

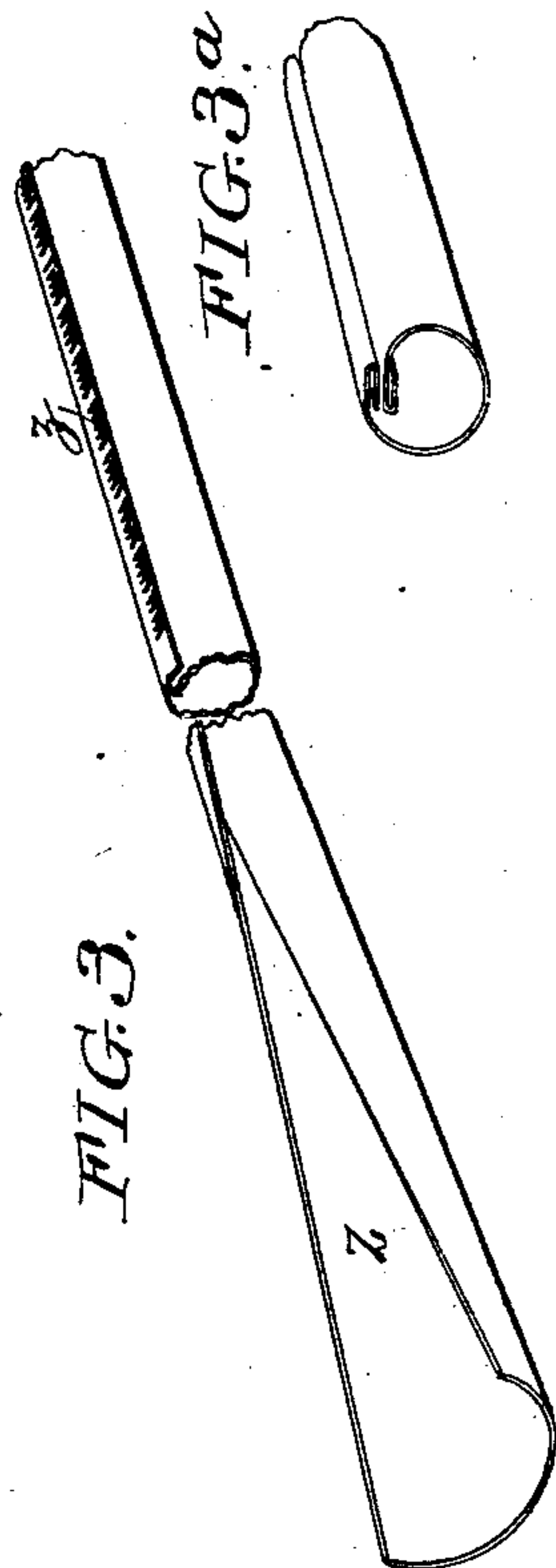
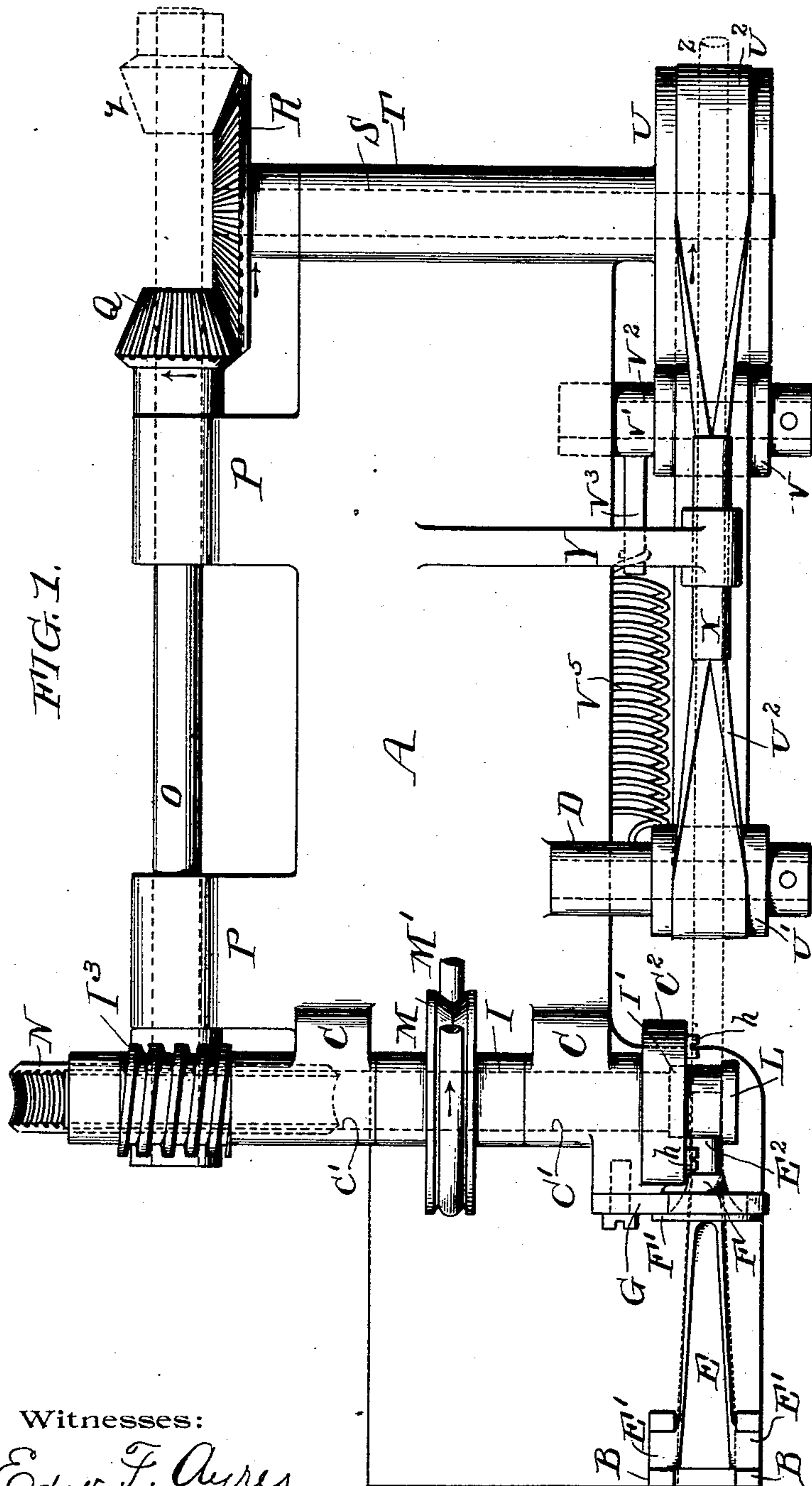
(No Model.)

3 Sheets—Sheet 1.

H. BILGRAM.  
CIGARETTE MACHINE.

No. 572,150.

Patented Dec. 1, 1896.



Witnesses:  
Edw. F. Ayres  
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Hugo Bilgram

Francis J. Chambers  
his Attorney.

(No Model.)

**3 Sheets—Sheet 2.**

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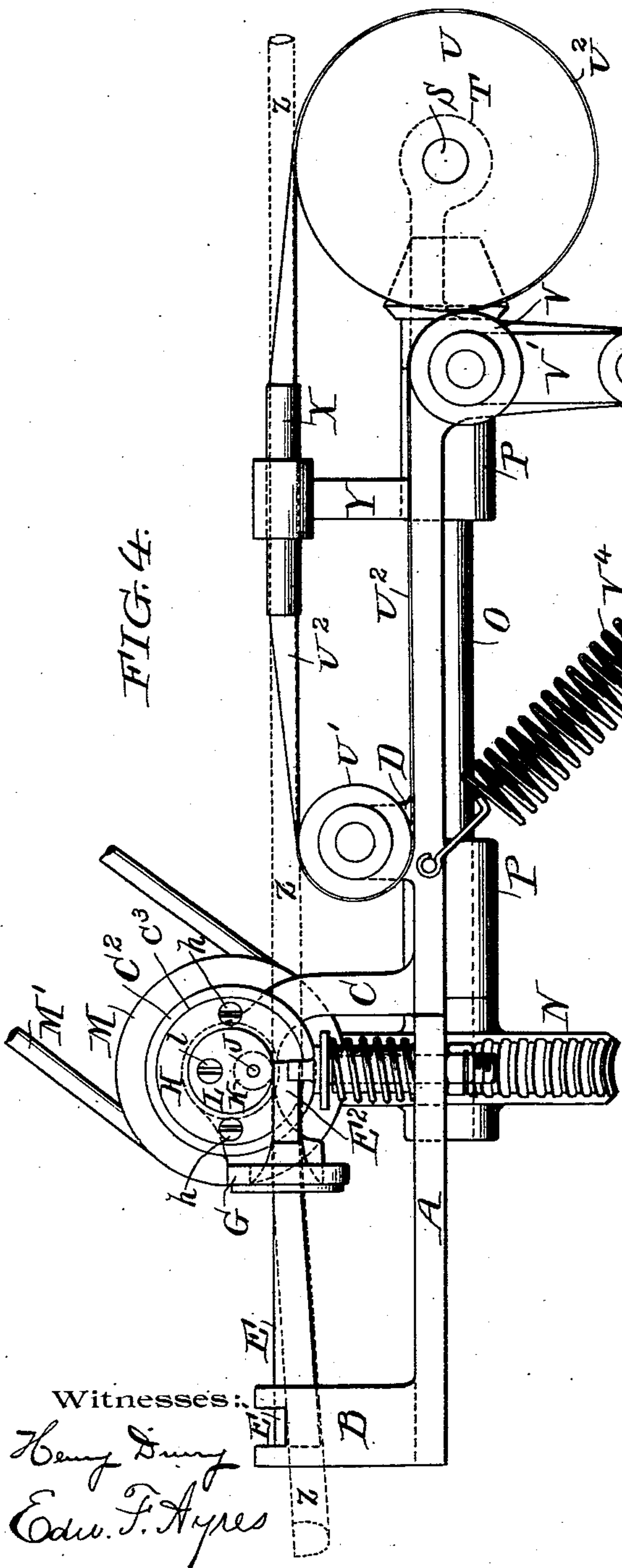


FIG. 4.

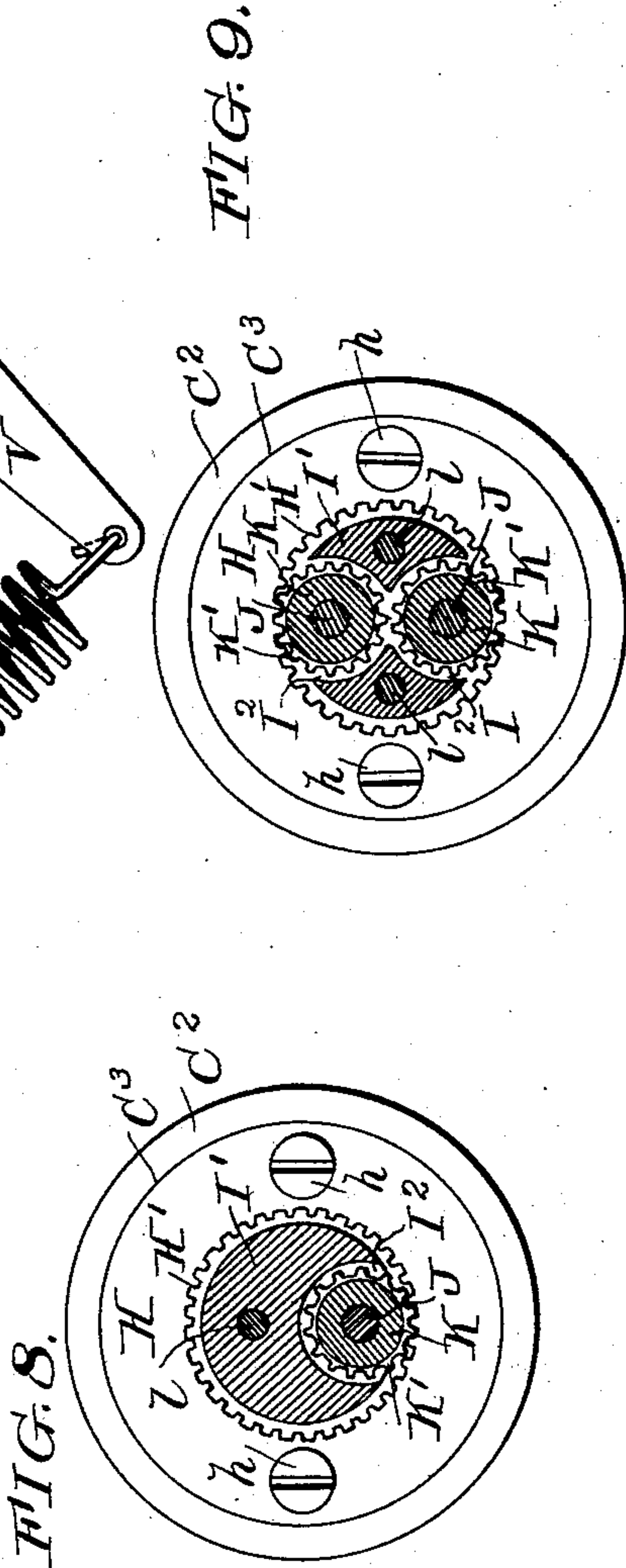


FIG. 8.

Fig. 9.

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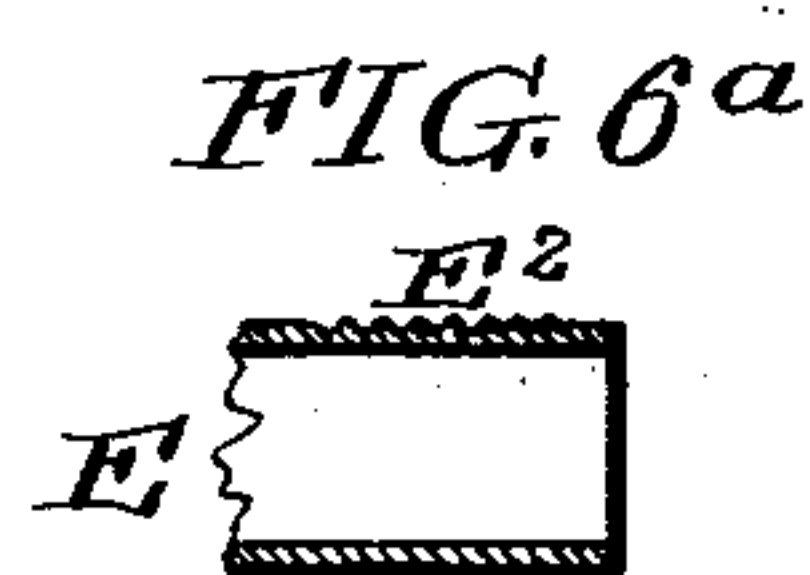
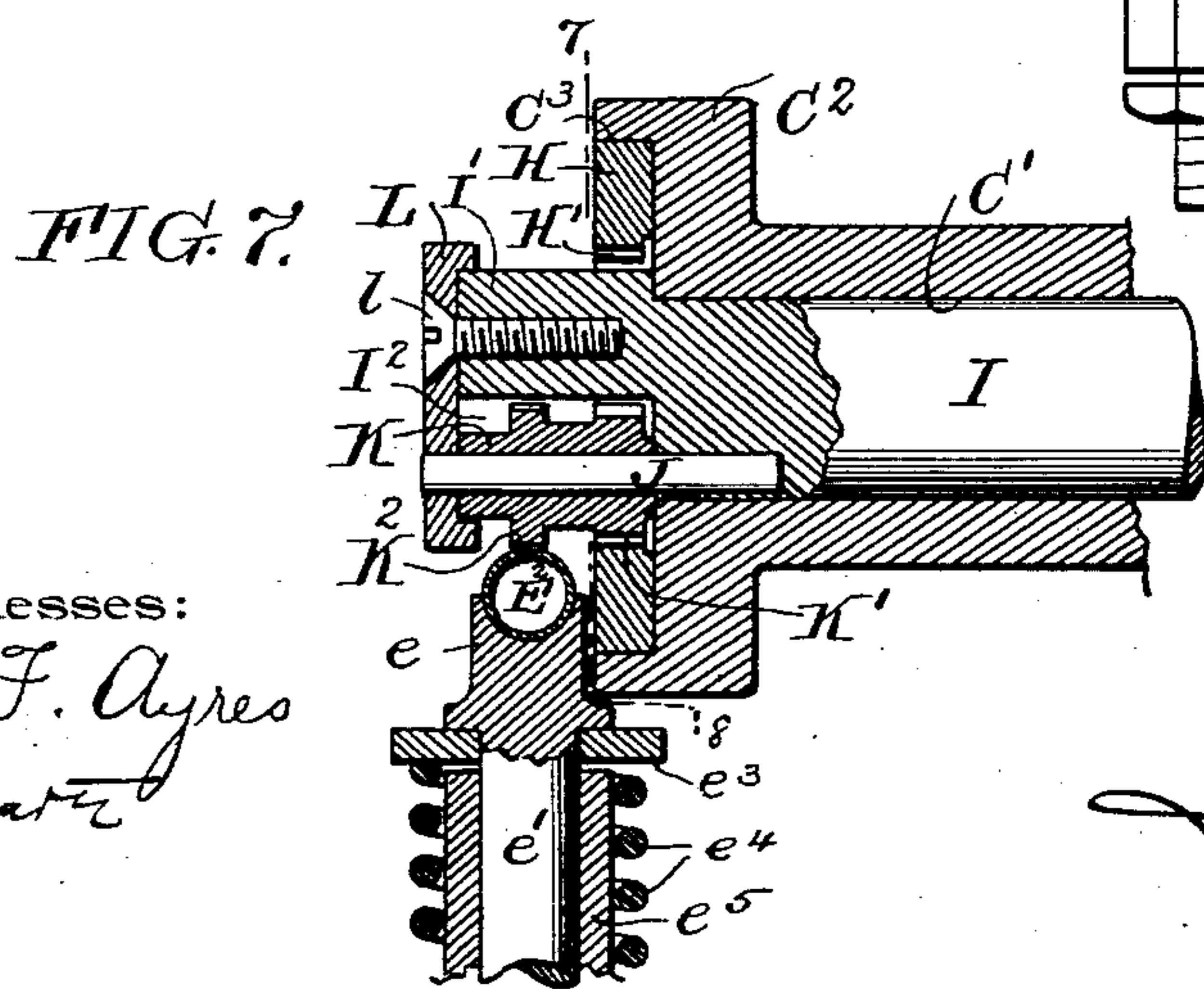
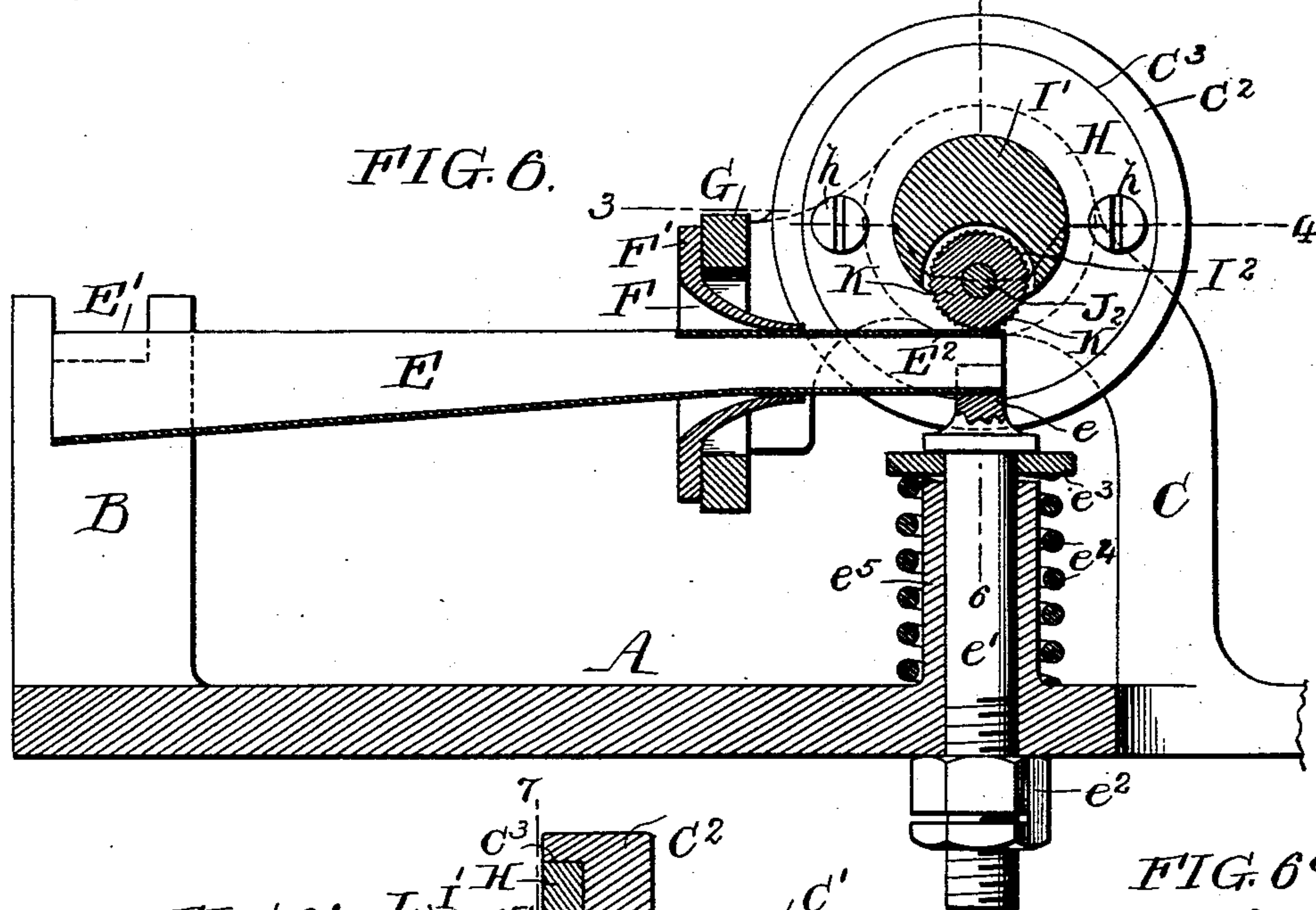
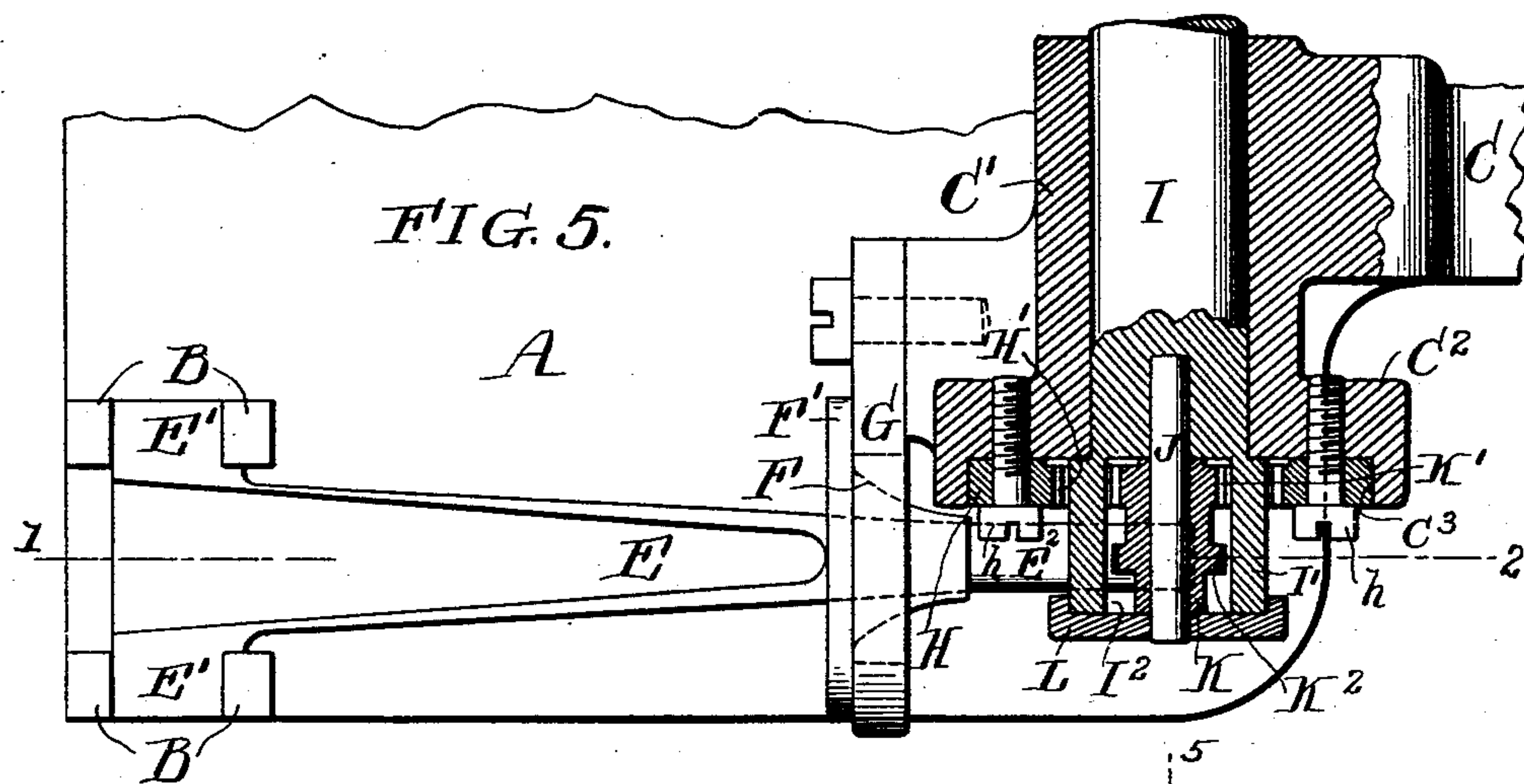
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Witnesses:

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# UNITED STATES PATENT OFFICE.

HUGO BILGRAM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE BONSACK MACHINE COMPANY, OF SALEM, VIRGINIA.

## CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 572,150, dated December 1, 1896.

Application filed December 9, 1893. Serial No. 493,222. (No model.)

*To all whom it may concern:*

Be it known that I, HUGO BILGRAM, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Improvement in Cigarette-Machines, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to a cigarette-machine, and particularly to that part of the machine in which a strip of paper is formed into a tube and has its lapping edges secured together, the object of my invention being to provide improved appliances for making what is known as a "crimped seam."

The nature of my improvements will be best understood as described in connection with the drawings, in which they are illustrated, and in which—

Figure 1 is a plan view of a part of a cigarette-machine embodying my improvement. Fig. 2 is an end view of the mandrel about which the paper tube is formed, shown on a somewhat enlarged scale, and Figs. 3 and 3<sup>a</sup> are views illustrating the mode in which the paper strip is formed into a tube. Fig. 4 is an elevation of the mechanism shown in Fig. 1. Fig. 5 is a horizontal section taken on the broken line 3 4 of Fig. 6. Fig. 6 is a vertical section taken on the line 1 2 of Fig. 5. Fig. 6<sup>a</sup> is a sectional view of the small end of the former. Fig. 7 is a vertical section taken on the line 5 6 of Fig. 6. Fig. 8 is a vertical section taken on the line 7 8 of Fig. 7, and Fig. 9 is a similar view illustrating a modification of the construction shown in Fig. 8.

A is the frame of the machine; B B, supports extending up from the frame and having crotches in their upper ends in which rest lugs E' E', extending out from each side of the mandrel E. This mandrel, as shown, is in conical form and hollow and is shown open at the top for the purpose of receiving the tobacco filler, which is fed through the center of the hollow mandrel while the paper is drawn around its outside. Its smaller end is cylindrical, as indicated at E<sup>2</sup>, and is preferably made with a few fine teeth, as shown

in Fig. 6<sup>a</sup>, to coact with the crimping-wheel hereinafter to be described.

C C are brackets extending up from the frame A and supporting bearings C' C', in which is supported a shaft I. This shaft is arranged above the mandrel, and, as shown, it is driven by means of a belt-wheel M and a belt M', which extends off to a source of power. (Not shown.) At the end of the shaft I which lies near or over the end E<sup>2</sup> of the mandrel I secure a crimping-wheel K<sup>2</sup>, said wheel being journaled eccentrically to the axis of the shaft I, as shown, to a pin J. The position of the crimping-wheel is such as to bring it immediately above the end E<sup>2</sup> of the mandrel, and the adjustment is such that the crimping-wheel will come in contact with the mandrel once in each revolution made about the axis of the shaft I. Preferably the crimping-wheel should be given an independent rotation about its own axis, and, as shown, the wheel K<sup>2</sup> is formed upon a drum K, from the face of which also extends a gear-wheel K', the teeth of which intermesh with a stationary internally-toothed gear-wheel H H'. This construction obviously results in the rapid rotation of the drum and crimping-wheel about its own axis while they are being carried around the axis of the shaft. The stationary gear-wheel H H' is preferably secured, as shown, to the end of the bearing C', or, rather, to an enlargement C<sup>2</sup> of the said bearing, having a cavity C<sup>3</sup> in which the plate H, having teeth H' and forming an internal gear-wheel, can be set and secured, as by screws h. I have in the drawings shown the end of the shaft I as enlarged at I' and provided with an eccentrically-disposed cavity I<sup>2</sup> of proper shape and dimensions to receive the drum K, the pin J being set into a hole drilled in the shaft and its outer end preferably secured, as indicated, to a plate L, secured to the end of the shaft, as by a screw l.

It is obvious that a considerable pressure must be exerted by the crimping-wheel against the end E<sup>2</sup> of the mandrel in order to effect such a crimping of the lapped edges of the paper strip as will form a permanent and secure seam. To secure the necessary pressure and at the same time avoid destruc-



tive strains to the mechanism, I make the contact of the crimping-wheel and mandrel of a yielding character preferably, as shown, by supporting the end  $E^2$  of the mandrel upon a bearing-block  $e$ , which is held normally at a determined height by spring-pressure, the said height being regulated by any convenient means. In the construction shown the block  $e$  is secured to the end of a pin  $e'$ , which extends down through a projecting thimble  $e^5$ , the lower end of the pin  $e'$  being threaded. A nut  $e^2$  is provided for regulating the exact height to which the bearing-block  $e$  can be raised. A spring  $e^4$  is placed around the thimble  $e^5$  and abuts against the shoulder or plate  $e^3$ , secured to the upper part of the pin  $e'$ . Obviously by this construction the bearing-block is held normally at a constantly-determined height and permitted to yield when the pressure of the crimping-wheel upon the mandrel exceeds the force of the spring  $e^4$ . As the mandrel  $E$  is intended to be made hollow, as shown, and when so constructed must have quite thin walls, care must be taken that the pressure between the block  $e$  and the crimping-wheel shall not press it out of shape, and I provide against this tendency by making the supporting-face of said block  $e$  of a curved form adapted to fit around the lower part of the mandrel and to support it against deforming strains.

$F$  indicates a conical ring, the function of which is to direct the strip of paper around the mandrel and effect the formation of a tube. The ring  $F$  rests upon the mandrel loosely and is kept in proper place by means of its flange  $F'$ , resting against a plate  $G$ , which, as shown, is secured to the bracket  $C$ .

The paper tube is drawn over the mandrel in any convenient way, but preferably, as shown, by means of a belt  $U^2$ , which is caused to take a circular form and grip the tube by passing through a tube  $X$ , supported by a bracket  $Y$ , extending up from the frame. The belt passes over drums or pulleys  $U$  or  $U'$ , and a proper tension is preserved by the action of a roller  $V$ , secured on one arm of lever  $V'$   $V^3$ , pivoted at  $V^2$ , the roller being pressed against the belt and the rim of the drum  $U$  by the action of spring  $V^4$ . The belt is driven by the mechanism shown in the drawings, to wit: a worm  $I^3$  on the end of the shaft  $I$  which engages a worm-wheel  $N$ , secured on the shaft  $Q$ , said shaft being supported in journals  $P$   $P$  and having at its other end a bevel gear-wheel  $Q$ , engaged with a bevel-gear  $R$ , the last-mentioned gear being attached to a shaft  $S$ , to which in turn is attached the pulley  $U$ . I may say that the shaft  $I$ , carrying the crimping-wheel, may rotate in either direction, but of course the belt must always move in the same direction. No essential change is needed, however, in the mechanism connecting the pulley  $U$  with the shaft  $I$ , as in case the direction of motion is changed it is only necessary to continue the shaft  $O$ , as indicated in dotted lines in Fig.

1, placing the miter-gear  $Q$  as indicated at  $q$ . In place of having but a single crimping-wheel two or even more, if desired, may be used, and in Fig. 9 I have illustrated a construction in which two drums  $K$  are secured to the end of the shaft  $I$  and come into play alternately as the shaft revolves.

It will of course be noticed that during the time the crimping-wheel is acting upon the paper the motion of the paper is interrupted, that is, it is held stationary between the end of the mandrel and the crimping-wheel. The time of action is so short, however, that though the mechanism moving the belt is continuously operating the elasticity of the belt and of the paper is sufficient to prevent rupture of the paper, and as soon as the crimping-wheel leaves contact with the paper the paper is again free to move forward, for it will be noticed that there is no pressure upon the mandrel except that of the crimping-wheel in its intermittent action.

As illustrated in Fig. 3, a plain strip of paper is shown formed into a tube by simply having its edges lapped. It is preferable, however, that the seam should consist of more than two thicknesses of paper, and it is sometimes desirable to fold the strip at the edges, as indicated in Fig. 3<sup>a</sup>, so as to form a seam of three or more plies of paper.

It is not necessary that the edges of the paper should hook into each other to form a joint or that they should be folded together into a joint or seam, for a seam, both airtight and durable, is formed by simply lapping the edges of the paper and then crimping the lapped edges, as indicated in Fig. 3. Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a rotating shaft, a crimping-wheel secured eccentrically to and rotating with the shaft, the normal position of the mandrel and crimping-wheel being such that they will come in contact at one point in the revolution of the shaft and wheel, and means for feeding a strip of paper over the mandrel.

2. In a cigarette-machine the combination with a mandrel, about which the paper is formed into a tube, of a rotating shaft, a crimping-wheel secured eccentrically to and rotating with the shaft, the normal position of the mandrel and crimping-wheel being such that they will come in contact at one point in the revolution of the shaft and wheel, and continuously-moving means for feeding a strip of paper over the mandrel.

3. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a rotating shaft, a crimping-wheel secured eccentrically to and rotating with the shaft, the normal position of the mandrel and crimping-wheel being such that they will come in contact at one point



in the revolution of the shaft and wheel, means for effecting a yielding contact between the mandrel and crimping-wheel, and means for feeding a strip of paper over the  
5 mandrel.

4. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a rotating shaft, a crimping-wheel secured eccentrically to and  
10 rotating with the shaft, the normal position of the mandrel and crimping-wheel being such that they will come in contact at one point in the revolution of the shaft, and a wheel, means for rotating the crimping-wheel on its  
15 own axis, and means for feeding a strip of paper over the mandrel.

5. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a rotating shaft, a  
20 crimping-wheel secured eccentrically to and rotating with the shaft, the normal position of the mandrel and the crimping-wheel being such that they will come in contact at one point in the revolution of the shaft and wheel, means for rotating the crimping-wheel on its  
25 own axis, means for effecting a yielding contact between the mandrel and crimping-wheel, and means for feeding a strip of paper over the mandrel.

30 6. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a rotating shaft, a crimping-wheel secured eccentrically to and rotating with the shaft, the normal position  
35 of the mandrel and crimping-wheel being such that they will come in contact at one point in the revolution of the shaft and wheel and a belt as  $U^2$  for drawing the filled tube forward and the paper over the mandrel.

40 7. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a bearing-block  $e$  arranged beneath and fitting around the end of the mandrel, a rotating shaft, a crimping-

wheel secured eccentrically to and rotating 45 with the shaft, said wheel being arranged above the bearing-block  $e$  as described, and means for feeding a strip of paper over the mandrel.

8. In a cigarette-machine the combination 50 with a mandrel about which the paper is formed into a tube, of a spring-supported bearing-block  $e$  arranged beneath the end of the mandrel and having means for adjusting its normal position, a rotating shaft, a crimp- 55 ing-wheel secured eccentrically to and rotating with the shaft, said wheel being arranged above the bearing-block  $e$  as described, and means for feeding a strip of paper over the mandrel. 60

9. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a spring-supported bearing-block  $e$  arranged beneath and fitting 65 around the end of the mandrel and having means for adjusting its normal position, a rotating shaft, a crimping-wheel secured eccentrically to and rotating with the shaft, said wheel being arranged above the bearing- 70 block  $e$  as described, and means for feeding a strip of paper over the mandrel.

10. In a cigarette-machine the combination with a mandrel about which the paper is formed into a tube, of a rotating shaft, a drum  $K$  journaled eccentrically to the end of 75 the shaft and having a spur-wheel  $K'$  and crimping-wheel  $K^2$  formed on its face, a stationary internally-toothed gear arranged to engage the gear  $K'$  and revolve the drum  $K$  on its axis as it revolves about the axis of 80 the shaft and means for feeding a strip of paper over the mandrel as and for the purpose described.

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Witnesses:

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