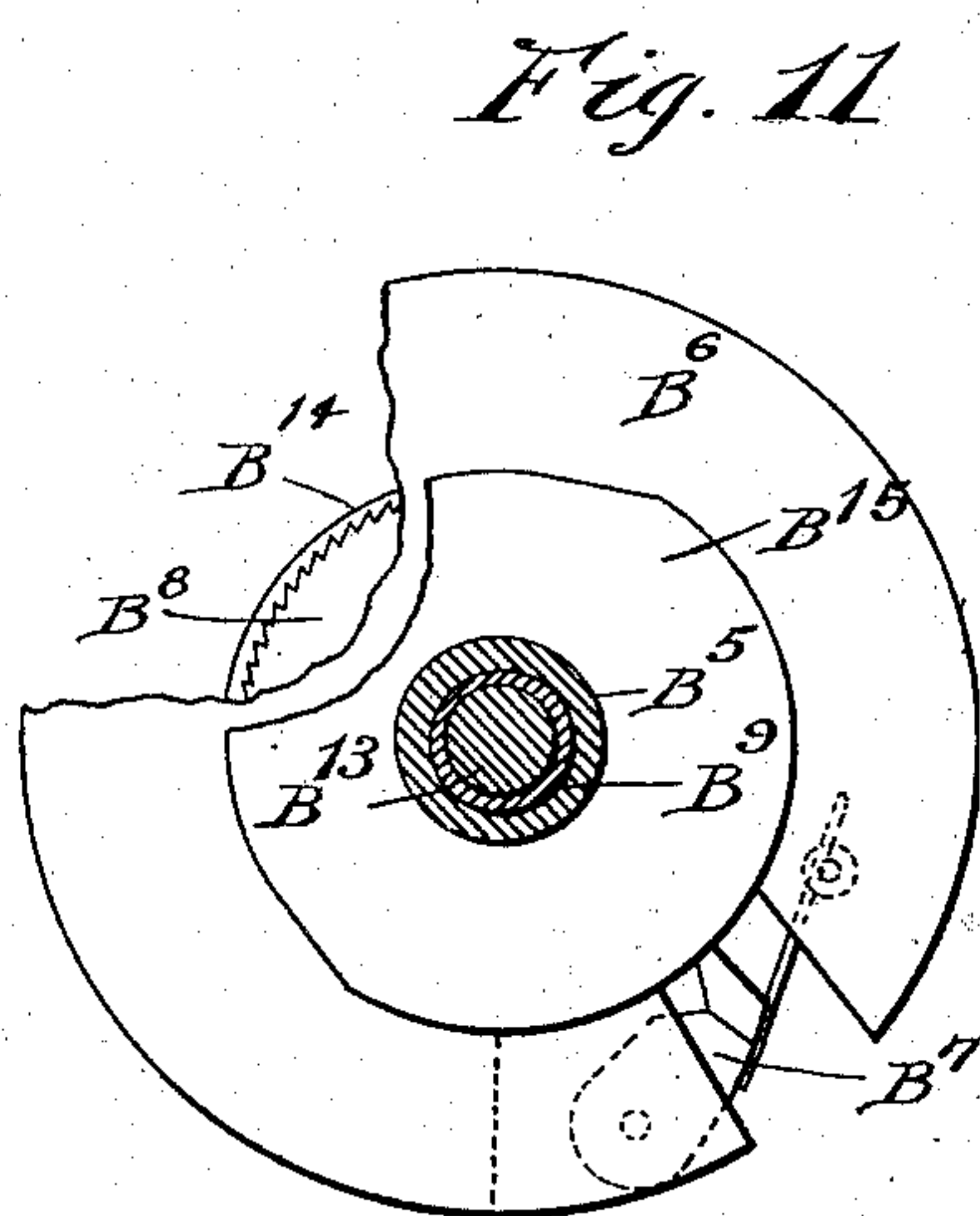
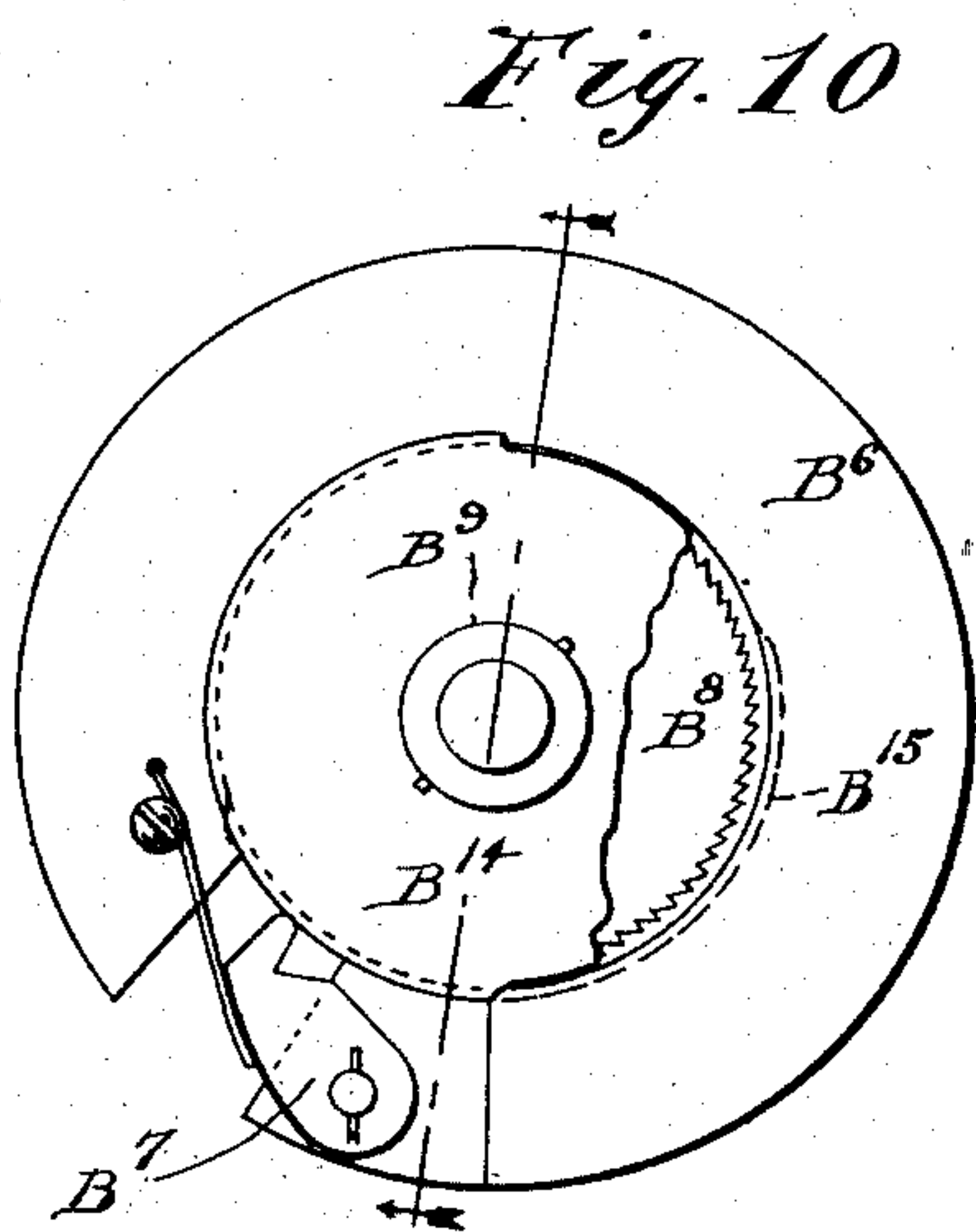
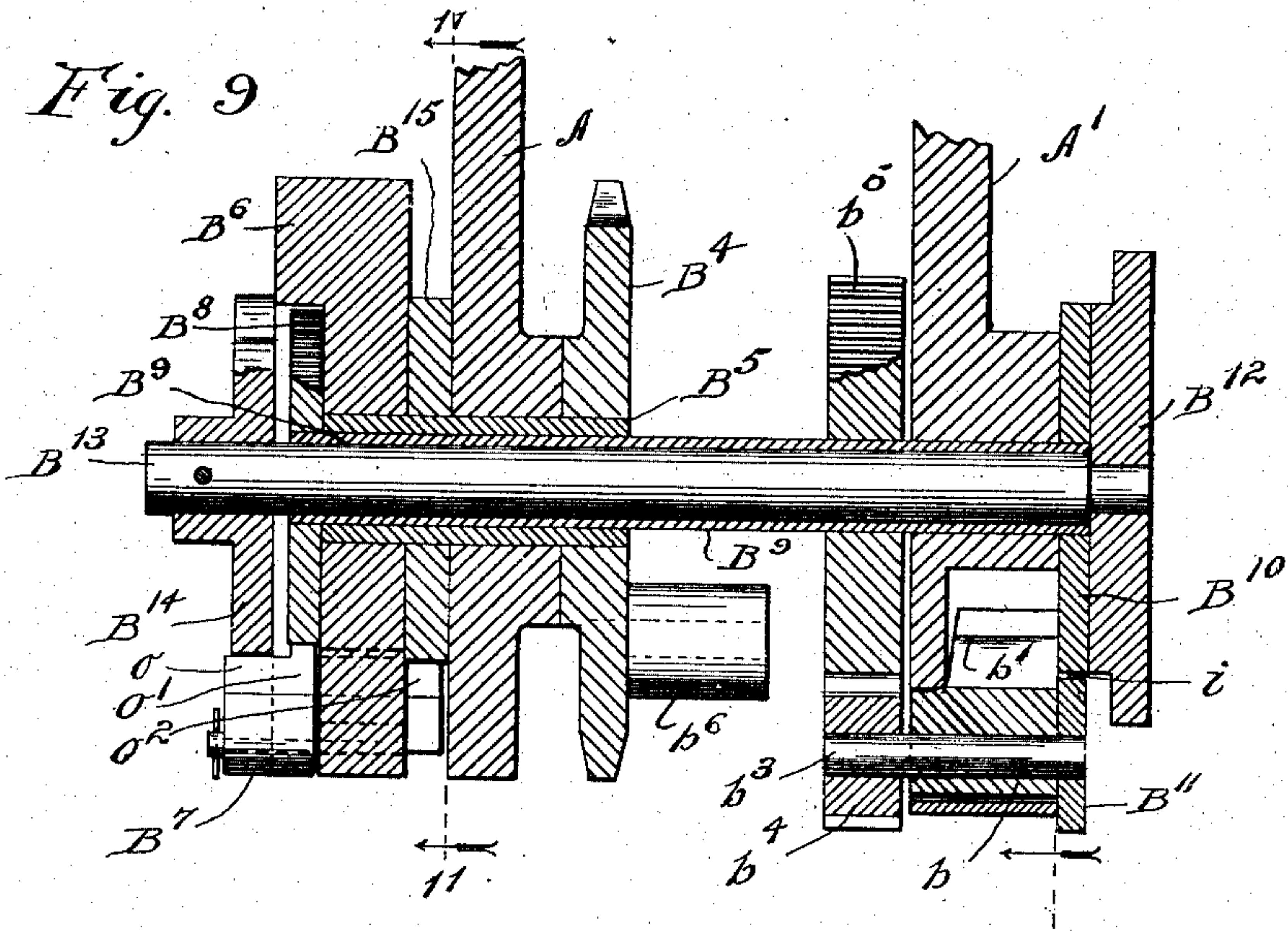
Frederick Peter Rosback
By his atty. Charles Colahan

F. P. ROSBACK.
WIRE STITCHING MACHINE.

(Application filed June 5, 1901.)

(No Model.)

7 Sheets—Sheet 4.



Witnesses:

G. S. Noble
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No. 706,690.

Patented Aug. 12, 1902.

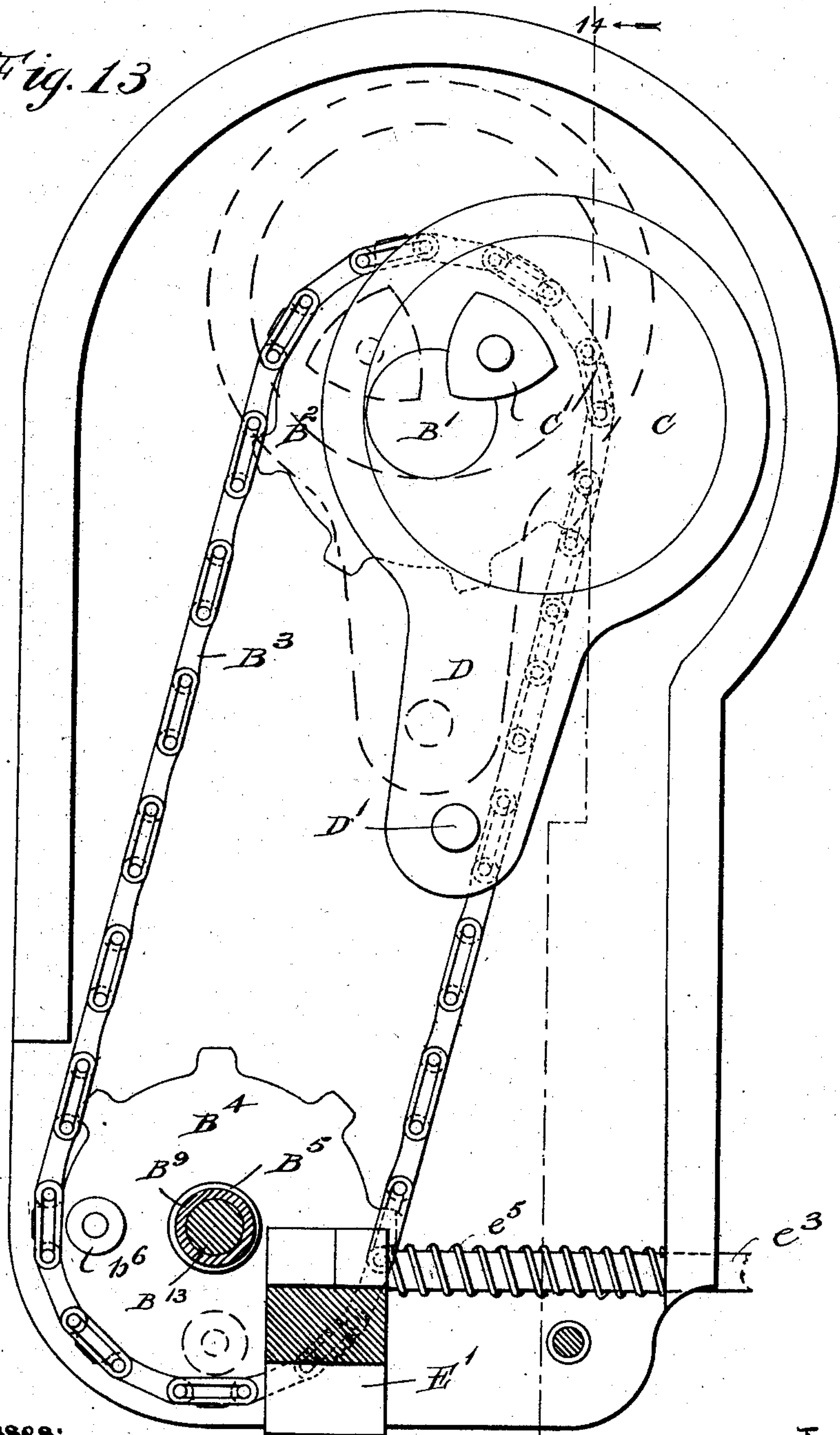
F. P. ROSBACK.
WIRE STITCHING MACHINE.

(Application filed June 5, 1901.)

(No Model.)

7 Sheets—Sheet 5.

Fig. 13



Witnesses:

G. S. Noble
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No. 706,690.

Patented Aug. 12, 1902.

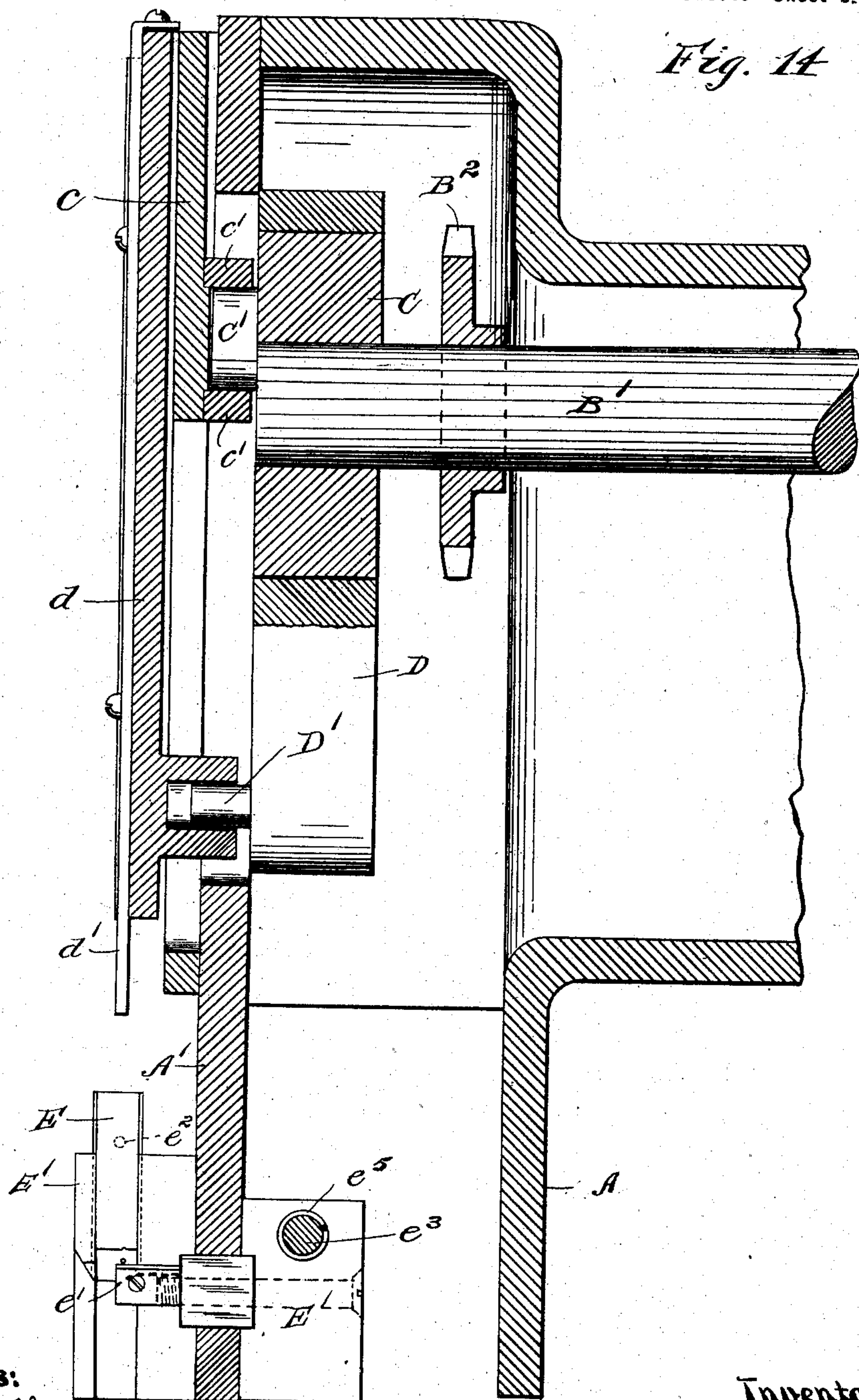
F. P. ROSBACK.
WIRE STITCHING MACHINE.

(Application filed June 5, 1901.)

(No Model.)

7 Sheets—Sheet 6.

Fig. 14



Witnesses:

B. S. Noble
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F. P. ROSBACK.
WIRE STITCHING MACHINE.

(Application filed June 5, 1901.)

(No Model.)

7 Sheets—Sheet 7.

Fig. 15

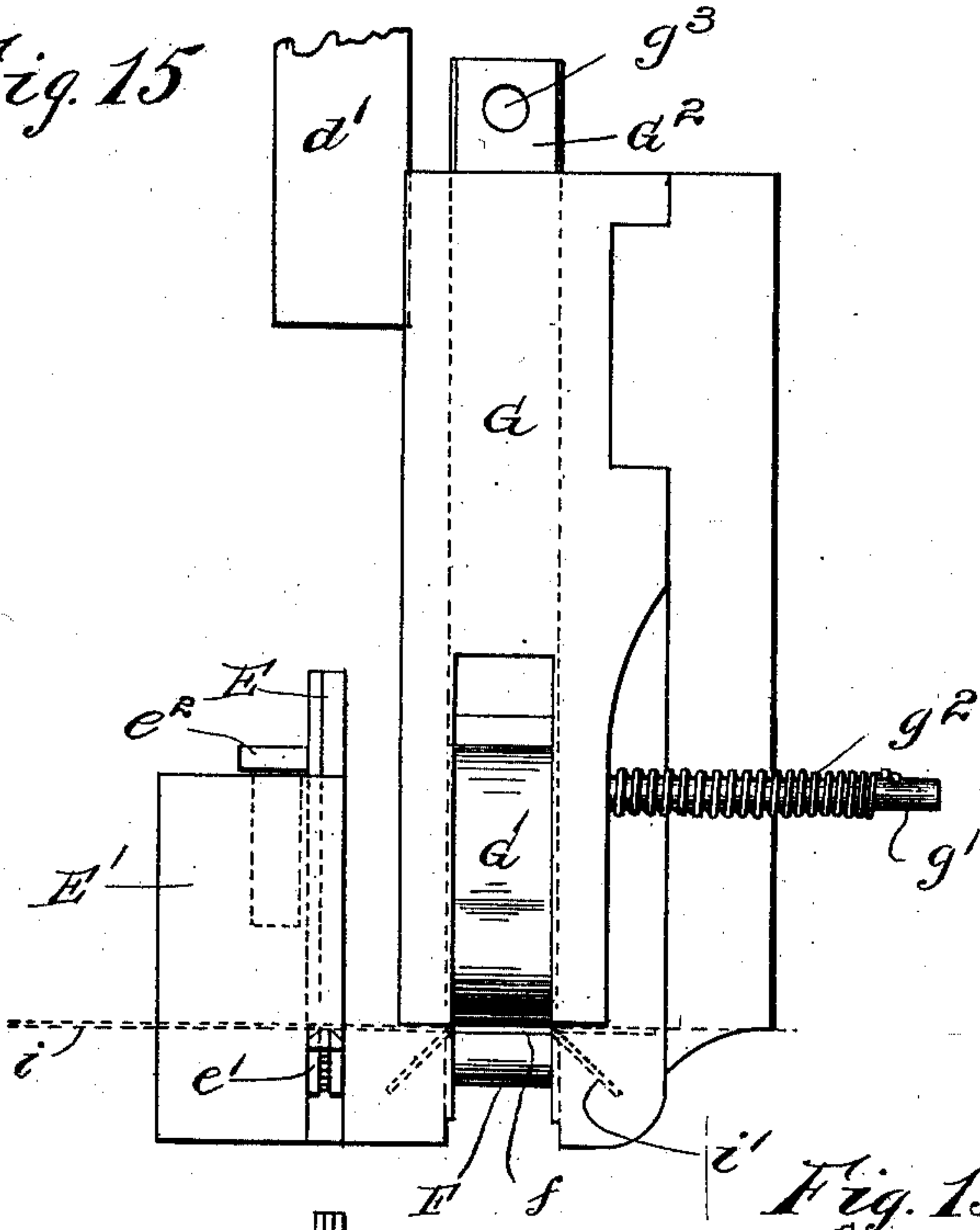


Fig. 16

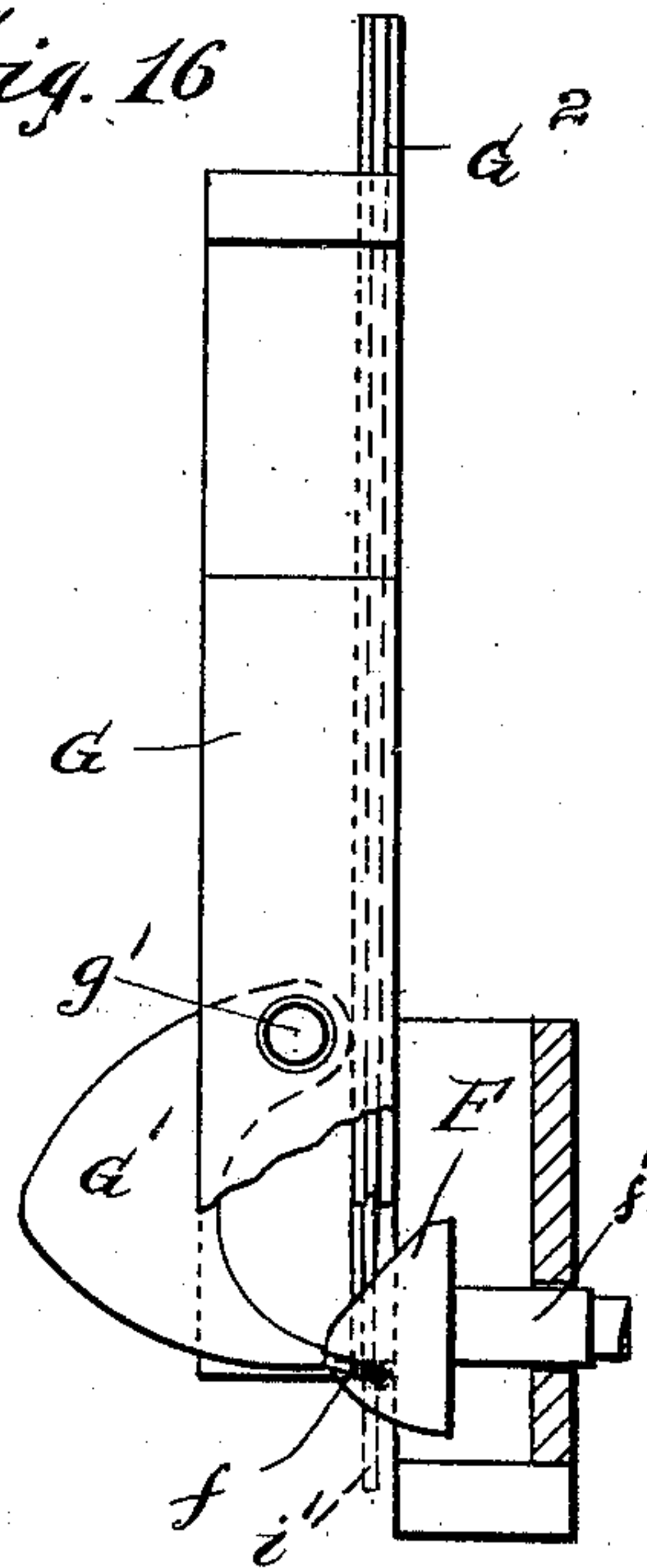


Fig. 17

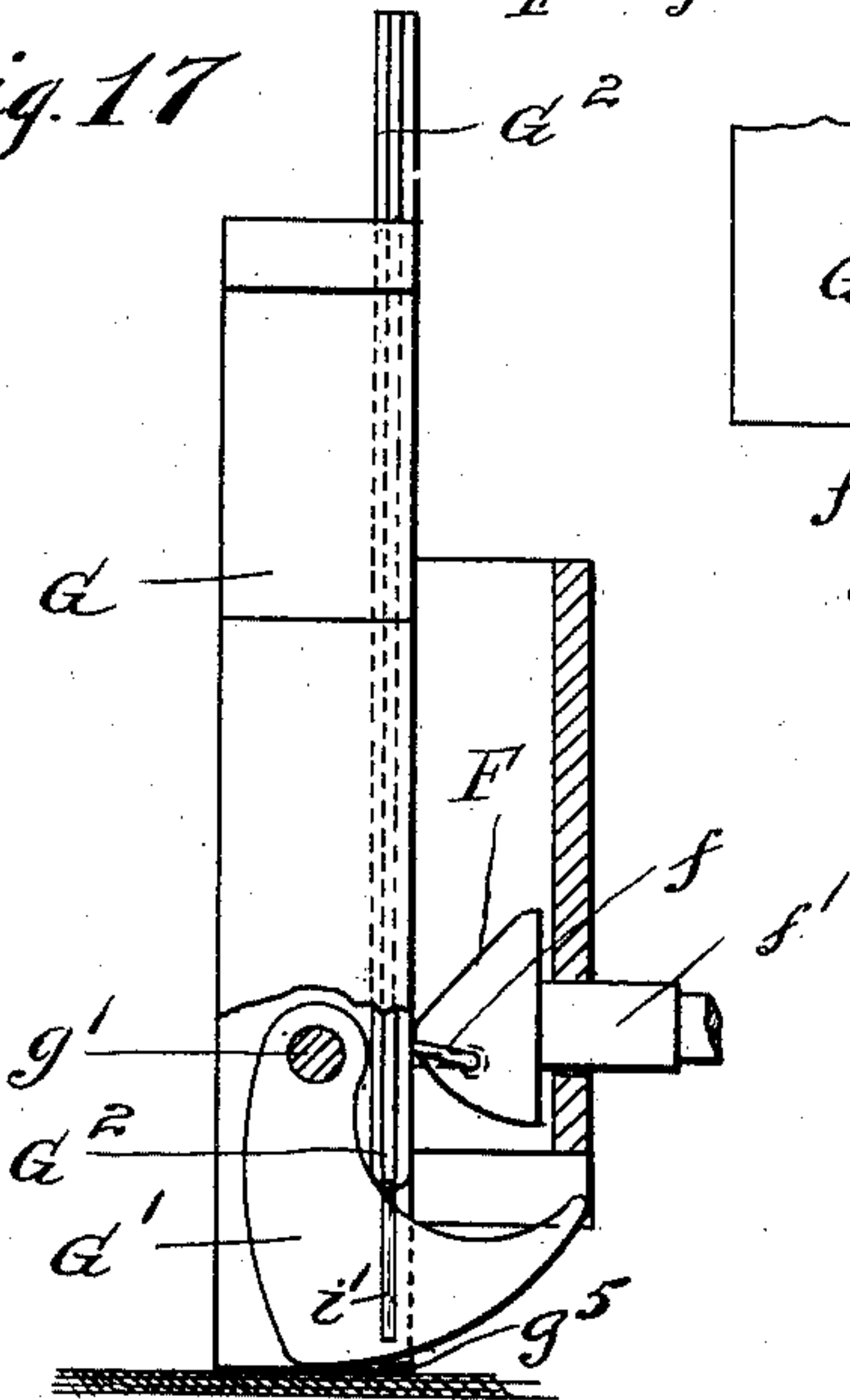


Fig. 19

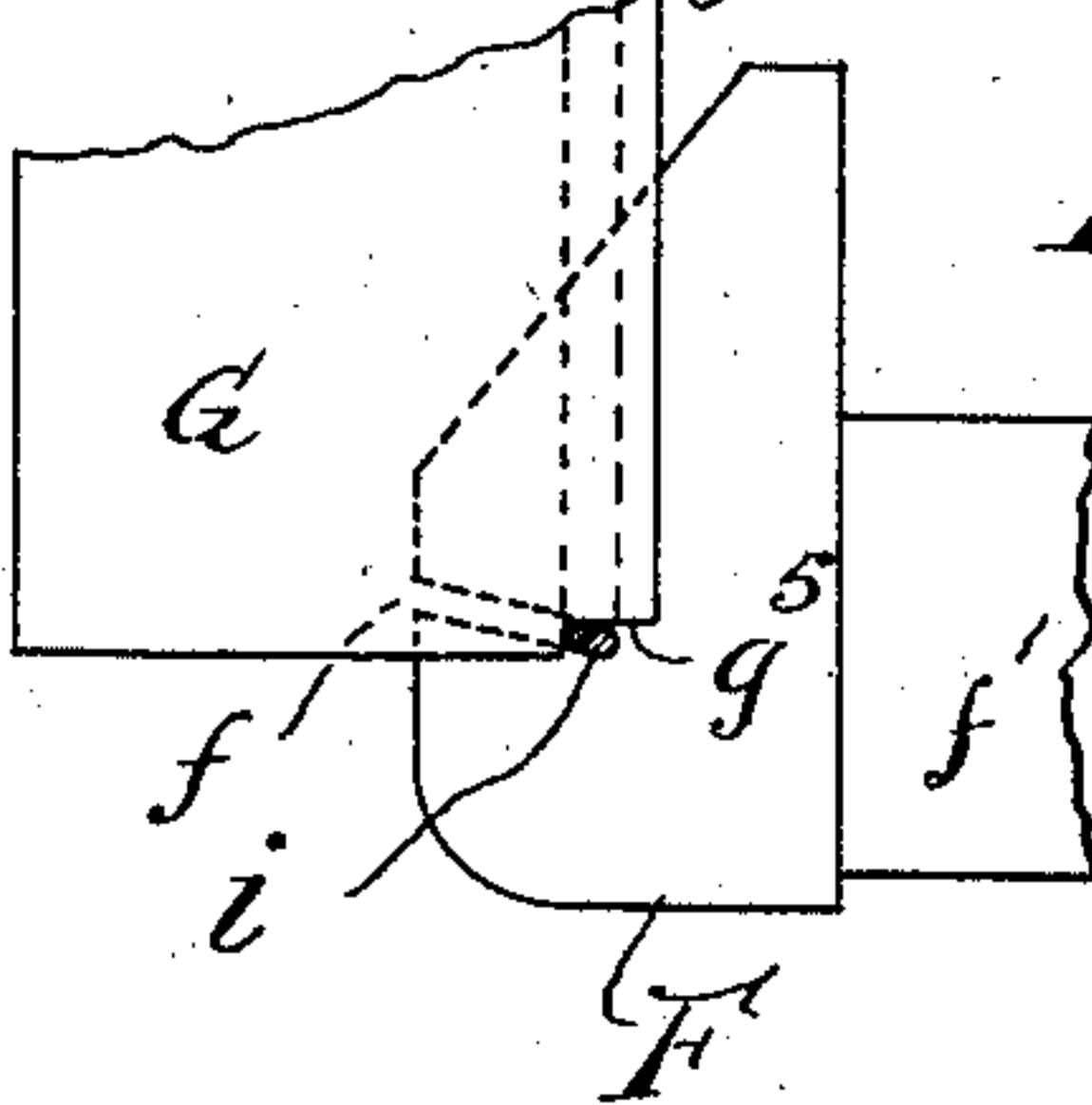
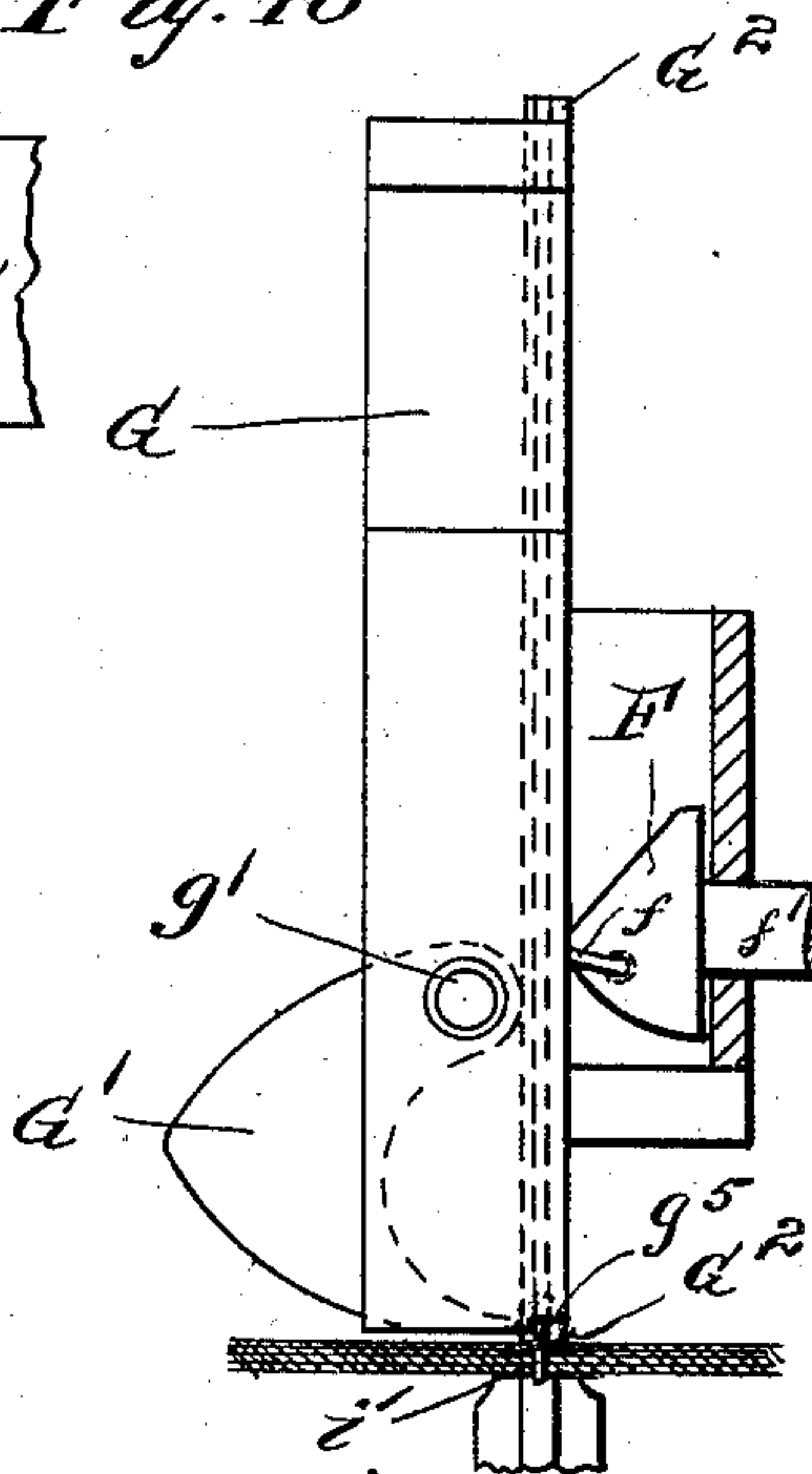


Fig. 18



Witnesses:

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M. H. Colahan

Inventor.
Frederick Peter Rosback
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UNITED STATES PATENT OFFICE.

FREDERICK PETER ROSBACK, OF CHICAGO, ILLINOIS.

WIRE-STITCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 706,690, dated August 12, 1902.

Application filed June 5, 1901. Serial No. 63,335. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK PETER ROSBACK, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wire-Stitching Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to improvements in wire-stitching machines in which wire staples are formed by being cut from a continuous spool of wire, the cutting mechanism severing a piece from between the two ends, leaving the ends on each side of the two-edged knife square and straight, the cut-out piece escaping downwardly between the knife-edges. This wire is advanced or fed intermittently from the spool by a feeding device that is adjustable to secure any predetermined length of wire to be cut off and formed into a staple and forced or driven through the material and fastened by clenching.

Many of the features and operations of this machine shown in the present drawings are also shown in my former patents, No. 493,298, March 14, 1893, and No. 640,417, January 2, 1900, and it will be unnecessary to make further particular reference to same, but only to that to which my present invention relates, which consists in improvements in the chain-drive-gear mechanism for actuating the parts and in the manner of regulating the tension on the wire between the spool and the feed-rolls and in adjusting and regulating the rotary movement of the feed-rolls to secure any desired length of wire for forming into staples and also in the novel construction of the adjustable box or trunnion of the lower feed-roll; also, in the manner of cutting the wire from which the staple is formed to secure square ends to the staples that it may be forced in a direct straight line through the material.

The invention further relates to the manner of holding the staple-piece by means of an upward-inclined slot of the horizontally-reciprocating spring-actuated anvil, that is forced outward to bring the piece of wire in position under the staple-driving bar within the notches of the bending-bar, upon each side thereof, and has vertical grooves on each side and simultaneously moves downwardly along

the opposite sides of the plunger or anvil, which is gradually withdrawn as the curved swinging staple-supporter keeps the wire within the vertical groove on each side, thereby forming the staple, which is then forced downwardly through the material, as shown in my former patent.

In the drawings, Figure 1 is a side elevation of my machine. Fig. 2 is a front view. Fig. 3 is a broken front elevation with the dial-plate removed, showing the wire between the feed-rolls. Fig. 4 is a side sectional view of the staple-driving bar and its swinging staple-supporter, which is the same as in my former patent. Fig. 5 is a front view of same. Fig. 6 is a sectional front view of the cutting and holding devices. Fig. 7 is a sectional edge view of the cutting device on line 77 of Fig. 6. Fig. 8 is a sectional side view of the anvil on line 88 of Fig. 6. Fig. 9 is a sectional view of the adjustable wire-feeding device. Figs. 10 and 11 are sectional views of the adjustable wire-feed-regulating device, showing the pawl-bearing wheel keyed to its shaft and the ratchet-bearing wheel secured to the sleeve-shaft. Fig. 12 is a sectional view of the adjustable feed-roll that provides enlarged or contracted space between the rolls for different sizes of wire that is to be fed into the machine. Fig. 13 is a sectional view of the increased driving-sprocket wheels and chain and reciprocating cams that actuate the staple forming and cutting plates. Fig. 14 is a sectional view of the same on line 1414 of Fig. 13. Fig. 15 is a front elevation of the knife, the anvil, and the vertically-reciprocating staple forming or bending bar. Figs. 16, 17, and 18 are side elevations of same in various positions of operation, to be hereinafter referred to. Fig. 19 is a sectional view of the angularly upwardly formed slot of the horizontally-reciprocating spring plunger or anvil as it has been advanced by its actuating-spring to place the wire within the horizontal holding-notches under the vertically-reciprocating staple forming or bending bar, that presses it down over the anvil.

In the drawings similar letters refer to similar parts throughout the several views.

A is the main frame of the machine.

A' is the guide-plate secured to the front of the main frame.

B is the power-wheel; B', its shaft; B², the sprocket-chain drive-wheel secured thereto; B³, its sprocket-chain, actuating the wire-feed pinion B⁴, secured on the sleeve-shaft B⁵, that carries the pawl-bearing wheel B⁶, in which is journaled the pawl B⁷, that contacts with the ratchet-wheel B⁸, that is secured to the sleeve-shaft B⁹, which shaft has secured on its outer end the large feed-roll B¹⁰. To this shaft is also secured the gear drive-wheel b⁵, that engages with a pinion b⁴, secured to the shaft b³, that actuates the small vertically-adjustable feed-roll B¹¹, which supports the wire beneath the large fixed feed-roll B¹⁰. This vertically-adjustable feed-roll is supported in a bearing b within the guide-plate A' and has a slight oscillatory movement of its shaft and still maintains the pinion in contact with its actuating-wheel. This bearing is provided with a tapered projecting flange b', (see Fig. 12,) that is controlled in its oscillation by means of the taper-pointed adjusting-screw b² to secure the proper tension of the feed-rolls upon one edge of the wire i as it passes between the two feed-rolls.

It is well known that book-stitching wire is usually flat or oval in form, and in the matter of applying the tension in its use the pressure on the edge of the wire secures better results than upon the top of the wire, as the very slight variation of the wire surfaces which is liable to occur will cause the feed-rolls to hold it too tight and not feed it forward with the certainty that it will when the feed is applied more on one edge, which always secures forward movement of the wire, and it is not liable to break in use.

The various desired lengths of wire required for staples to be used in material of different thicknesses is readily secured by the adjustment of the feed-regulating dial-plate B¹², that is at the front of the machine, and as it is rotated or adjusted the shaft B¹³, to which it is secured, will also revolve the plate B¹⁴, secured to the end of the shaft and provided with a cam on its periphery and adjustable to various positions for contact with the heel projection O on the pawl B⁷, which pawl when traveling on the higher portion of the cam has its contacting feed-actuating point O' held out of contact with the feed-actuating ratchet-wheel B⁸, secured to the sleeve-shaft B⁹, that actuates the large feed-roll B¹⁰, while it is permitted to enter into contact with the ratchet-wheel when traveling on the lower portion of the cam. The pawl B⁷ also has a projecting lug O², farther along on its heel end, that passes through the flange-wheel B⁶ and at intervals bears on a stationary cam-plate B¹⁵, that is attached to the main frame to cause the raising of the point of the pawl and its release from contact with the ratchet as the lug O² travels upon the higher surface on the periphery of the cam-plate B¹⁵, and I thus provide an adjustable intermittent feed of the wire i, that is held between the feed-rolls B¹⁰ and B¹¹. As the stapling-wire is advanced by

the feed-rolls it passes through the groove O³ of the cutter-block E' and over the blades of the grooved knife e' and into the upwardly-inclined slot f of the horizontally-reciprocating anvil F and under the gripping-holder F', that is elastically held down by its spring f³, that rests against its holding-pin g⁴. At this point the stapling-wire rests over the blades of the knife, when it is cut off by means of the punching-die E, that is actuated by contact with the vertically-reciprocating driving-plunger d', as shown in Figs. 6, 7, and 15. This knife or die e' is provided with a groove having a cutting edge on each side, and the punching-die E presses down upon the wire, and thus cuts out a section of wire between the portion which is to form the staple and the spool-strand, leaving the two ends square, the cut-out section falling into the groove between the knives, from which it escapes outwardly. I thus simultaneously cut the staple-wire on each side of the supporting-groove formed by the two knives to leave the ends square, that they may be forced through the material in a direct line, and having square ends it prevents divergence of the staple while being forced downward in a straight line through the material. The cut piece of wire from which the fastening-staple is formed is now held within the upwardly-inclined groove f of the reciprocating anvil, which is in position shown in Figs. 17 and 18, the ends of the wire extending equal distance downwardly on each side therefrom. When the driver G² and vertically-grooved former G rise, the anvil F, with its upwardly-inclined slot in which the piece of wire is held, will be forced forward by its spring f² and enter the vertical groove of the former G, as shown in Figs. 15, 16, and 19, forcing the wire in the holding notch or groove g⁵, that serves as a stop to arrest it at the base and right-hand corners of the former G, (see Fig. 19,) and the former G now descends, and the ends of the wire projecting from the anvil being thus held in proper position will be caused to enter the vertical grooves and the anvil forced back therefrom as the staple is supported on the swinging guide-arm G', that holds it in the vertical grooves on each side thereof in the formation and driving of the staple, same as shown in my former patent. This swinging guide-arm is supported on shaft g', to which it is keyed. This shaft is provided with a coiled spring g², that is secured to the shaft at its outer extended end in any well-known manner, while its inner end has a bent finger g³, that contacts with the face of the vertically-grooved former G at its outer edge and holds the swinging arm G' in place as it is moved in and out during its vertical reciprocations in the formation and driving of the staple.

The wire is supplied from the spool I, which has the ordinary spring-tension pressure-plate i² at each end, and I have provided an intermediate elastic friction take-up and tension-

spring I', over which the wire passes as it leaves the spool, it having frictional contact with its guiding-eyes i^3 and the periphery of the spring, which imparts more or less friction to the wire, and it also provides an intermediate elastic take-up to prevent slack in the wire and keep it taut and admits its being fed intermittently by taking up the slack wire, which will give sufficient wire to form a staple without causing the spool to revolve at this moment, and the slack wire held by the take-up is yielded to afford sufficient length of wire for this purpose, the spool being at all times free to revolve and supply the tension-take-up spring.

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

1. In a wire-stitching machine, the wire-feeding device, consisting of the main drive-wheel B, its shaft B', the sprocket-wheel B² secured thereto, its drive-chain B³ communicating a rotary motion to the sprocket-pinion B⁴ that revolves the sleeve-shaft B⁵ actuating the pawl-bearing wheel B⁶ secured thereto, and provided with pawl B⁷ that contacts with ratchet-wheel B⁸ for imparting motion to the sleeve-shaft B⁹, and the feed-roll B¹⁰ secured thereto, combined with the geared drive-wheel b^5 that causes the pinion b^4 to actuate the feed-roll B¹¹ substantially as shown and described.

2. In a wire-stitching machine, the wire-feeding device consisting of the main drive-wheel B, its shaft B', the sprocket-wheel B² secured thereto, its drive-chain B³ communicating a rotary motion to the sprocket-pinion B⁴ for rotating the sleeve-shaft B⁵ and the pawl-bearing wheel B⁶ secured thereto, that is provided with pawl B⁷ that contacts with ratchet-wheel B⁸ for actuating the sleeve-shaft B⁹ having the feed-roll B¹⁰ secured

thereto, and the geared drive-wheel b^5 that imparts motion to the pinion b^4 and its shaft b^3 and the feed-roll B¹¹, combined with the dial-adjusting plate B¹² secured to the shaft B¹³ and the adjustable ratchet cam-plate B¹⁴ keyed thereto, having the raised cam on its periphery to contact with the projecting heel o of the pawl and control its connection in various adjustments with the ratchet-wheel B⁸ and the cam-plate B¹⁵, attached to the frame A for raising the pawl out of action substantially as shown and described.

3. In a wire-stitching machine the wire-feeding device in combination with the oscillating adjustable journal-bearing b of the lower feed-roller B¹¹, the tapered projecting flange b' and its screw b^2 whereby the journal-bearing is oscillated to incline its upper surface and press the wire upon one edge and secure proper tension upon the wire substantially as shown and described.

4. In a wire-stitching machine, the staple-forming and staple-driving mechanism combined with the grooved knife e' and the forcing-die E that cuts a section of wire from between the portion which is to form the staple and the remaining portion of the strand, thereby providing square ends substantially as and for the purposes set forth.

5. In a wire-stitching machine the combination of the anvil F having the upwardly-inclined slot f and the vertically-grooved former G, having the holding notch or groove g^5 at its base to receive from the anvil the wire from which the staple is to be formed and hold it in proper position for entering the vertical grooves of the former G substantially as shown and described.

FREDERICK PETER ROSBACK.

Witnesses:

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F. P. ROSBACK, Jr.