

(No Model.)

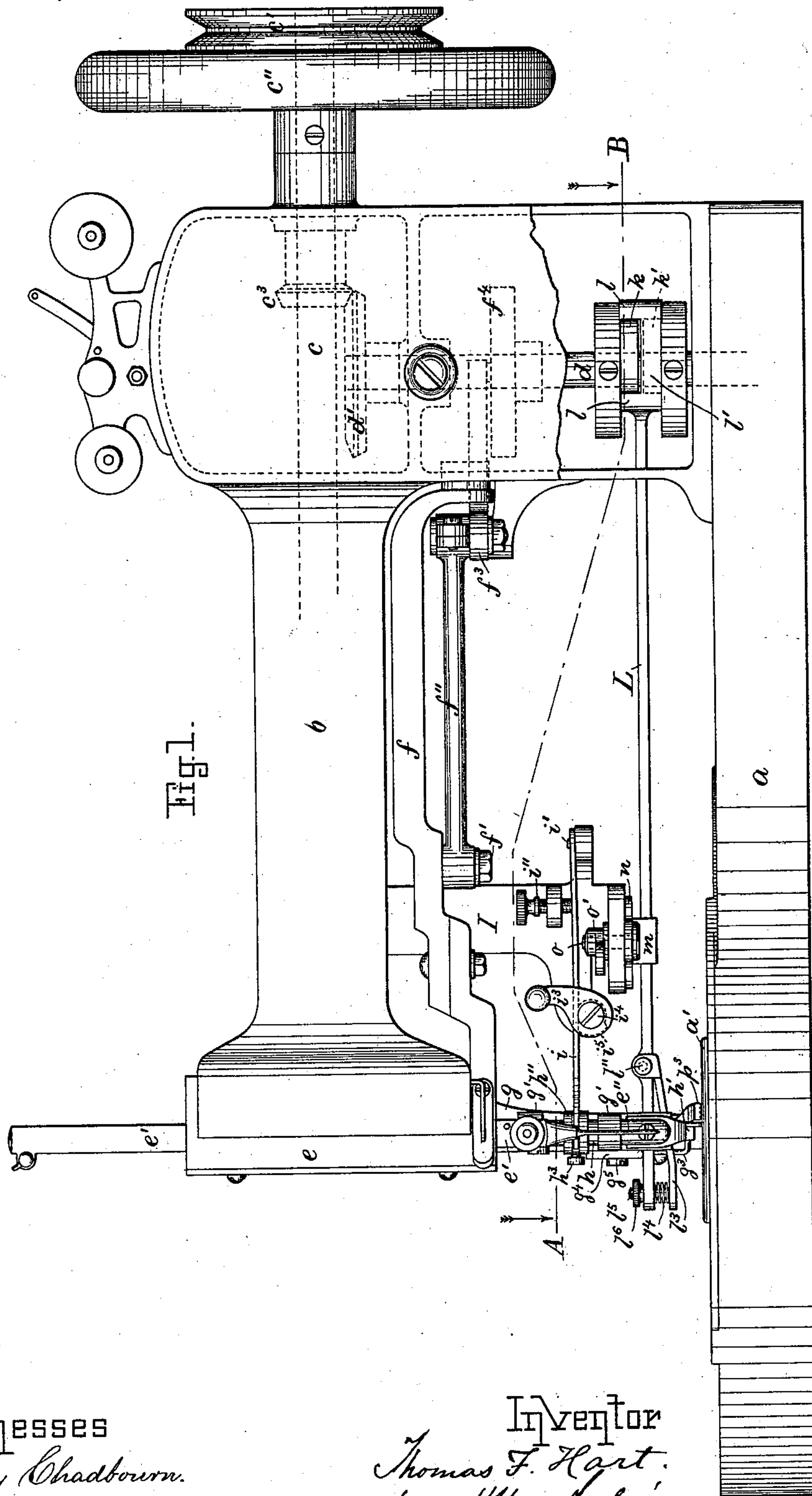
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T. F. HART.

BUTTON HOLE SEWING MACHINE.

No. 363,821.

Patented May 31, 1887.



Witnesses

Henry Chadbourne.

Charles H. Fogg.

Inventor

Thomas F. Hart.

by *Alvan Audrién*

his atty

(No Model.)

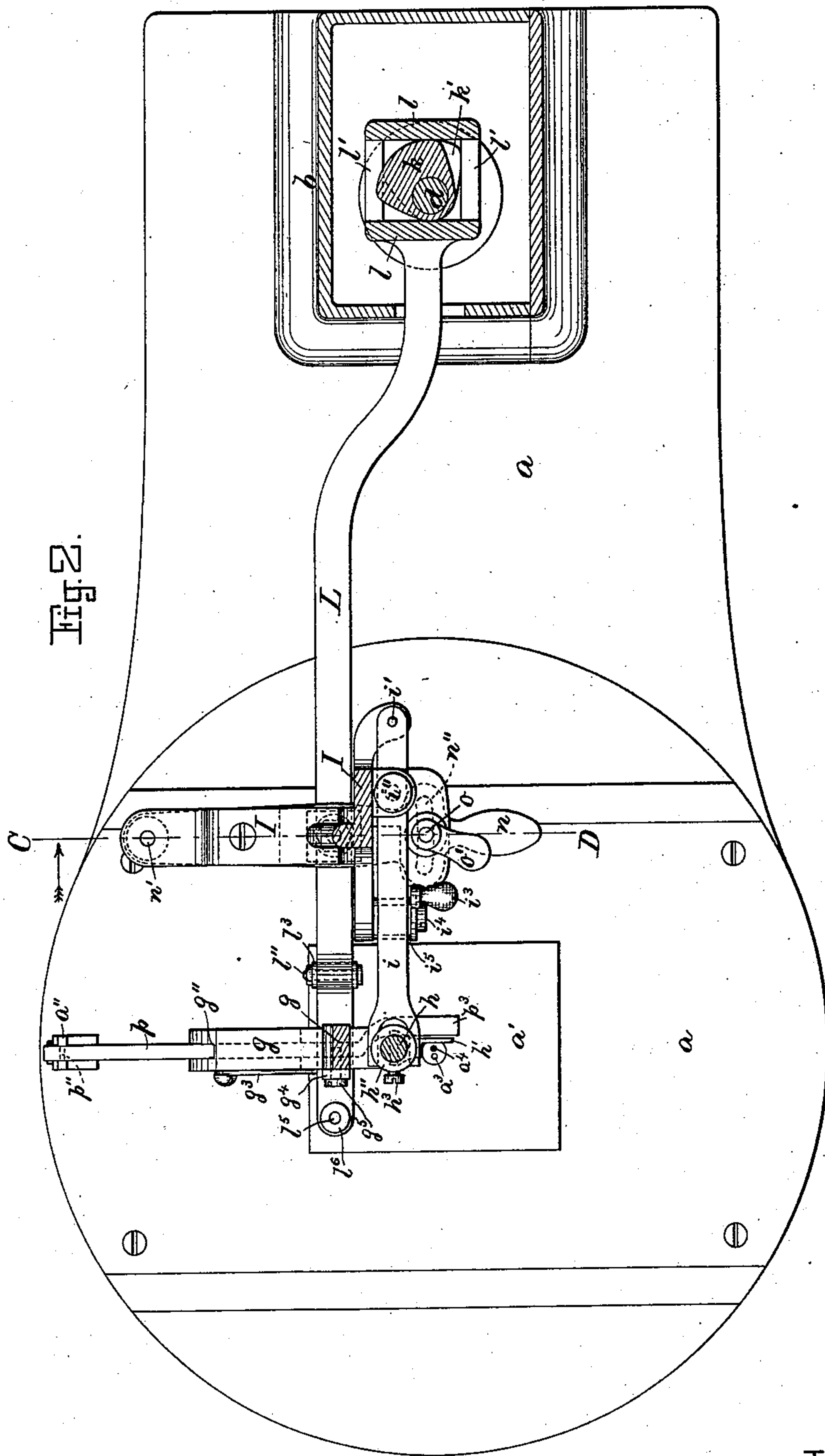
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# Inventor

Thomas F. Hart.

by Oliver Gudrén  
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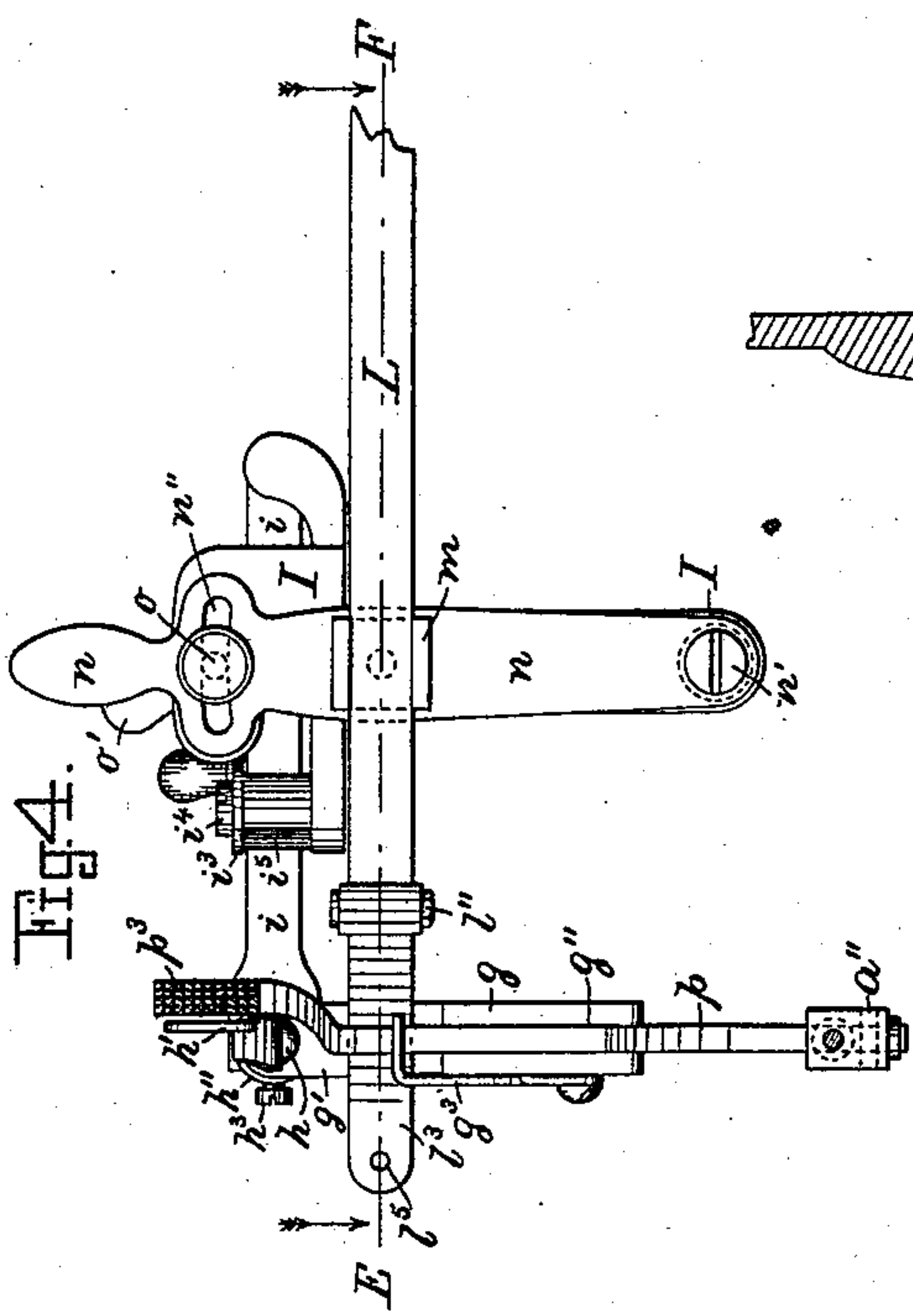
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T. F. HART.

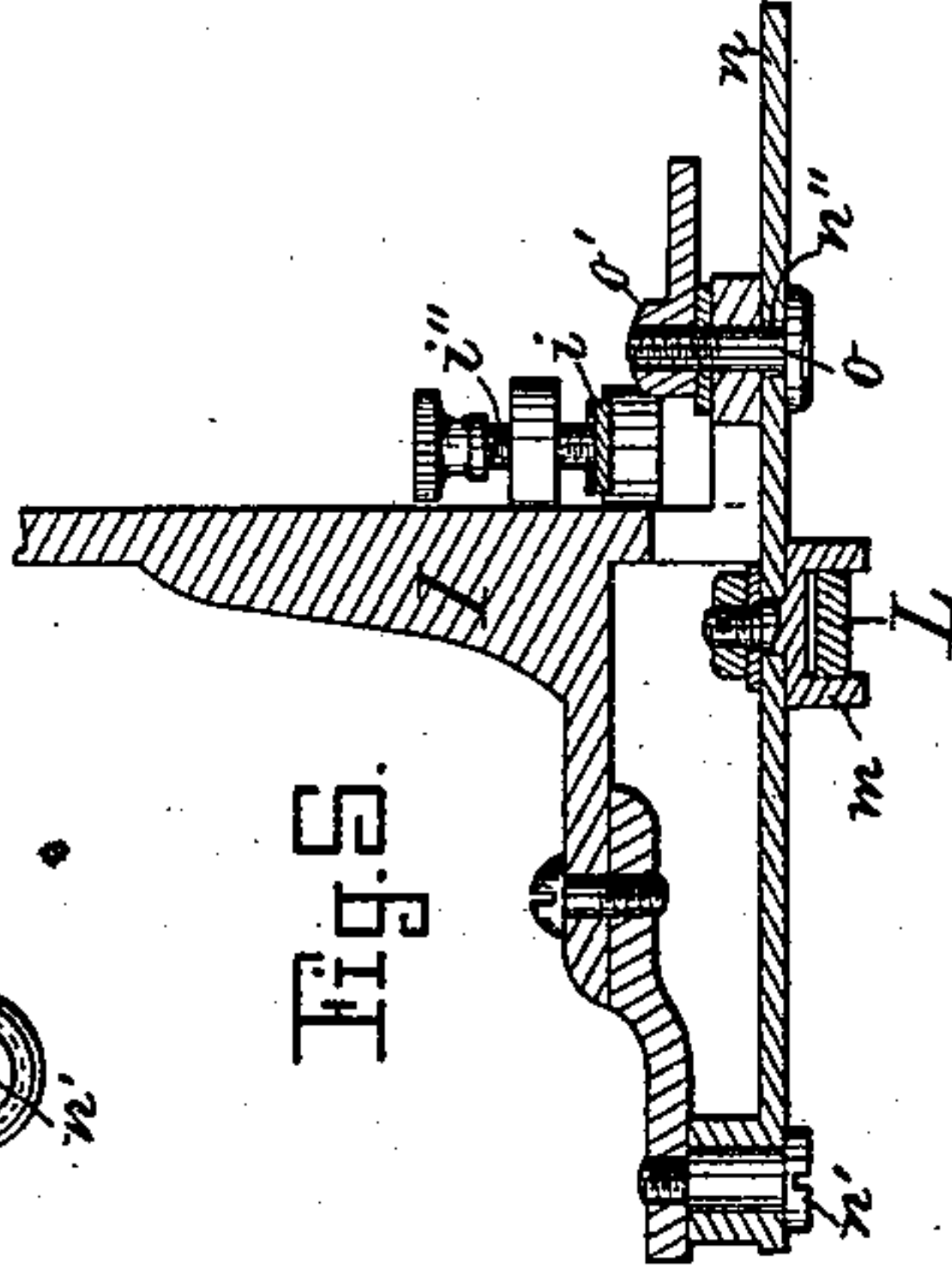
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No. 363,821.

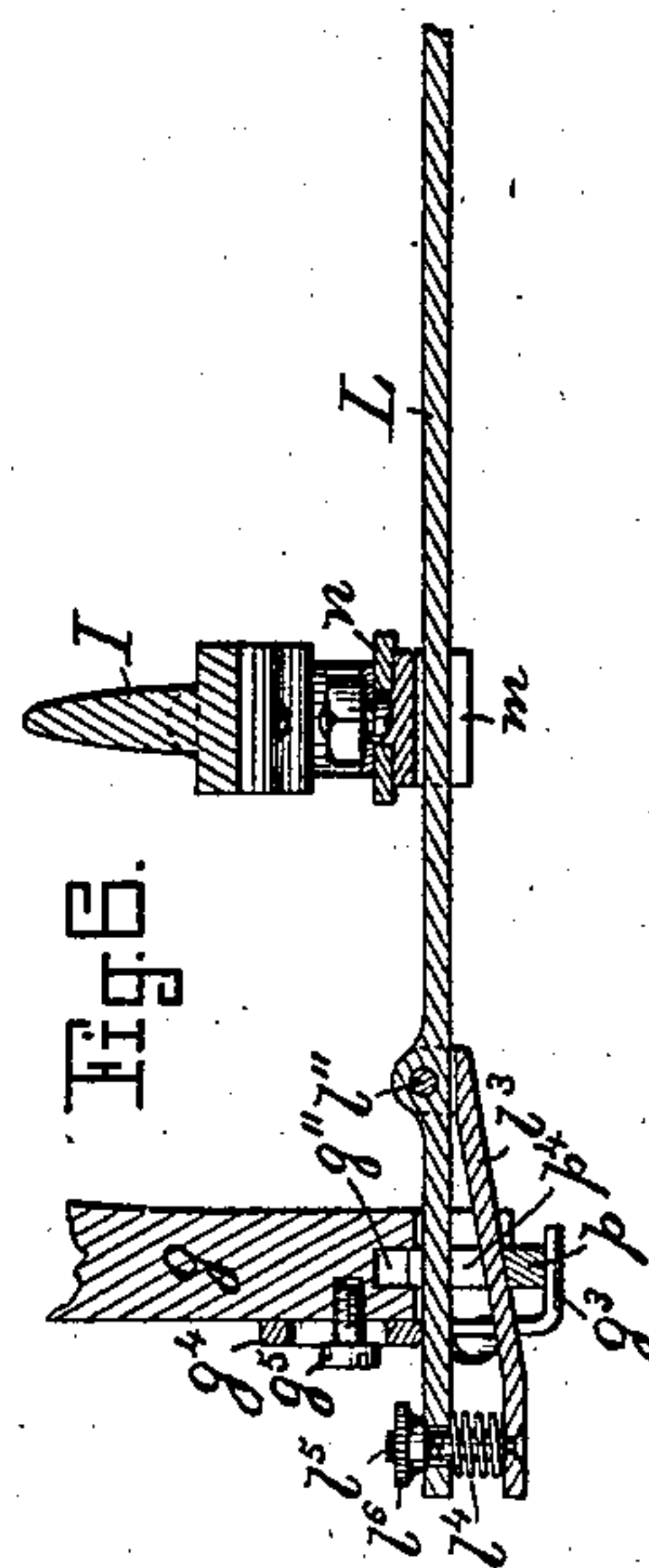
Patented May 31, 1887.



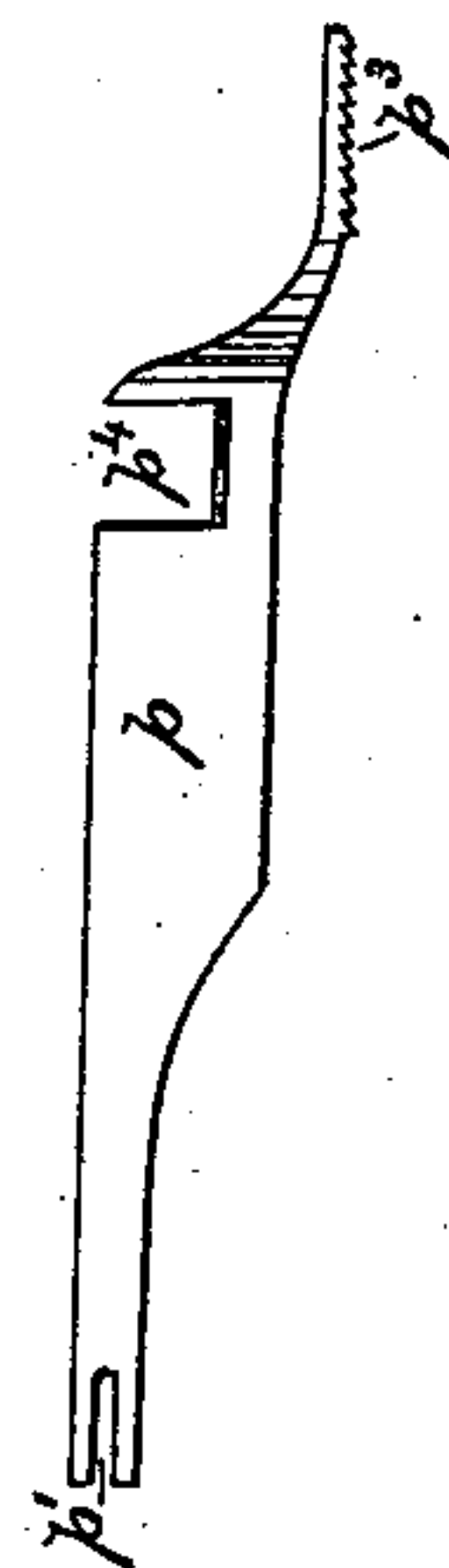
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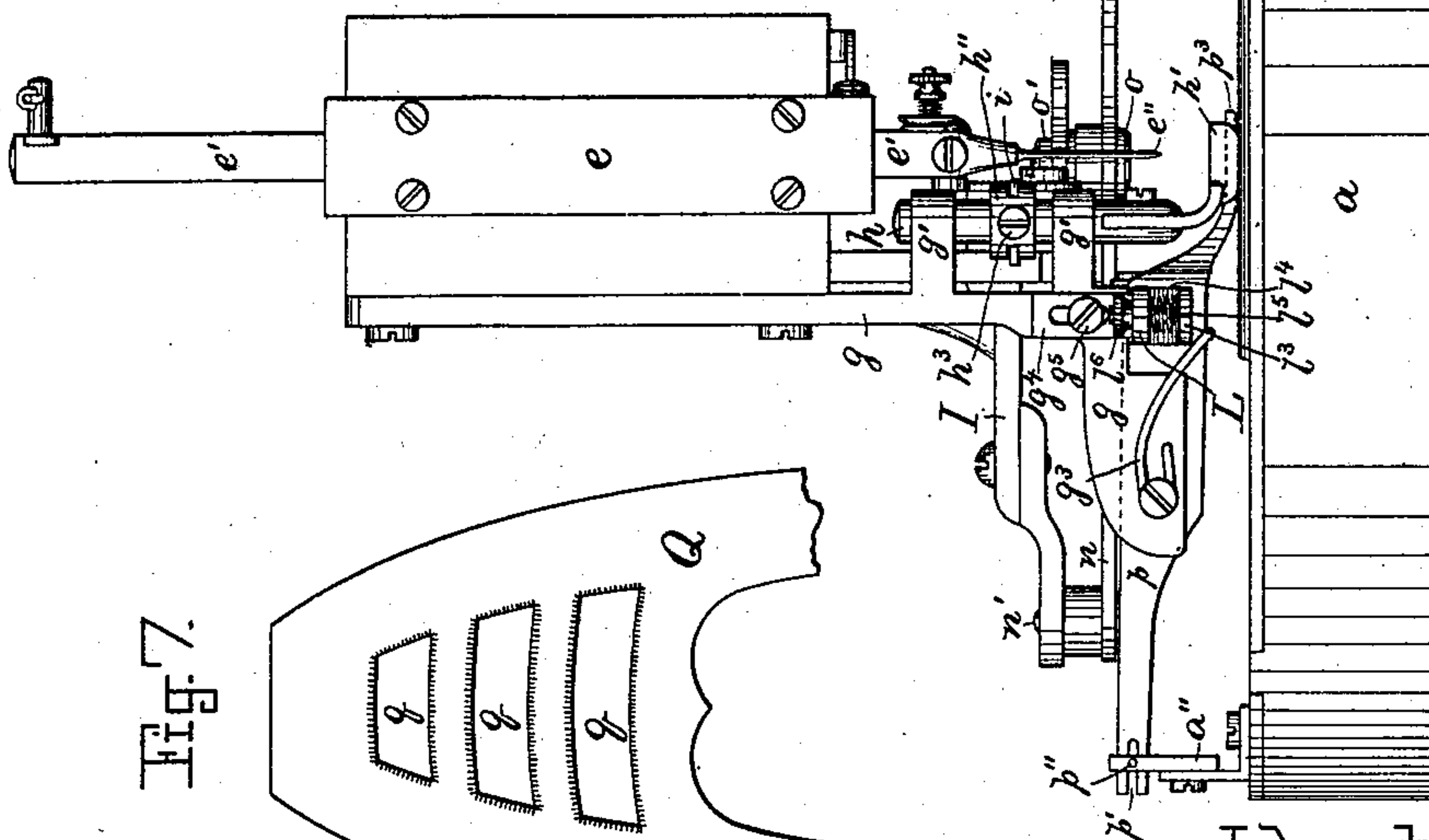
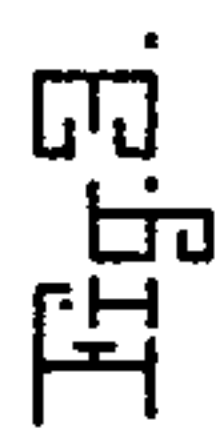
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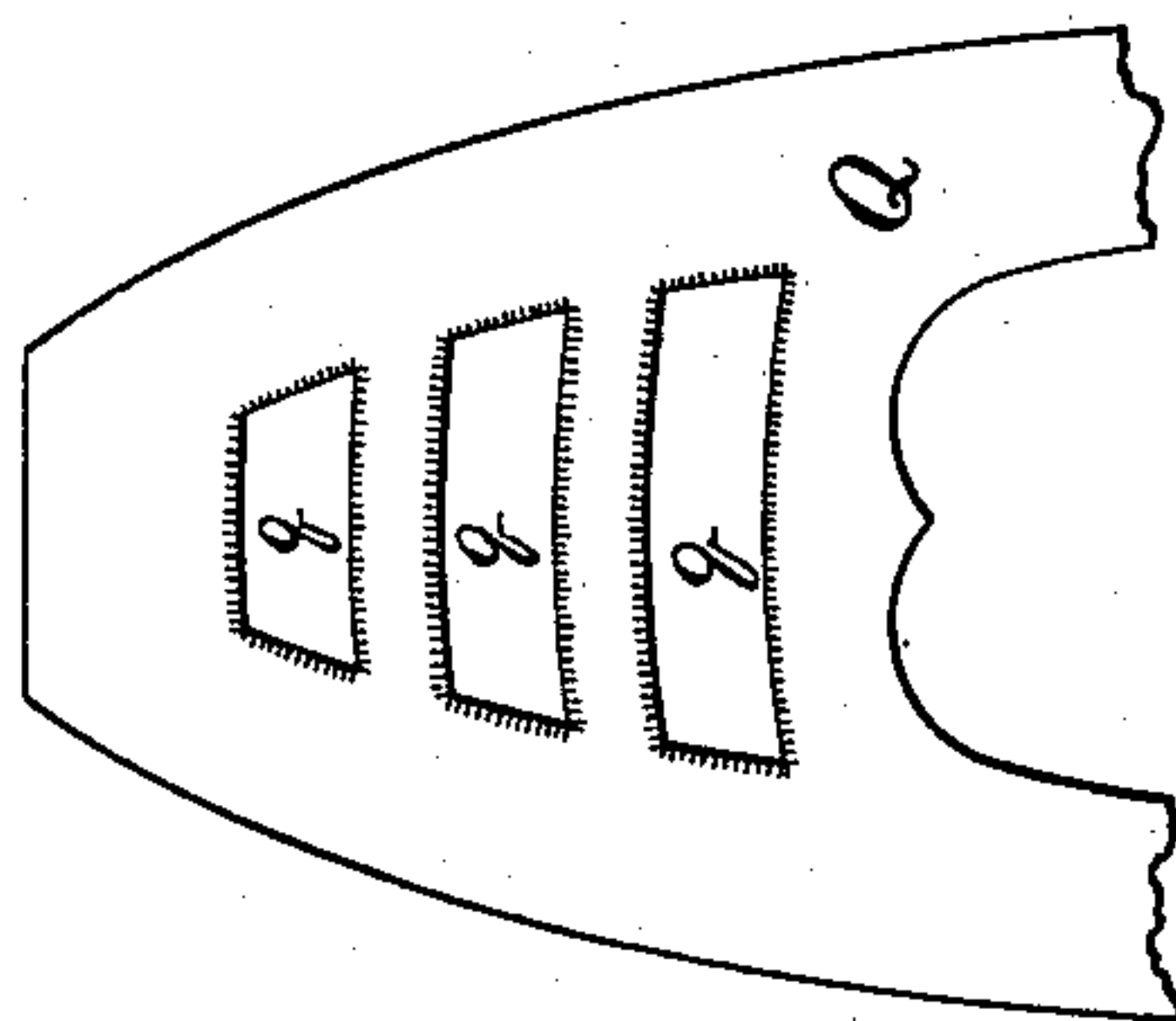
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Witnesses

Henry Chadbourn.  
Charles H. Fogg.

Inventor

Thomas F Hart.  
by Alban Kudrin  
his atty.



# UNITED STATES PATENT OFFICE.

THOMAS F. HART, OF LYNN, MASSACHUSETTS, ASSIGNOR TO MICHAEL L. HILLER, OF NEW YORK, N. Y.

## BUTTON-HOLE SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 363,821, dated May 31, 1887.

Application filed May 19, 1886. Serial No. 202,620. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS F. HART, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Button-Hole Sewing-Machines; and I do hereby declare that the same are fully described in the following specification, and illustrated in the accompanying drawings.

This invention relates to improvements in button-hole sewing-machines for the purpose of sewing with a button-hole stitch along the interior edges of perforated boot or shoe upper fronts, and for other similar purposes where a button-hole sewing-machine or other kind of sewing-machine would not be applicable for doing such particular work.

The improvement can be easily applied to any ordinary button-hole sewing-machine, as will hereinafter be more fully shown and described, reference being had to the accompanying drawings, where—

Figure 1 represents a front elevation of a button-hole sewing-machine provided with my improved attachment. Fig. 2 represents a horizontal section on the line A B, shown in Fig. 1. Fig. 3 represents an end view of the machine and my attachment. Fig. 4 represents a bottom view of the improved attachment. Fig. 5 represents a cross-section on the line C D, shown in Fig. 2. Fig. 6 represents a section on the line E F, shown in Fig. 4; and Fig. 7 represents a plan view of the front portion of a perforated boot or shoe upper. Fig. 8 represents a detail side view of the feed-bar.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

*a* represents the work-supporting plate, and *b* the goose-neck, of an ordinary button-hole sewing-machine, as shown in Figs. 1, 2, and 3.

*c* is the driving-shaft, as usual, located in bearings in the goose-neck of the machine, and provided with pulley *c'* and balance-wheel *c''*, in the ordinary manner. To the driving-shaft *c* is secured the small bevel-pinion *c'*, (shown in dotted lines in Fig. 1,) that meshes into the teeth of the bevel-gear *d'*, secured to the vertical shaft *d*, located, as usual, in bearings in the upright rear portion of the goose-neck *b*,

as shown in dotted lines in Fig. 1. The shaft *d* extends downward, as usual, and is provided with connecting mechanism below the plate *a*, in the ordinary manner for forming the stitch, such connecting mechanism being, however, not shown in the drawings.

*e* is the laterally-movable head, as usual located in guides in the outer end of the goose-neck *b*, and in such head is vertically movable the needle-bar *e'*, to the lower end of which is secured the needle *e''*, as usual.

The head *e* is moved forward and back by means of the gage-bar *f*, secured in its forward end to the lower part of head *e*, and guided in its rear end in the upright portion of goose-neck *b*, in the usual manner, as shown in Fig. 1, said gage-bar having hinged to it at *f'* the connecting-rod *f''*, the rear end of which is pivoted to a rock-lever, *f'''*, actuated by the cam-disk *f''''* on the upright shaft *d*, in the ordinary manner.

To one side of the forward end of the goose-neck *b* is secured the bracket *g*, (shown in Figs. 2, 3, 4, and 6,) such bracket having side projections, *g'* *g'*, that serve as guides for the vertically-adjustable presser-foot bar *h*, to the lower end of which is secured the presser-foot *h'*. (Shown in Figs. 1, 3, and 4.)

In doing the work on this machine it is essential that the presser-foot *h'* should bear very lightly on the material, so as to permit it to be fed forward without frictional resistance of the material between such presser-foot and the needle-plate *a'*, located on top of the work-plate *a*, and for this purpose I adjust the position of said presser-foot by the following means, viz:

I is a bracket secured to the goose-neck of the machine, and to such bracket is secured at *i'* the flat steel spring *i*, the forward free end of which is forked and resting in a groove on the collar *h''*, that is adjustably secured on the presser foot-bar *h* by means of set-screw *h'''*, or similar device, as shown in Figs. 1, 2, and 3. The downward pressure on the spring-bar *i* and presser-foot *h'* is regulated by means of set-screw *i''*, screwed through a projection on the bracket *I*, and having its lower end pressing on the spring-bar *i*, as shown in Figs. 1, 2, and 5. The presser-foot *h'* is raised, when placing the work between it and the needle-



plate  $a'$ , by means of the lever  $i^3$ , pivoted at  $i$ , to bracket I and provided with cam or projection  $i^5$ . (Shown in Figs. 1 and 4.)

The device for feeding the work relative to the needle is carried out as follows: To the vertical shaft  $d$  are secured two cams,  $k$   $k'$ , that are located within the four sides  $l$   $l'$   $l''$  of the rear end of the lever L, which has hinged at  $l''$ , near its forward end, the inclined plate or bar  $l^3$ , the outer end of which is automatically held downward by the influence of a spring,  $l^4$ , placed between the outer ends of lever L and inclined plate  $l^3$ , as shown in Figs. 1 and 6, and the inclination and distance of the outer end of said plate  $l^3$  from the under side of lever L may be regulated and adjusted by means of a nut,  $l^5$ , and screw-bolt  $l^6$ . (Shown in said Figs. 1 and 6.) Between its outer and inner end the lever L is guided in the forked fulcrum-piece  $m$ , secured in a suitable manner to the lever  $n$ , that is pivoted at  $n'$  to the rear lower portion of the bracket I, as shown in Figs. 2, 4, and 5. The lever  $n$  has a slot-hole,  $n''$ , at or near its free end, through which passes the screw-bolt  $o$ , and after said screw has been inserted through a perforation in the lower portion of bracket I it is firmly secured in place by means of the nut  $o'$ . (Shown in Figs. 1, 2, and 5.) By adjusting the position of lever  $n$ , by swinging it on its fulcrum  $n'$ , it will be seen that the fulcrum-piece  $m$  will be brought nearer to or farther from the needle, and thus the rocking motion of the outer end of lever L can be adjusted to a nicety, which rocking motion controls the amount of feed desired.

$p$  is the feed-bar, having a rear forked end,  $p'$ , as usual, that is pivoted at  $p''$  to a projection,  $a''$ , attached to work-plate  $a$ , as shown in Figs. 2, 3, and 4. The feed-bar  $p$  has a serrated foot,  $p^3$ , in its free end, adapted to rest on the work while in the process of being sewed. Between the ends of feed-bar  $p$  is a recess,  $p^4$ , on the upper side, as shown in Fig. 8, in which projects the outer end of lever L and its inclined plate or bar  $l^3$ , as shown in Figs. 3 and 6.

The feed-bar  $p$  is guided in its forward-and-back motion in a slot or recess,  $g''$ , in the lower end of the bracket  $g$ , as shown in Fig. 6, and its free end is automatically raised above the work by the influence of the spring  $g^3$ , secured in one end to bracket  $g$ , and having its other end pressing on the under side of feed-bar  $p$ , as shown in Figs. 3, 4, and 6, when not pressed downward onto the work by the lever L and its inclined plate  $l^3$ .

$g^4$  is a slotted pressure-plate adjustably secured to the lower portion of the bracket  $g$  by means of set-screw  $g^5$ . (Shown in Figs. 3 and 6.) Such plate  $g^4$  is adapted to rest with its lower edge against the upper side of the lever L, and, according to its position on bracket  $g$ , a more or less pressure on the feed-bar  $p$  is occasioned through the medium of the lever L and its hinged plate  $l^3$  as the latter is drawn backward by the cam  $k$ .

Q in Fig. 7 represents the front portion of a perforated boot or shoe upper, and  $q$   $q$   $q$  rep-

resent the perforations thereon, the edges of which are to be button-hole stitched by my improved device.

$a^3$  and  $a^4$  in Fig. 2 are the perforations, as usual, in the needle-plate  $a'$ , through which the needle passes alternately in forming the stitches.

The operation of the machine is as follows: The article to be button-hole stitched on the edges of its perforations is placed on the needle-plate  $a'$  after the presser-foot  $h'$  and feed-bar  $p$  have been raised sufficiently to enable the article to be introduced between them and the plate  $a'$ . The machine is set in operation as usual, and a button-hole stitch formed by the vertically and laterally movable needle, its thread, and the second thread and mechanism below the work-plate  $a$ , as is usual on button-holesewing-machines. The feed of the material takes place when the needle has passed upward out of it by means of the lever L being drawn backward by the action of cam  $k$  on the rear projection,  $l$ , of said lever, causing the serrated foot  $p^3$  of feed-bar  $p$  to be forced onto the upper side of the material by the agency of the inclined plate  $l^3$  and pressure-plate  $g^4$ , as hereinabove described, after which the cam  $k'$  acts on one of the side projections  $l'$  in the end of lever L, causing it to be rocked on its fulcrum  $m$ , so that its forward end, together with plate  $l^3$  and feed-bar  $p$ , is made to move the desired distance away from the operator, as required for making another stitch. During the completion of the rotation of shaft  $d$  the lever L is pushed forward by cam  $k$ , causing inclined plate  $l^3$  to release its downward pressure on feed-bar  $p$ , that is then lifted free of the work by the agency of the spring  $g^3$ , to permit the work to be guided according to its shape and configurations, and so on.

In practice I prefer to make the two cams  $k$  and  $k'$  independent of each other and secured in a suitable manner to the shaft  $d$ , so that their respective positions on said shaft may be adjusted to a nicety to obtain the proper movement of the lever L.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. In a button-hole-stitch sewing-machine, the rotary cams  $k$   $k'$ , the feed-bar  $p$ , and the four-motion lever L, actuated by said cams and guided in the adjustable fulcrum-piece  $m$ , said lever L having hinged to its outer end the spring-pressed inclined plate  $l^3$ , arranged within the recess  $p^4$  of the feed-bar  $p$ , as and for the purpose set forth.

2. In a button-hole-stitch sewing-machine, the stationary bracket  $g$  and adjustable pressure-plate  $g^4$ , mounted thereon, combined with the four-motion lever L and its spring-pressed pivoted plate  $l^3$  and the four-motion feed-bar  $p$ , with its spring  $g^3$ , as and for the purpose set forth.

3. In a button-hole-stitch sewing-machine, the presser-foot  $h'$ , its bar  $h$ , and grooved collar  $h''$ , combined with the stationary bracket



I, spring *i*, secured to it, and having its free end connected to collar *h''*, the regulating-screw *i''*, and lever *i<sup>3</sup>*, with its cam or projection *i<sup>5</sup>*, as and for the purpose set forth.

- 5 4. In a button-hole-stitch sewing-machine, the four-motion lever *L* and its pivoted and spring-pressed plate *l<sup>3</sup>* and feed-bar *p*, combined with the adjustable fulcrum-piece *m*, arranged upon the lever *n*, the latter being pivoted to  
10 stationary bracket *I* and provided with fastening-screw device *o o'*, as and for the purpose set forth.

5. The lever *L*, having spring-pressed pivoted inclined plate *l<sup>3</sup>* in one end, an adjustable fulcrum-piece, *m*, between its ends, and projec- 15  
tions *l l' l''*, combined with the feed-bar *p*, the rotary shaft *d*, and its cams *k k'*, as and for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

THOMAS F. HART.

Witnesses:

ALBAN ANDRÉN,  
HENRY CHADBURN.