

(No Model.)

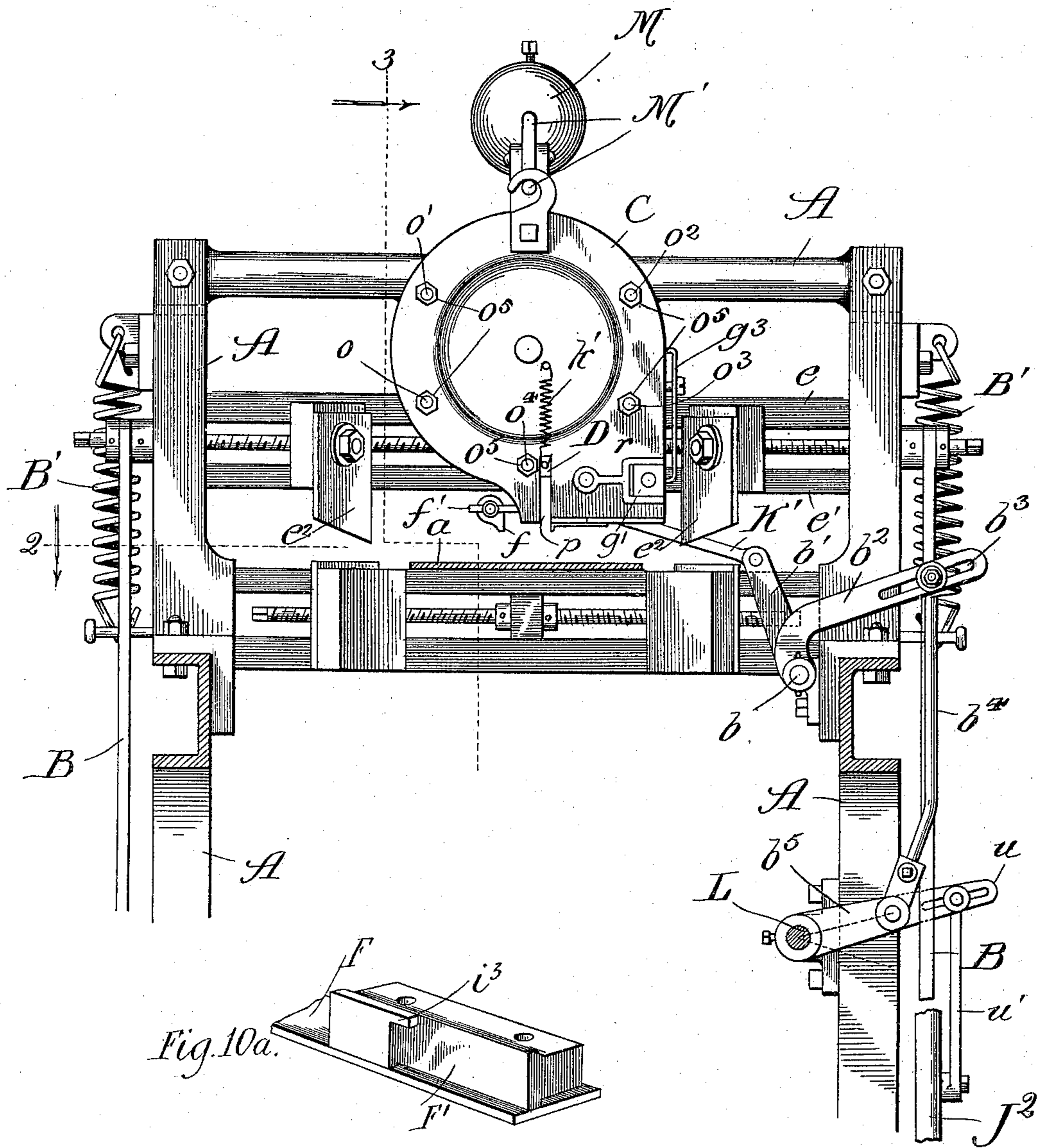
4 Sheets—Sheet 1.

F. P. HILL.  
BOOKBINDING MACHINE.

No. 604,170.

Patented May 17, 1898.

Fig. 1.



Witnesses:  
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(No Model.)

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Fig. 2.

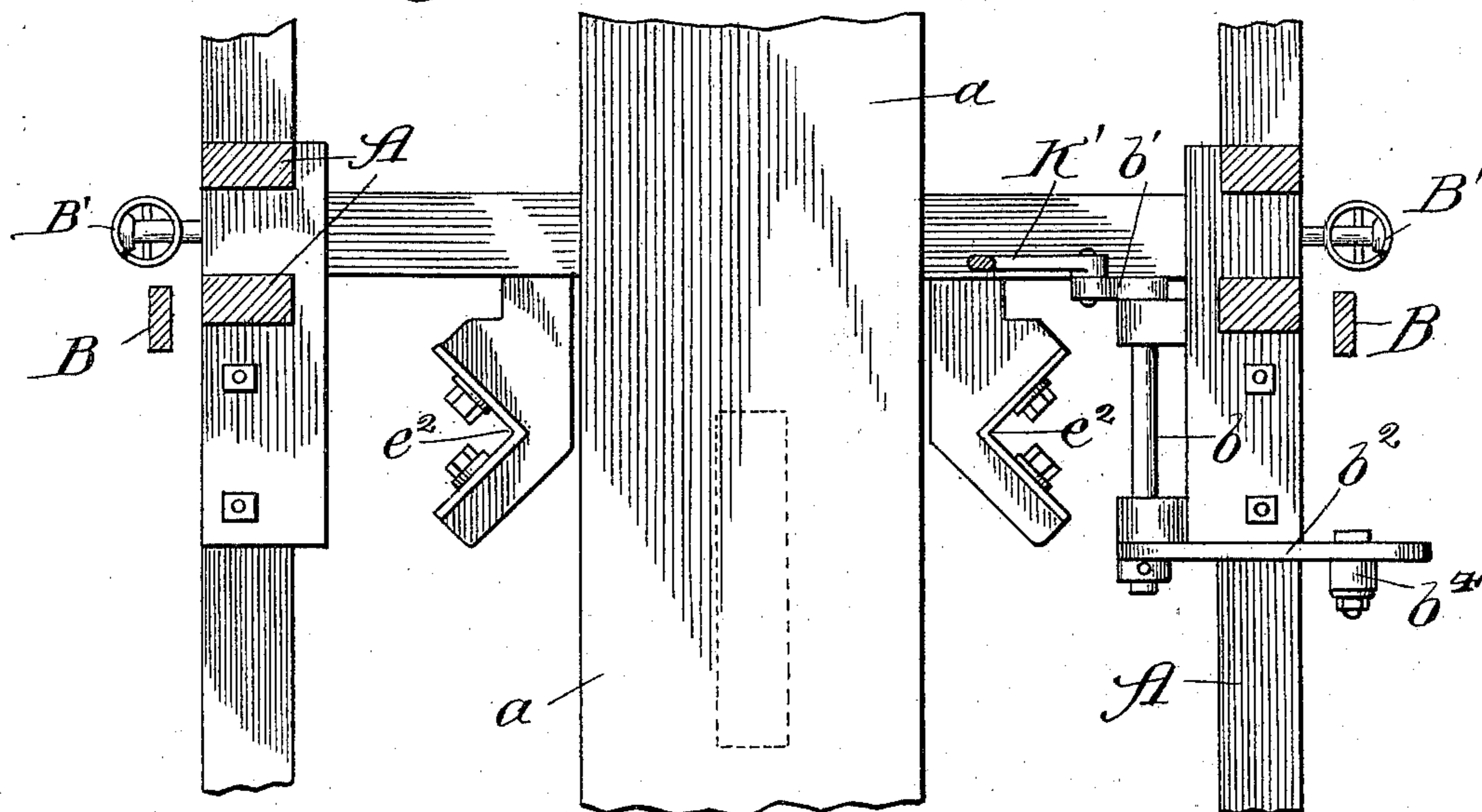
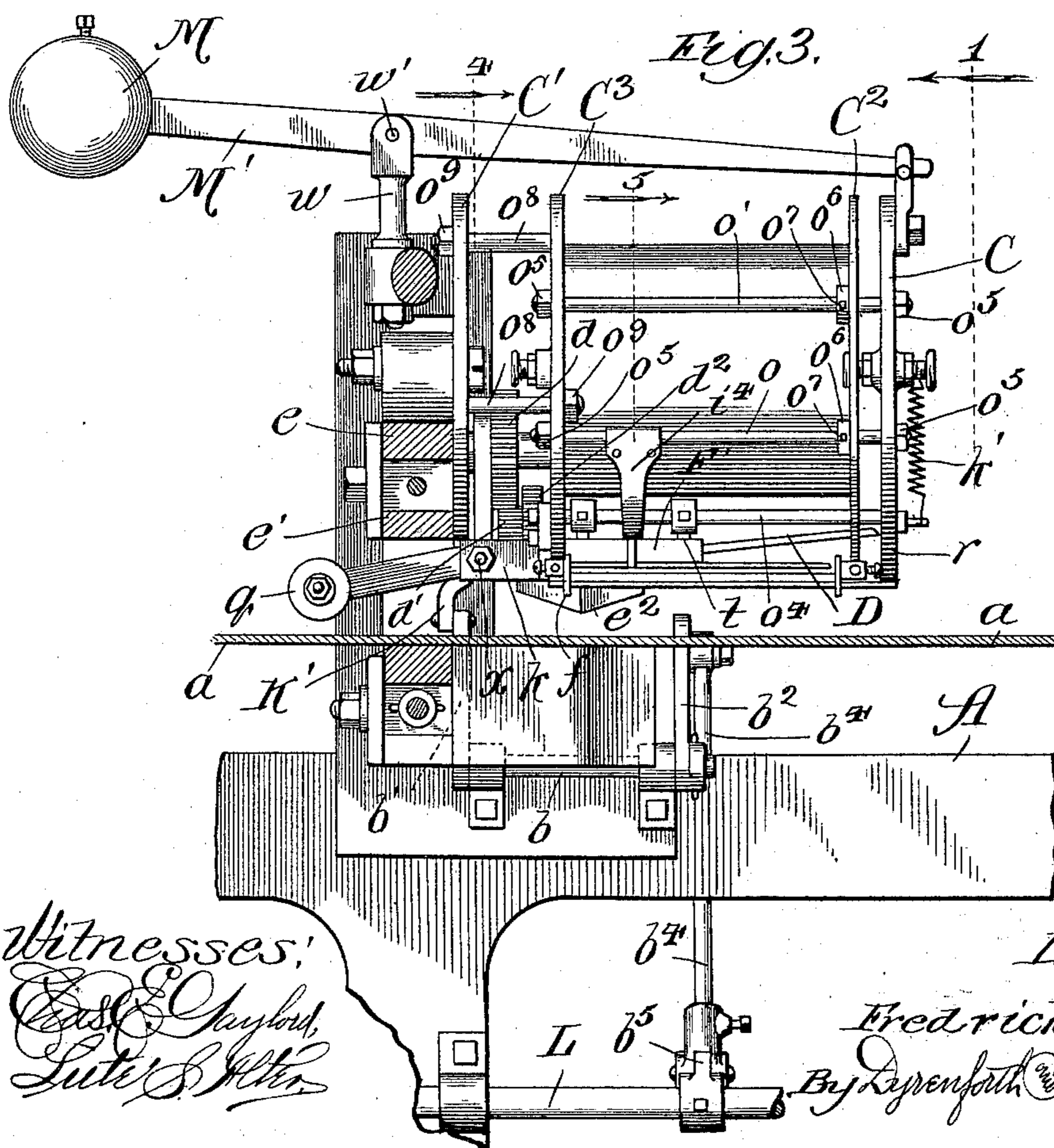


Fig. 3.



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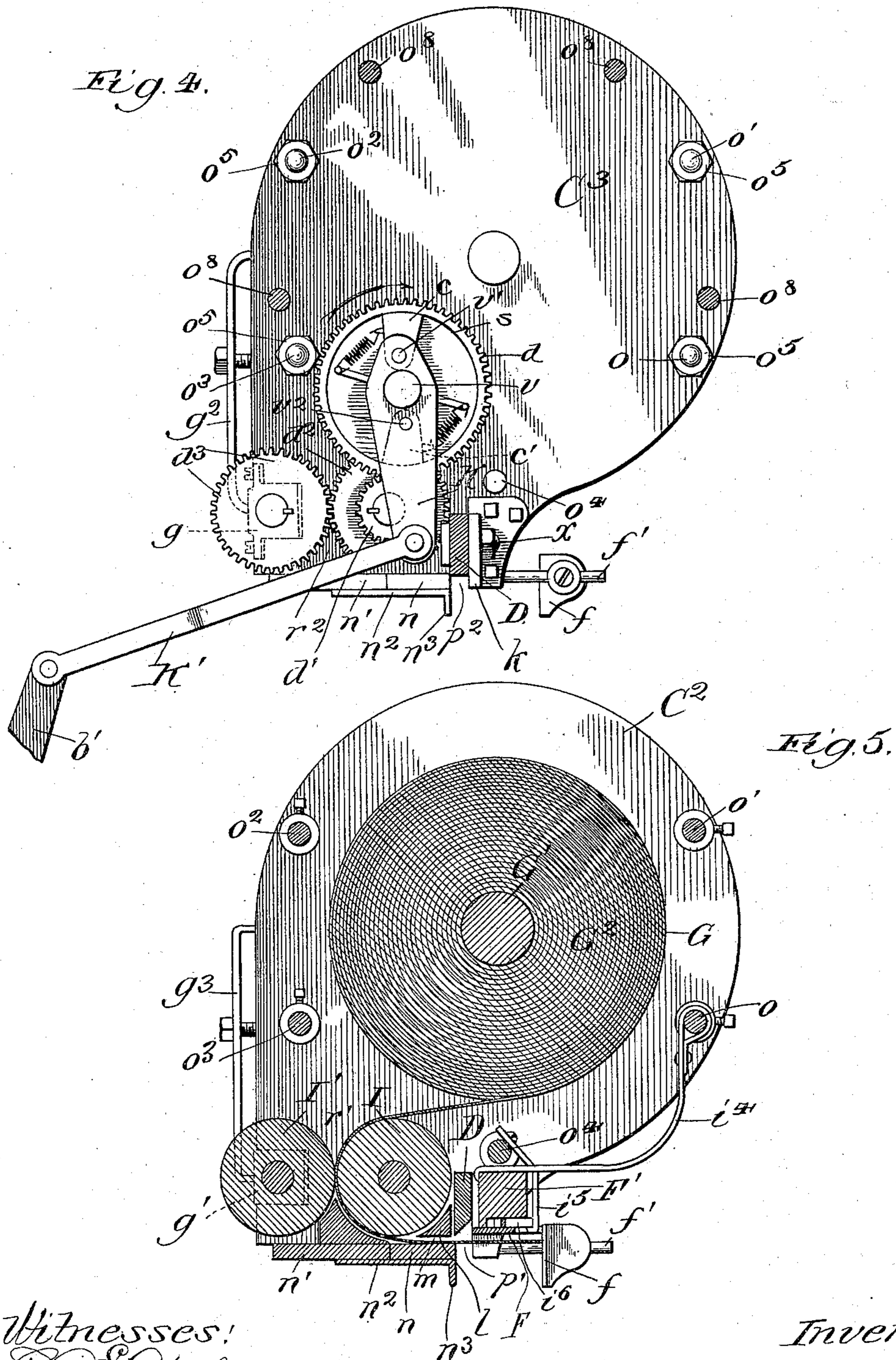
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(No Model.)

4 Sheets—Sheet 4.

F. P. HILL.  
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Patented May 17, 1898.

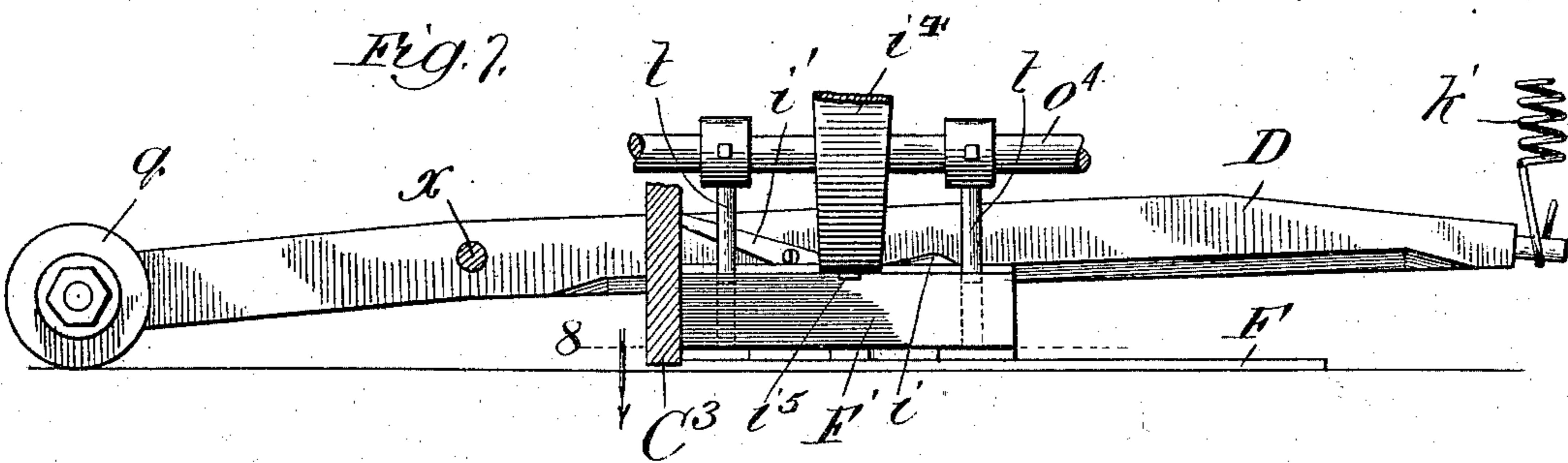
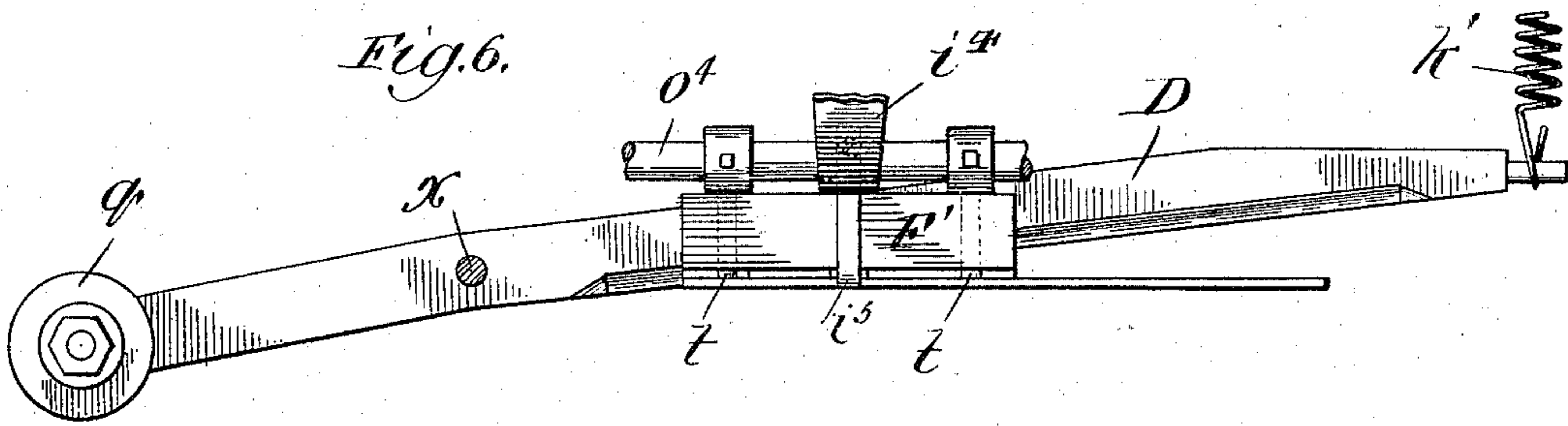
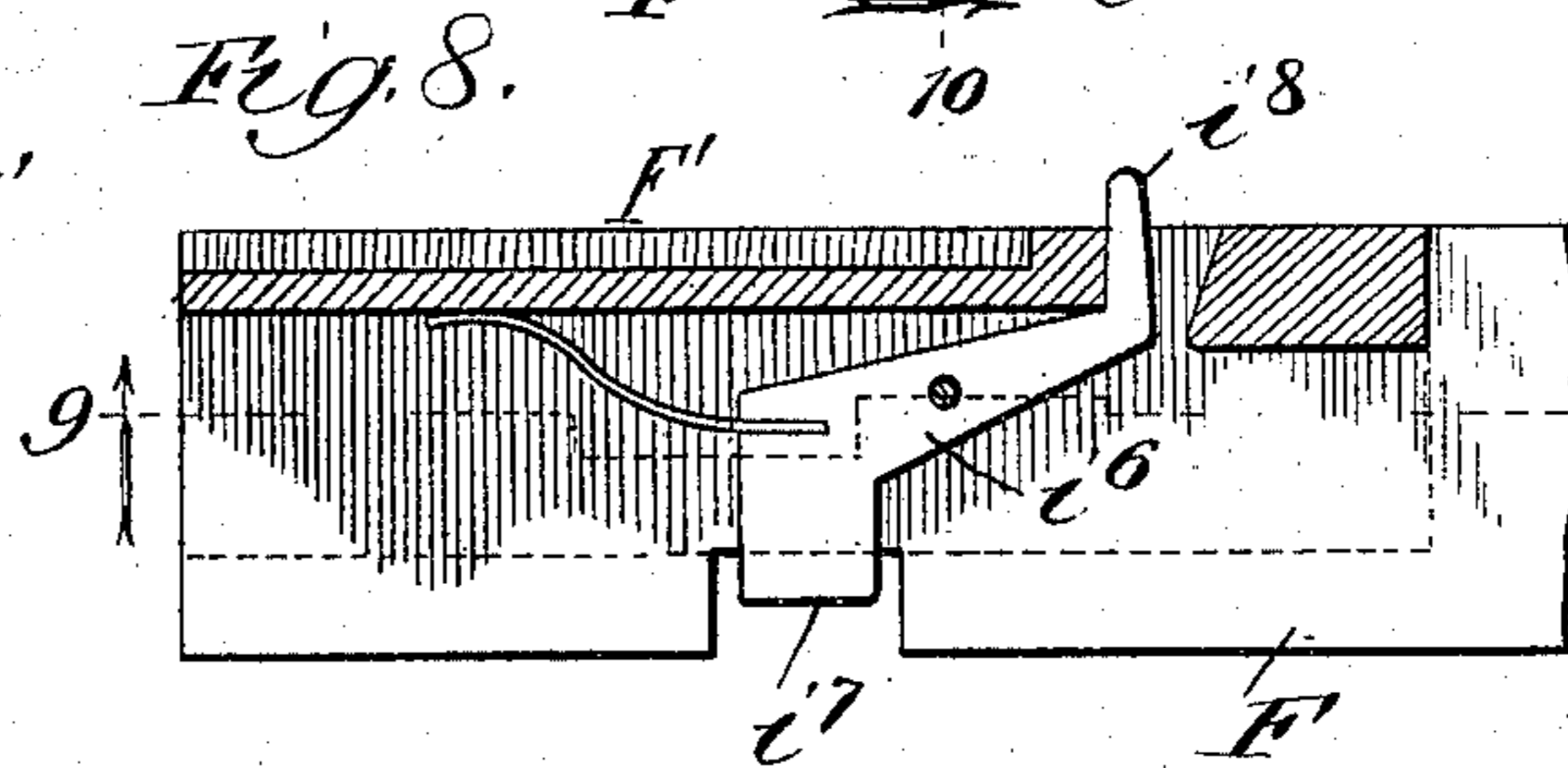
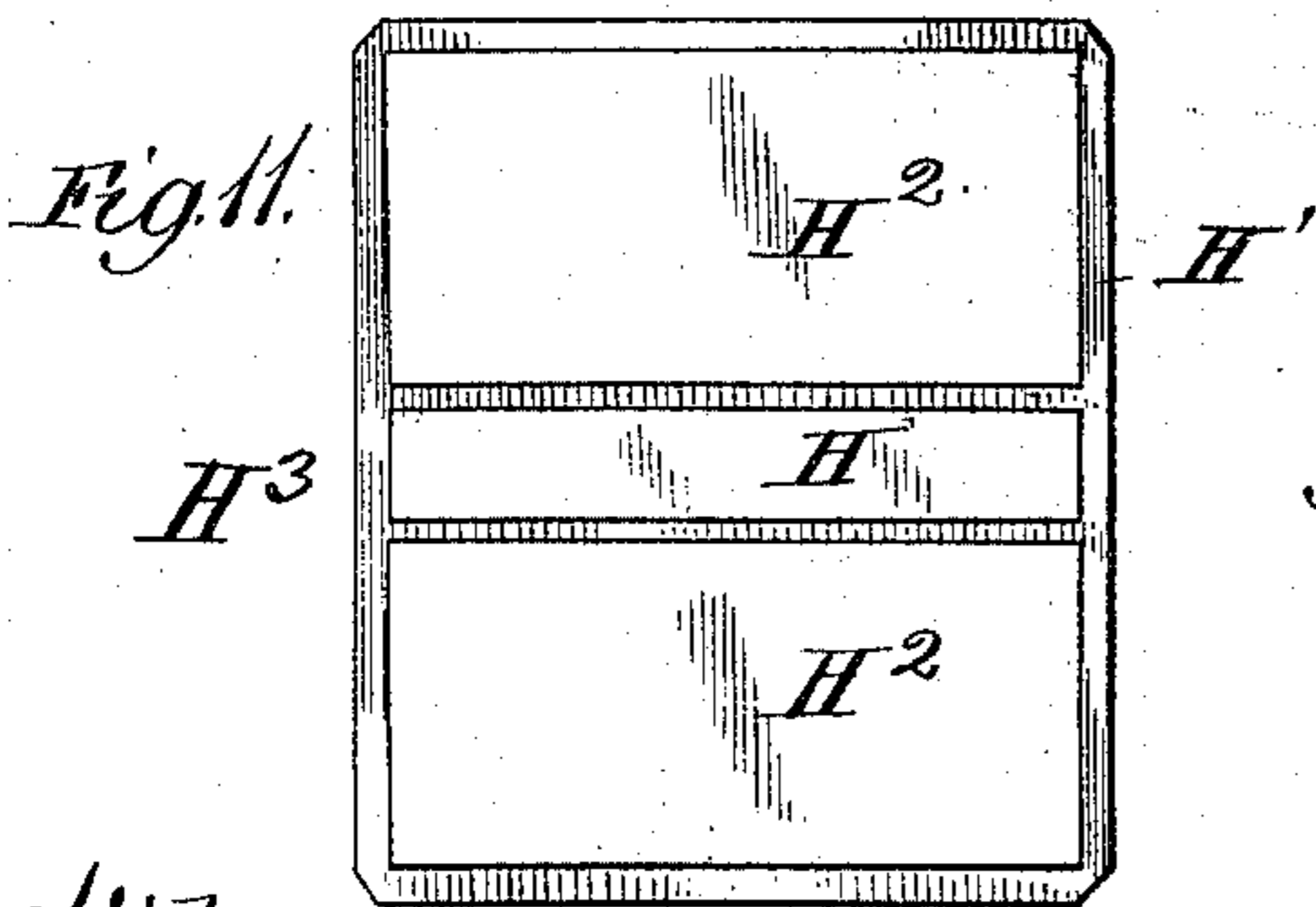
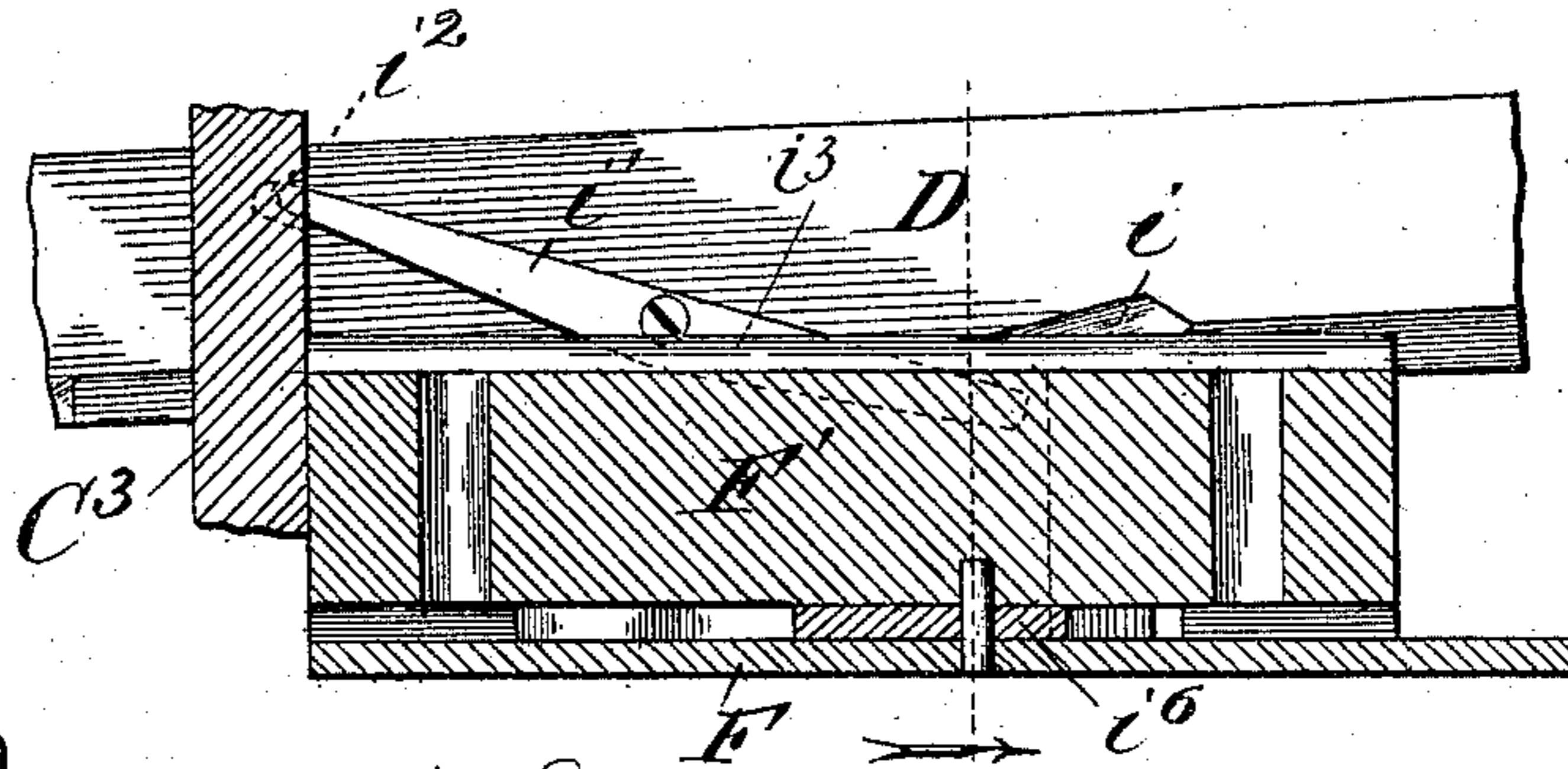
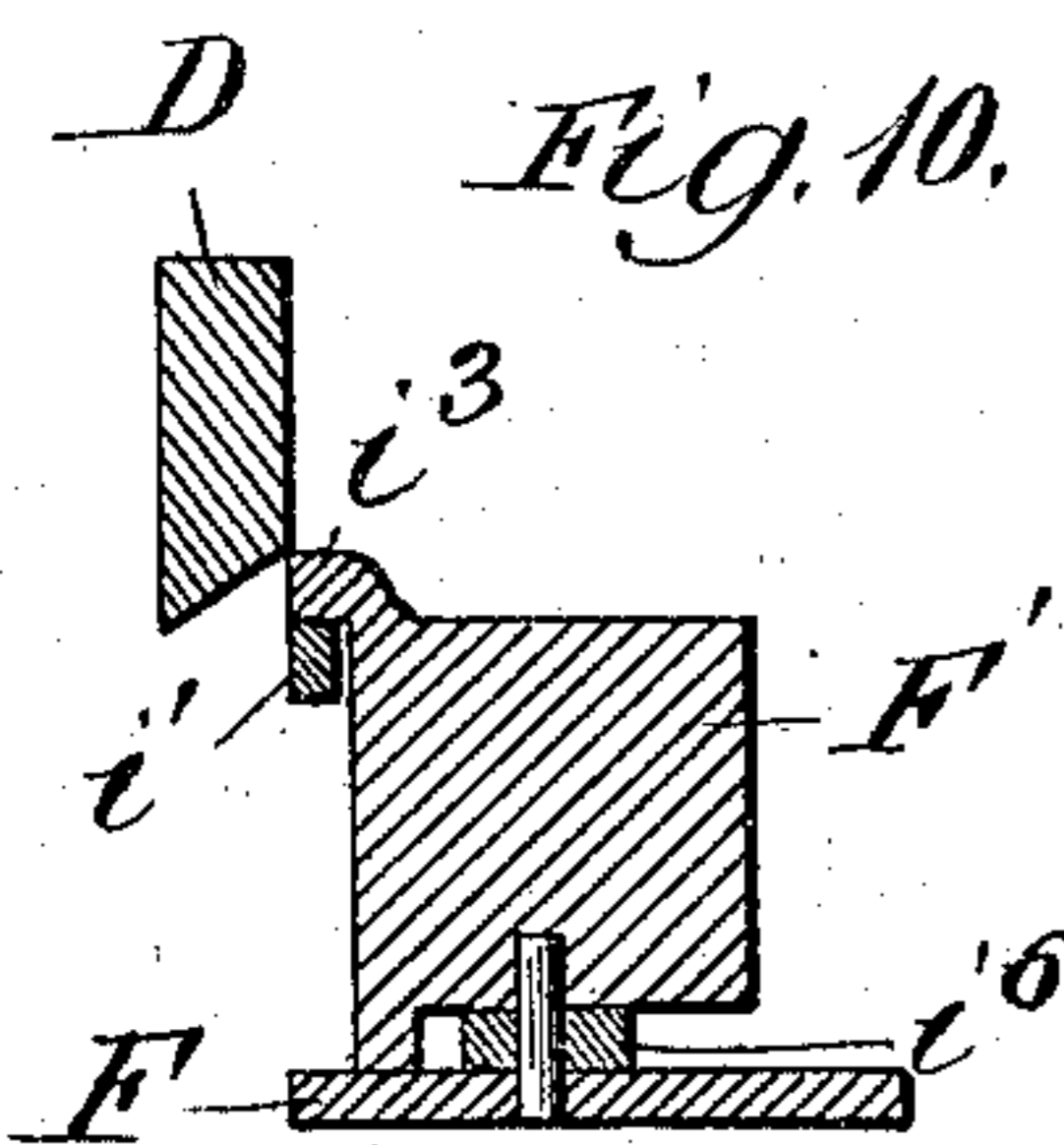


Fig. 9.



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# UNITED STATES PATENT OFFICE.

FREDRICK P. HILL, OF CHICAGO, ILLINOIS.

## BOOKBINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 604,170, dated May 17, 1898.

Application filed December 10, 1897. Serial No. 661,420. (No model.)

*To all whom it may concern:*

Be it known that I, FREDRICK P. HILL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Attachments for Book-Cover Machines, of which the following is a specification.

This invention relates to an attachment for use on machines operating to manufacture "book-cases," as they are known to the binders' trade, or "book-covers," as they are hereinafter termed; and it is especially designed for use on the machine for which Letters Patent of the United States No. 490,895 were granted January 31, 1893, to supplement that machine by coöperating therewith to cut and apply the lining-strips for the backs of the covers, being the strips of paper which it is customary to gum to the inner surfaces of the backs to reinforce the latter. Hitherto and in the use of the aforesaid machine it has been the practice to cut and apply these lining-strips by hand, though the machine is, according to the patent, equipped with an attachment for these operations, but of entirely different construction and mode of operation from that forming the subject of my present invention.

Inasmuch as all the parts of the machine for use with which my attachment is designed are shown and described in the aforesaid patent, there is no need of showing and describing in detail in the present connection more of the said machine than is necessary to enable the coöperation therewith of my improved attachment to be comprehended by those skilled in the art.

Generally stated, the operation of the aforesaid patented machine is as follows: The fabric to form the covering for the book-cover is fed in a web from a roll at the rear end of the machine, in passing from which it is pressed against a gumming-roll to coat one surface with cement. From the gumming device the web passes over suitable rollers, past mechanism operating to feed boards cut to proper size and contained in two piles, side by side, in a suitable magazine. This feeding mechanism delivers the boards two at a time, one from each pile, to the cemented side of the web in succession, suitably timed relatively

to the rate of feed of the web, in a manner to apply the pairs of boards against the web at proper intervals to leave the requisite space between the successive pairs to form the two overlapping flaps. The boards and fabric are pressed tightly together by passing them between pressure-rolls to cause the boards to adhere to the gummed surface. On reaching a suitable position a cutter is actuated to sever the web midway between two successive pairs of boards, and just before severing the web the corners of the projecting edges of the board-covering fabric are also cut off to the proper outline by providing V-shaped knives at the ends of the cutter. It is at this point in the operation of the machine that my improved attachment is caused to act to feed a web of paper from a roll thereof, cut from it a section of proper shape and size to form the lining for the back of the book-cover, and apply it firmly to that portion of the cement-coated surface of the web which extends between the two boards and forms the back. After the application of this lining-strip the advancing edge or flap of fabric is folded over by the action of a suitable folder, and after each cutting operation to sever from the web, with the superimposed boards, a section the rearward-projecting flap of the latter is turned forward and laid against the opposite end portions of the boards by another end-folder.

The final operation of the machine is performed by side-folders operating to fold over the lateral edges of the boards the projecting side flaps of the fabric, thereby causing them to adhere.

Referring to the accompanying drawings, Figure 1 is a cross-sectional view of the entire machine, showing my improved attachment in end elevation, the view being taken at the line 1 on Fig. 3 and regarded in the direction indicated by the arrow; Fig. 2, a section taken at the line 2 on Fig. 1 and viewed in the direction of the arrow; Fig. 3, a section taken at the line 3 on Fig. 1 and viewed in the direction of the arrow; Fig. 4, a section taken at the line 4 on Fig. 3 and viewed in the direction of the arrow; Fig. 5, a section taken at the line 5 on Fig. 3 and viewed in the direction of the arrow; Fig. 6, a broken sectional view taken through the attachment in front and lengthwise of the

cutter, showing it in raised position; Fig. 7, a similar view showing the cutter in its position just after operating; Fig. 8, a section taken at the line 8 on Fig. 7 and viewed in the direction of the arrow; Fig. 9, a section taken at the line 9 on Fig. 8 and viewed in the direction of the arrow; Fig. 10, a section taken at the line 10 on Fig. 9 and viewed in the direction of the arrow; Fig. 10<sup>a</sup>, a broken perspective view of the carrier and presser-plate; and Fig. 11, a plan view of one of the severed sections of the web of fabric, with the boards and lining-strip thereon and before the projecting flaps have been folded down.

A is the frame of the machine, near the longitudinal center of which is the transverse cutter-head *e*, shown in the patent referred to and described therein by the reference-letter E, and carrying the blade *e'* and the V-shaped knives *e''* near its opposite ends. This head is supported in the frame to be lowered at the proper time through the medium of the springs B' B' and raised by the rods B B after the cutters have operated to sever the web and cut the corners of the flaps, as hereinbefore stated.

On the cutter-head *e* my improved attachment is supported to extend at a right angle therewith along the longitudinal center of the machine and to move with the head. This attachment involves the following-described construction:

C and C' are the outer heads, forming the front and rear ends of the attachment, and preferably of the general disk shape shown, with the lower angular extension *r* on the forward head containing the slot *p*, extending vertically upward from its lower edge.

C<sup>2</sup> and C<sup>3</sup> are the inner heads, generally shaped like the head C, with the slots *p'* and *p''*, respectively, in their extensions *r'* and *r''* and coinciding with the slot *p*. The heads C, C<sup>2</sup>, and C<sup>3</sup> are spaced and rigidly held apart by rods *o*, *o'*, *o''*, *o'''*, and *o''''*, passing through them at intervals near their perimeters and fastened by nuts *o<sup>5</sup>* at their opposite projecting ends and by collars *o<sup>6</sup>* and set-screws *o<sup>7</sup>*, adjacent to the inner side of the head C<sup>2</sup>. The head C' is spaced and rigidly held apart from the head C<sup>3</sup> by rods *o<sup>8</sup>*, fastened by nuts *o<sup>9</sup>*, alternating at their outer and inner projecting ends.

Extending lengthwise of the attachment from the straight lower edge of the head C to that of the head C<sup>3</sup> at one side of the slots *p* *p'* *p''* and fastened to said edges is the plate *n*, affording a stationary cutter edge and backed by a plate *n'*, and fastened to the bottom of these plates is the shorter gage-plate *n''*, having the downward-extending lip *n'''* along its inner edge. Above the plate *n* and supported to leave the paper-feed space *m* below it, Fig. 5, is the guide-shoe *l* for the lining-paper.

D is the movable cutter-blade, pivotally supported at *x* at its handle end (on the ex-

tremity of which it carries the rollers *q* *q'* on a bearing *k*, projecting from the outer side of the head C<sup>3</sup>. This knife extends through the slots *p* *p'* *p''* and is controlled at its free end by a spring *k'*, the recoil of which tends to raise it, and the cutting edge coöperates, for a purpose hereinafter described, with the stationary cutter edge on the plate *n*. A cam-recess *i*, Figs. 7 and 9, is formed in a side of the blade of the knife D above its cutting edge, and on the same side of the knife-blade, adjacent to the cam-recess, is pivoted between its ends a finger *i'* to engage at one extremity with a recess *i''* in the inner side of the head C<sup>3</sup> next to its slot *p''*.

From the rod *o<sup>4</sup>* there depend parallel stems *t* *t'*, on which is reciprocally confined a presser-plate carrier F', having a flange *i<sup>3</sup>* extending part way along its rear upper edge. A spring *i<sup>4</sup>* depends from the rod *o* and is bifurcated at its lower end, where it bears against the top of the carrier F', to straddle a spring-catch *i<sup>5</sup>*, extending from the rod *o<sup>4</sup>*. An approximately Z-shaped spring-dog *i<sup>6</sup>* is pivoted between its ends to the lower side of the carrier F' to be engaged at one extremity *i<sup>7</sup>* by the catch *i<sup>5</sup>* and the other extremity *i<sup>8</sup>* projecting into the path of the cam-recess *i* in the blade of the knife D. On its base the carrier F' supports rigidly a presser-plate F.

As will hereinafter more fully appear, when the cutter-blade D is lowered on its pivot *x* against the resistance of the spring *k'* the cam-recess *i* engages the end *i<sup>8</sup>* of the spring-dog *i<sup>6</sup>*, thereby tripping the latter to disengage its end *i<sup>7</sup>* from the spring-catch *i<sup>5</sup>* and free the spring *i<sup>4</sup>* to permit it to force down the carrier F' and presser-plate F. When the knife-blade is freed, it is raised by the recoil of its controlling-spring *k'*, and in rising it turns the finger *i'* upward toward one end, owing to the confinement of its other end in the recess *i''* against the flange *i<sup>3</sup>* of the carrier F', thereby also raising the latter and engaging the end *i<sup>7</sup>* of the dog *i<sup>6</sup>* with the catch *i<sup>5</sup>* to hold the presser-plate carrier until the descent of the knife-blade shall again trip the dog *i<sup>6</sup>*.

Between the heads C<sup>2</sup> and C<sup>3</sup> at their centers is journaled a shaft G' for carrying on a roller G<sup>2</sup> the roll of paper G, affording the supply from which to cut the lining-strips H, Fig. 11. The free end of this web is passed about a feed-roller I, journaled in the extensions *r* *r''* of the heads C and C<sup>3</sup>. With this roller I there coöperates a companion roller I', journaled at its opposite ends in boxes, (indicated at *g* and *g'*, respectively, in Figs. 4 and 5,) supported in recesses formed in the heads C<sup>2</sup> and C<sup>3</sup> and yieldingly held to maintain accordingly the roller I' against the roller I by springs *g<sup>2</sup>* and *g<sup>3</sup>*. The web G is fed against stops *f* *f'*, adjustably supported on posts *f'f'*, extending from the heads C<sup>2</sup> and C<sup>3</sup>.

In the space between the heads C<sup>3</sup> and C' are housed the gears. (Shown most clearly in Fig 4.) Of these the larger gear *d* is jour-

naled on a stud  $v$ , projecting from the rear surface of the head  $C^3$ , and the rear surface of this gear is recessed circumferentially to afford a rim  $s$ , against the inner surface of which, at opposite points, bear spring-controlled friction-pawls  $c$  and  $c'$ , Fig. 4. These pawls are pivoted at  $v'$  and  $v^2$  to a lever  $K$ , fulcrumed between its ends on the stud  $v$  and connected by a link  $K'$  with a rock-shaft  $b$  on the frame of the machine through the medium of an arm  $b'$ . From the rock-shaft  $b'$  extends the arm  $b^2$ , containing the slot  $b^3$ , from which the arm is adjustably connected by a link  $b^4$  with an arm  $b^5$ , extending from the rock-shaft  $L$ , which is actuated at proper intervals by suitable connections  $u u'$  with a rod  $J^2$  of said patented machine and which is denoted in the aforesaid patent by the same reference-letter. The gear  $d$  meshes with a pinion  $d'$  on the end of the roller  $I$ , which carries also a gear  $d^2$ , meshing with a similar gear  $d^3$  on the adjacent end of the roller  $I'$ .

The head  $C^2$  is adjustable toward and from the head  $C$  to adapt it to afford bearings for rollers of different lengths.

The weight  $M$ , shown on a lever  $M'$ , extending backward from the front end of my improved attachment and fulcrumed at  $w'$  on a post  $w$ , extending upward from the frame of the machine, merely serves the purpose of assisting in holding up the attachment to reduce the strain of its support on the cutter-head  $e$ .

The operation is as follows: When the cutter-head  $e$  descends to sever the board-carrying web of fabric, which is fed along the bed-plate  $a$  of the machine, all as set forth in the said patent, the lining-applying attachment descends bodily with it. The rollers  $q$  on the handle portion of the cutter  $D$  contact with the web, which is then at rest, on the bed  $a$  and turn the blade downward on the pivot  $x$  to cause it to cut a strip  $H$  from the web of paper  $G$ , which has previously been fed across its path up to the stops  $f$  in the manner hereinafter described in the rise of the attachment with the head  $e$  after the previous operation. In the descent of the knife  $D$  its cam-recess  $i$  engages the dog  $i^6$  at its end  $i^8$  to disengage its end  $i^7$  from the catch  $i^5$  and free the spring  $i^4$ , normally held by the catch, through the medium of the carrier  $F'$ , from exerting its recoil force against the carrier  $F'$  to depress the latter and force the presser-plate  $F$  down against the severed strip  $H$ , to firmly apply it to the cemented surface of the section of fabric  $H'$  between the boards  $H^2$ , and thus line the back of the book-cover  $H^3$ . In the rise of the attachment by that of the cutter-head  $e$  the spring  $k'$  raises the cutter-blade  $D$ , thereby turning the finger  $i'$  to raise also the carrier  $F'$  and reproduce setting of the spring  $i^4$  by the pressure against it of the carrier in rising and engagement with the catch  $i^5$  of the end  $i^7$  of the spring-dog  $i^6$ , then freed at its end  $i^8$  from the cam-recess  $i$ . After the attachment has come to rest in its

raised position the rock-shaft  $L$  is turned to depress the arm  $b^5$  to the position thereof indicated by dotted lines in Fig. 1, thereby turning the lever  $K$  in the direction to engage the pawls  $v v'$  and the gear  $d$  and turn the rollers  $I$  and  $I'$  to feed the desired length of paper from the roll  $G$  thereof to be subsequently cut in the manner already described into a lining-strip  $H$  and applied to the back of the book-cover.

What I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a book-cover machine of the character set forth, an attachment adapted to be supported on the reciprocating cutter-head  $e$  of said machine, for cutting and applying the lining  $H$ , said attachment comprising a roll for the web of material for said lining, feed mechanism for feeding at intervals material from said roll, a cutter device operated by the descent of said cutter-head to sever from said web the fed section thereof forming a lining-strip, and a spring-actuated presser-plate released by the action of said cutter device to apply said strip, substantially as described.

2. In combination with a book-cover machine of the character set forth, an attachment, supported on the reciprocating cutter-head  $e$  of said machine, for cutting and applying the lining  $H$ , said attachment comprising a roll for the web of material for said lining, feed mechanism for feeding at intervals material from said roll, a cutter device comprising a spring-controlled pivotally-supported blade having a handle to bear against the bed of the machine in the descent of said cutter-head and thereby actuate the blade to sever from said web the fed section thereof forming a lining-strip, and a spring-actuated presser-plate operating to apply said strip, substantially as described.

3. In combination with a book-cover machine of the character described, an attachment, supported on the reciprocating cutter-head  $e$  of said machine, for cutting and applying the lining  $H$ , said attachment comprising a roll for the web of material, a cutter device having a spring-controlled pivotal blade actuated by the descent of said cutter-head to sever from said web the fed section thereof forming a lining-strip, and a presser-plate on a spring-pressed reciprocating carrier carrying a spring-dog to engage a catch and projecting into the path of said blade to be tripped thereby, substantially as described.

4. In combination with a book-cover machine of the character described, an attachment, supported on the reciprocating cutter-head  $e$  of said machine, for cutting and applying the lining  $H$ , said attachment comprising a roll for the web of material for said lining, feed mechanism for feeding at intervals material from said roll, a cutter device having a spring-controlled pivotal blade ac-

tuated by the descent of said cutter-head to sever from said web the fed section thereof forming a lining-strip, a cam on said blade and a pivotal finger thereon engaging at one end with the attachment-frame, and a presser-plate on a spring-pressed reciprocating carrier engaged by the free end of said finger and carrying a spring-dog projecting at one end into the path of said cam and engaging at its opposite end with a catch, substantially as described.

5. In combination with a book-cover machine of the character described, an attachment, supported on the reciprocating cutter-head *e* of said machine, for cutting and applying the lining *H*, said attachment comprising heads between which are supported a roll for the web of material for said lining and feed-rolls for said web, a cutter device having a pivotal spring-controlled blade provided with a handle to engage with the bed of said machine and carrying a pivotal finger engaging at one end with one of said heads and containing a cam-recess, a presser-plate on a spring-pressed reciprocating carrier engaged by the free end of said finger and carrying a spring-dog projecting at one end into the path of said cam-recess and engaging at its opposite end with a catch, and means for actuating said feed-rolls, substantially as described.

6. An attachment for a book-cover machine for cutting and applying the lining *H*, comprising, in combination heads connected together at intervals by rods and provided with recesses extending upward from their lower edges, a roll for the material *G*, and feed-rolls *I* and *I'* supported between said heads, a cutter *D* pivotally supported near one end to ex-

tend through said slots and connected with a spring *k'* at its free end and having a handle portion provided with a roller *q*, a finger *i'* pivoted on the cutter-blade and engaging at one end with a head, a cam-recess *i* in the blade, a carrier *F'* supporting a presser-plate *F* and reciprocally supported on one of said rods and having a flange *i<sup>3</sup>* engaged by the opposite end of said finger and carrying a spring-dog *i<sup>6</sup>*, a spring *i<sup>4</sup>* engaging the carrier *F'*, a catch *i<sup>5</sup>* engaging said dog, and a stationary cutter *n*, substantially as described.

7. In combination with a book-cover machine of the character described, an attachment supported on the reciprocating cutter-head *e* of said machine, for cutting and applying the lining *H*, said attachment comprising heads *C C' C<sup>2</sup>* and *C<sup>3</sup>* connected at intervals by rods, a roll for the material *G* and feed-rolls *I* and *I'* supported between said heads, a gear *d* on a stud *v* on the head *C<sup>3</sup>* meshing with a pinion *d'* on the roll *I*, and a gear *d<sup>2</sup>* on said roll meshing with a gear *d<sup>3</sup>* on the roll *I'*, a lever *K* fulcrumed on said stud and carrying the spring-pawls *v'* and *v<sup>2</sup>* engaging with said gear *d*, said lever being connected with the rock-shaft *L* of the machine, stops *f f*, a cutter *D* comprising a spring-controlled pivotally-supported blade having a handle to bear against the bed of the machine in the descent of said cutter-head, and a presser-plate *F* on a spring-pressed carrier *F'* actuated by said blade, the whole being constructed and arranged to operate substantially as described.

FREDRICK P. HILL.

In presence of—

J. H. LEE,

R. T. SPENCER.