

(No Model.)

2 Sheets—Sheet 1.

T. F. HART.

BUTTON HOLE SEWING MACHINE.

No. 363,823.

Patented May 31, 1887.

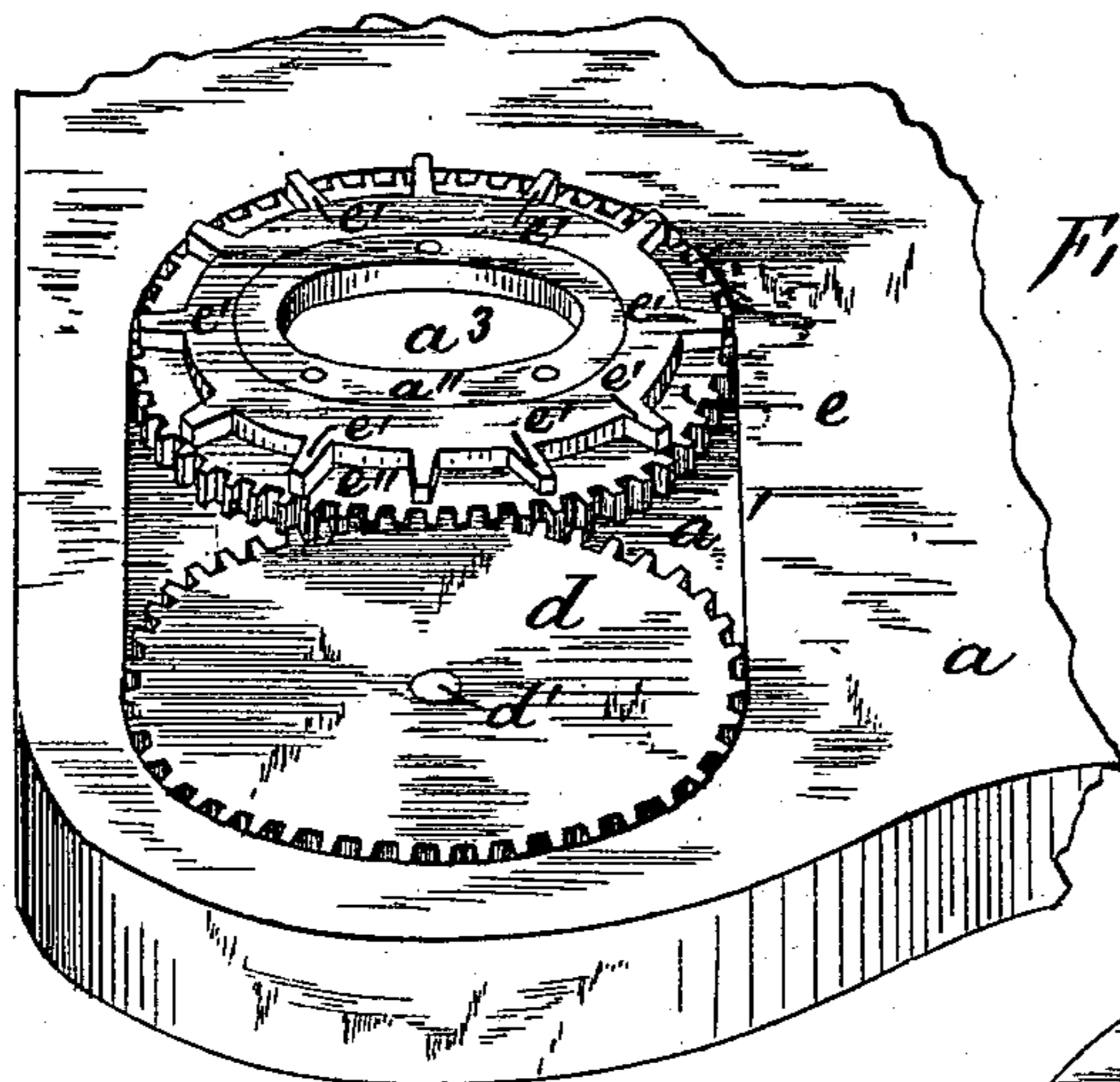
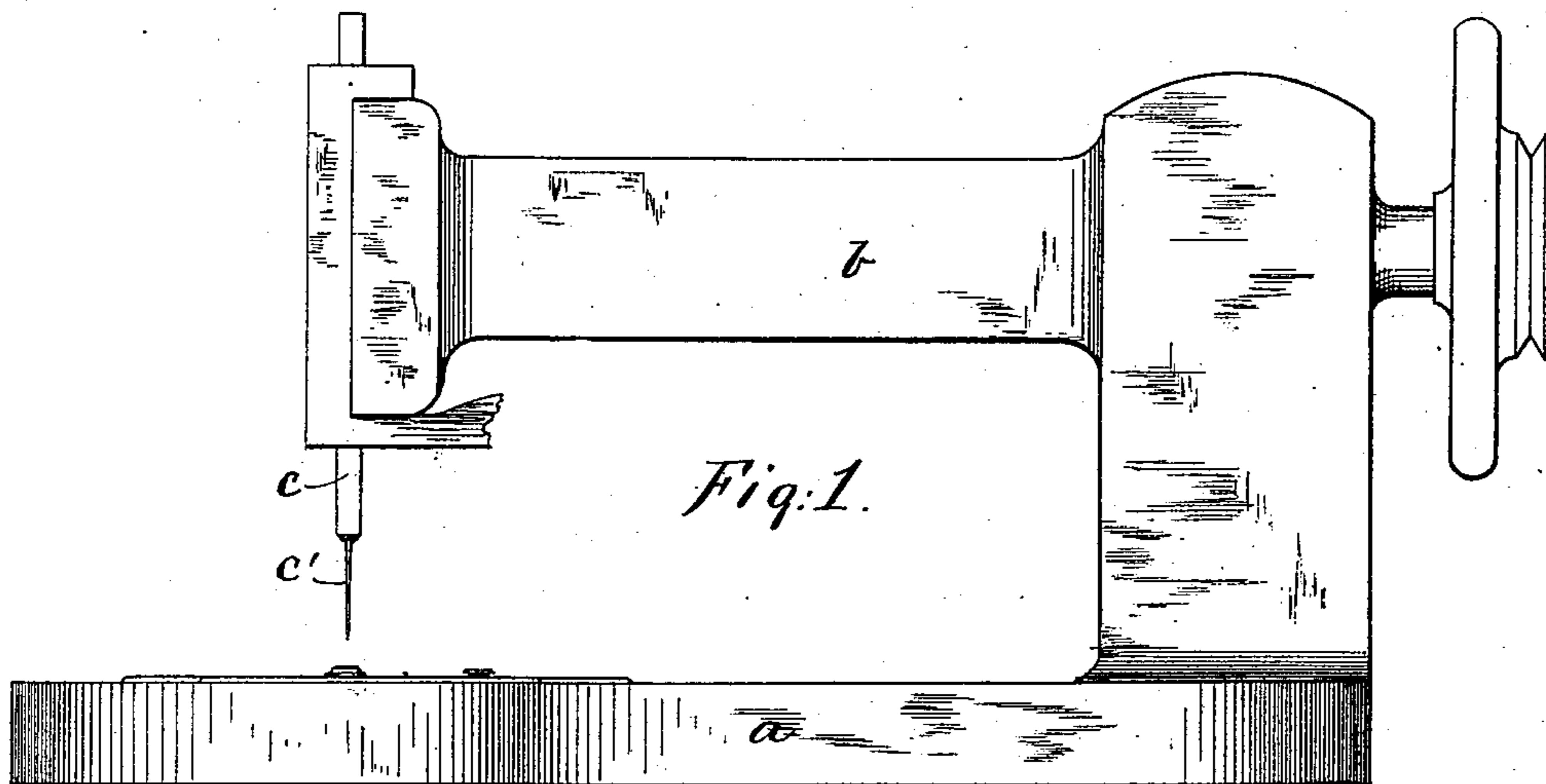


Fig. 4.

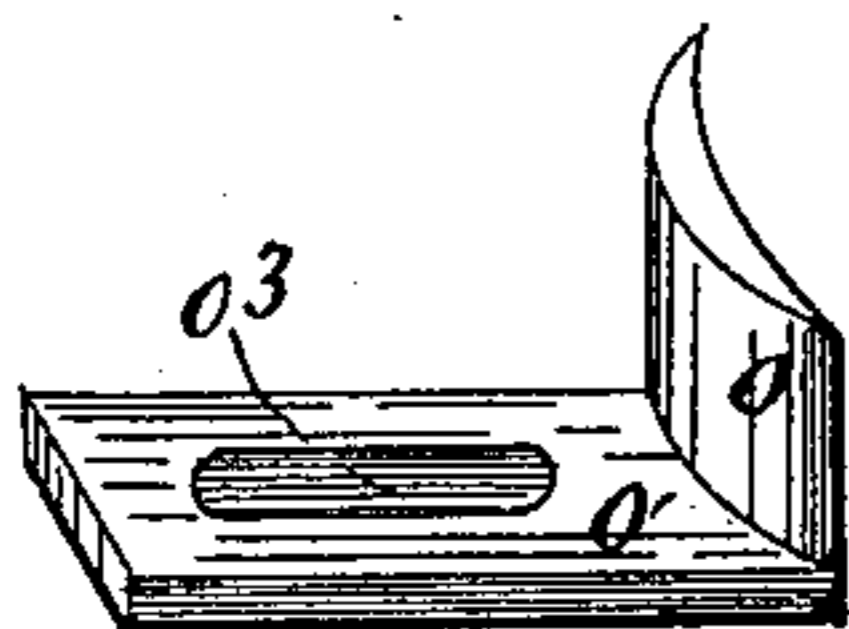


Fig. 6.

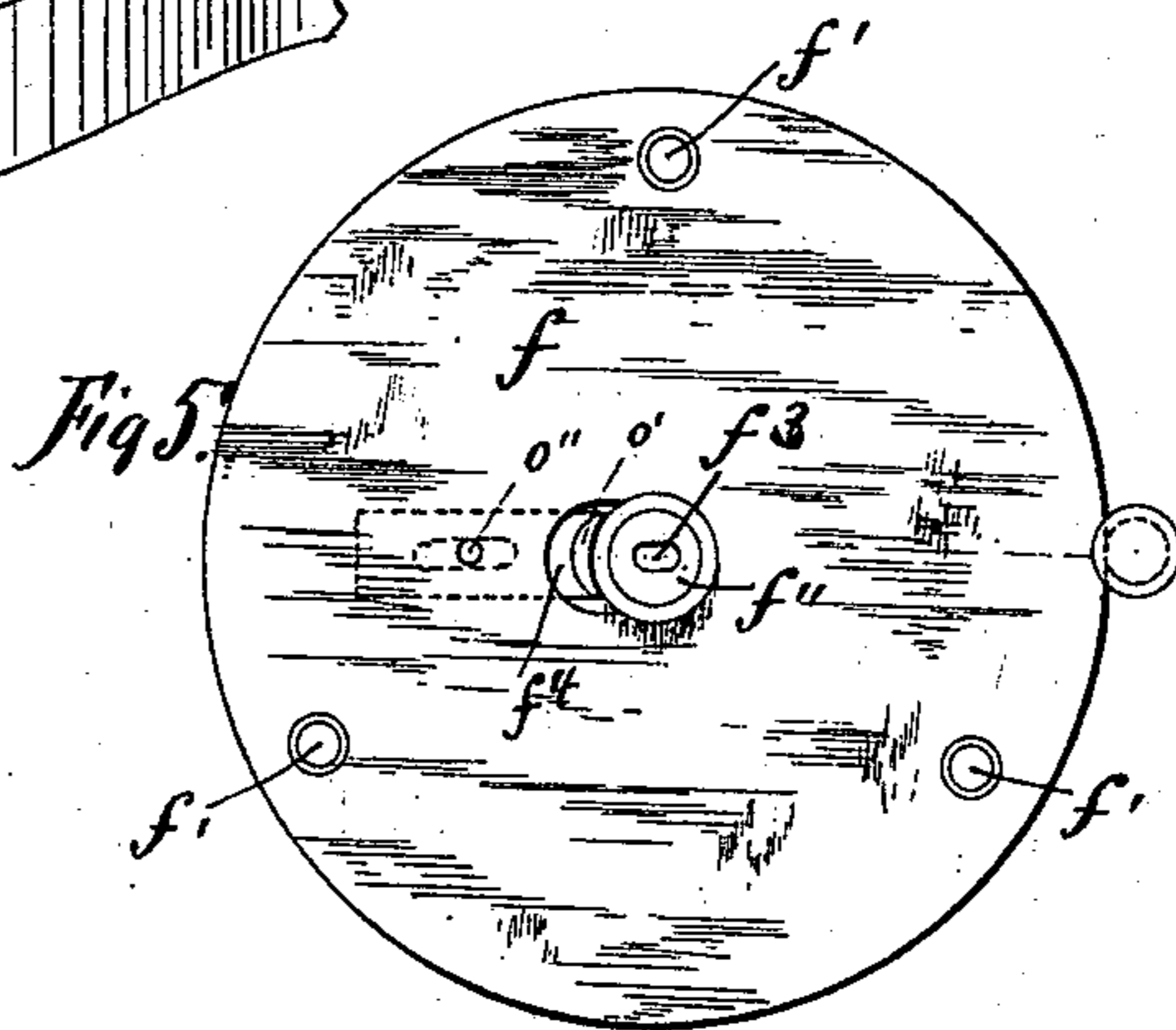


Fig. 5.

Witnesses:  
Charles H. Fry,  
Henry Chadbourne.

Inventor:  
Thomas F. Hart.  
by *Alvan Auden*  
his atty.

(No Model.)

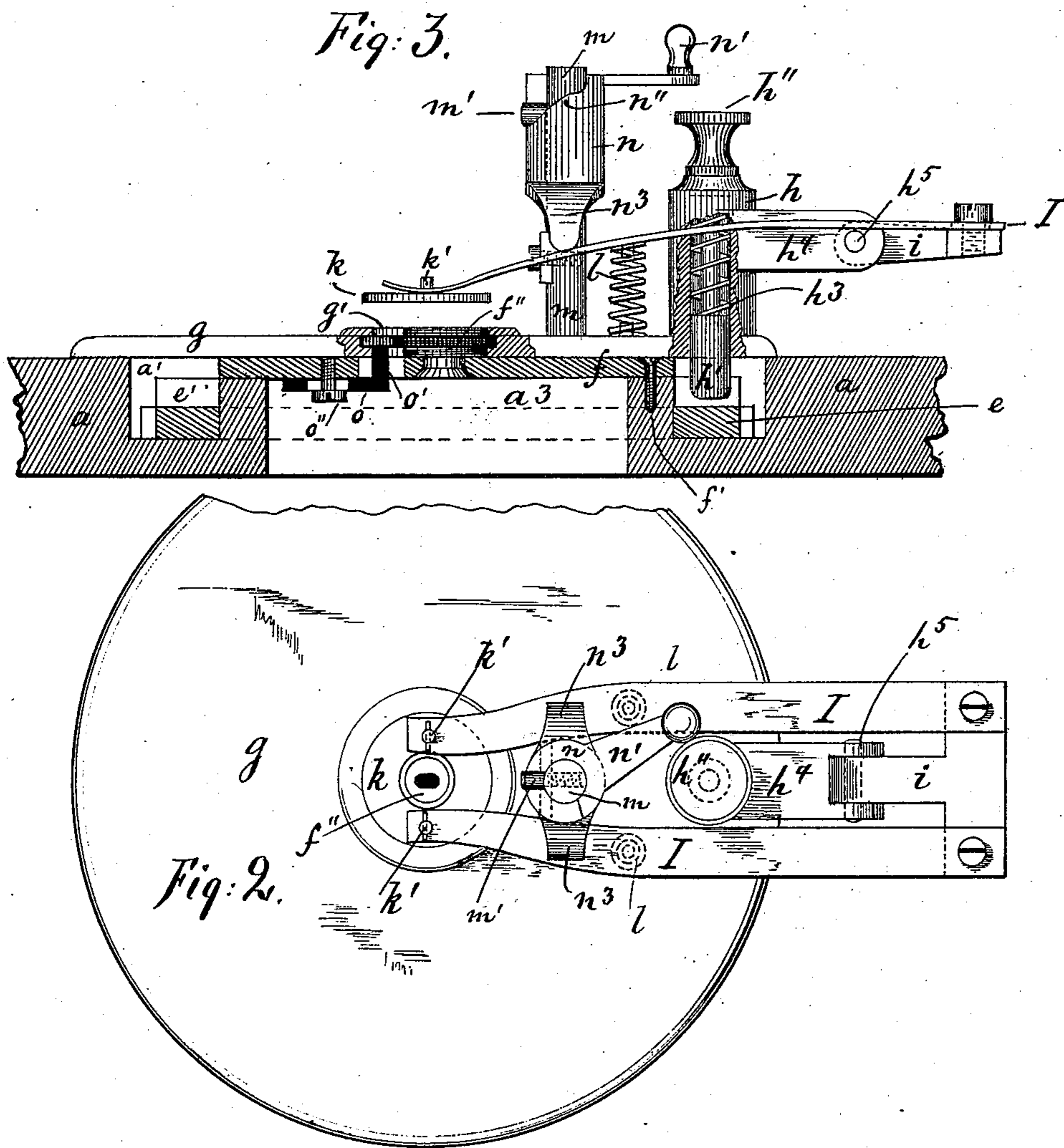
2 Sheets—Sheet 2.

T. F. HART.

BUTTON HOLE SEWING MACHINE.

No. 363,823.

Patented May 31, 1887.



Witnesses:  
Charles H. Fogg,  
Henry Chadbourne.

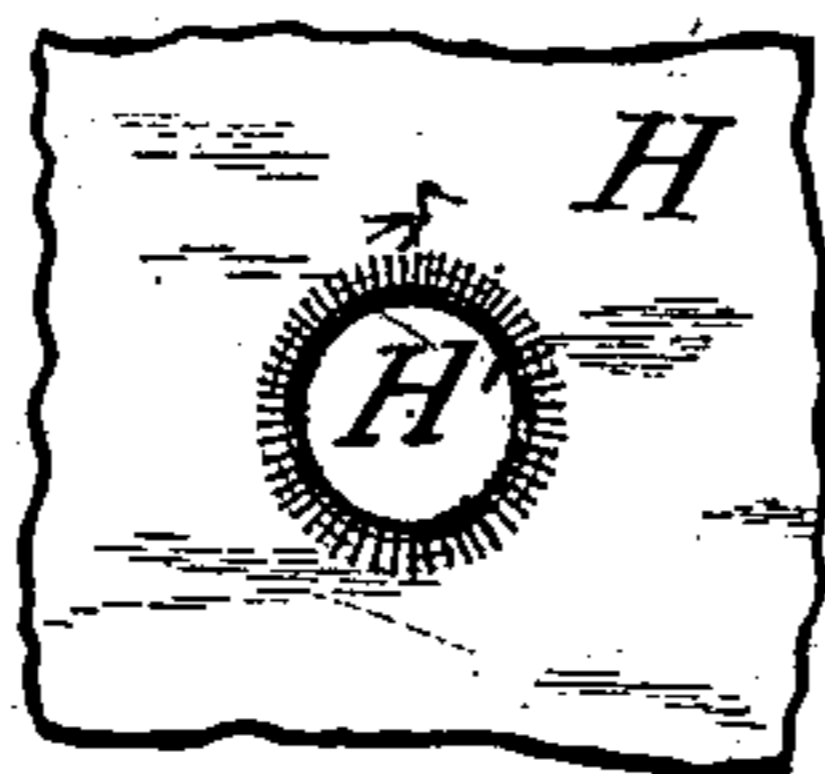


Fig. 7. Inventor:  
Thomas F. Hart,  
by Allan Audren  
his atty.

# 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. 363,823, dated May 31, 1887.

Application filed June 16, 1886. Serial No. 205,334. (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 for Sewing Round Holes; 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 stitching around the edges of round holes; and it is carried out as follows, reference being had to the accompanying drawings, where—

Figure 1 represents a front elevation of an ordinary button-hole sewing-machine provided with my improvement. Fig. 2 represents a plan view of the clamp. Fig. 3 represents a sectional side elevation of the clamp with the button-plate, bed, and clamp-operating gear shown in section. Fig. 4 represents a perspective detail view of the driving and clamp-operating gears. Fig. 5 represents a plan view of the button and button-plate. Fig. 6 represents a detail perspective view of the clamp guide-block, and Fig. 7 represents a plan view of a piece of work done on the machine.

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

*a* is the bed, *b* the goose-neck, and *c* the vertically and laterally movable needle-bar, as usual on button-hole sewing-machines.

*c'* is the needle secured to the lower end of the needle-bar *c*, as shown in Fig. 1.

In a recess, *a'*, in the top of the bed *a* is located the usual driving-gear, *d*, attached to shaft *d'*, that is set in a rotary motion from the driving-shaft of the sewing-machine in the usual manner. The gear *d* meshes into the teeth of the clamp-operating gear *e*, that is made to turn around the annular ring *a''*, forming a part of the bed *a*, as shown in Figs. 3 and 4.

*a<sup>3</sup>* is a central perforation in the interior of the annular ring *a''* for the needle to pass up and down through in forming the stitches. On the upper side of the clamp-operating gear *e* are a number of radial ribs or walls, *e' e'*, and intermediate recesses or grooves, *e'' e''*, as shown

in Figs. 3 and 4, for a purpose as will herein-after be more fully described.

*f* is the button-plate secured to the top of the stationary annular ring *a''* by means of suitable screws *f' f' f'*, as shown in Figs. 3 and 5, and to the central portion of such button-plate is secured the button *f''*.

*f<sup>3</sup>* is a vertical slotted perforation through the button *f* for the vertically and laterally movable needle *c'* to pass when forming the stitches. Above the button-plate *f* is located the clamp-plate *g*, having a central grooved perforation, *g'*, into which the button *f''* projects, such perforation being, however, larger in diameter than the button *f''*, according to the size of the hole *H'* in the material, *H*, (shown in Fig. 7,) to be button-hole stitched.

Secured to and rising from the clamp-plate *g* is the hollow clamp-post *h*, in which is vertically adjustable the stud *h'*, having knob or handle *h''* on its upper end and normally held in the operative position shown in Fig. 3 by the influence of the coiled spring *h<sup>3</sup>*. The lower end of the stud *h'* is made to project in any desired one of the grooves or recesses *e''* on the upper portion of the clamp-operating gear *e*, as shown in Fig. 3. To the front of the post *h* is secured, or made in one piece with it, the ear *h<sup>4</sup>*, to which is pivoted at *h<sup>5</sup>* the T *i*, to the front of which are secured the clamp-arms *I I*. (Shown in Figs. 2 and 3.)

*k* represents the annular clamp-jaw, having upwardly-projecting pins *k' k'* projecting through perforations in the free ends of the clamp-arms *I I* and pivoted to the latter in a suitable manner, as shown in Figs. 2 and 3.

*l l* are pressure-springs located between the upper side of clamp-plate *g* and under side of the clamp-arms *I I*, as shown in Fig. 3, for the purpose of automatically raising the clamp-arms *I I* to the position shown in Fig. 3 as soon as the pressure device is relieved.

The material to be stitched is confined and held firmly between the under side of the annular clamping-jaw *k* and central upper portion of the clamp-plate *g* by means of the pressure device shown in Figs. 2 and 3, such pressure device consisting of the vertical rod *m*, rising from and secured to the clamp-plate *g*, and provided with a horizontal pin or projection, *m'*, at or near its upper end. Surround-

ing the rod *m* is a sleeve, *n*, having attached to its upper end a crank, *n'*, and having a cut-away cam-surface, *n''*, as shown in Fig. 3.

*n<sup>3</sup> n<sup>3</sup>* are ears on the under side of the sleeve *n*, bearing on the uppersides of the clamp-arms I I, as shown in Figs. 2 and 3. After the material to be stitched is placed between the central portion of clamp-plate *g* and under side of clamp-jaw *k* the latter is forced downward upon the upper side of the material, so as to hold it firmly in place on the clamp-plate by turning the sleeve *n* a part of a revolution around the rod *m*, causing it to move downward by the cam-surface *n''* acting on the stationary projection *m'* on rod *n*, by which operation the ears *n<sup>3</sup> n<sup>3</sup>* are caused to force the free ends of the clamp-arms I I downward, and with them the clamp-jaw *k*. After the edge of the circular hole in the material *H* has been button-hole stitched said material is released from its confinement between the clamp-plate *g* and clamp-jaw *k* simply by turning the crank *n'* and its sleeve *n* in an opposite direction around the stationary rod *m*, allowing the clamp-arms I I to rise by the influence of the springs *l l*.

During the operation of button-hole stitching the edge of the hole *H'* in the material, *H*, the clamp-plate *g*, and the clamp-jaw *k* are made to partake of the rotation of the clamp-operating gear *e* by the lower end of the stud *h'* resting in any one of the grooves or recesses *e'' e''* on the said gear *e*; and the object of such recesses or grooves *e'' e''* is to enable the stud *h'* to be placed in front of the operator and locked to the gear *e* when commencing the work on a new piece of material, and thus to facilitate the proper placing of the material on the clamp-plate before the machine is set in operation. In button-hole stitching a circular hole it has been found necessary to rotate the clamp-plate a little more than one complete revolution, and if it were not for the grooves or recesses *e'' e''* on the clamp-operating gear *e*, combined with the vertically-adjustable stud *h'*, the position of the clamp would vary after the completion of each piece stitched, and this objection is entirely overcome by the aforesaid clamp-adjusting device.

For the purpose of properly guiding the clamp-plate *g* during its eccentric rotation around the button *f''*, I secure, in an adjustable manner, to the under side of the button-plate *f* the clamp-guide block *o*, (shown in Fig. 3, as well as in detail in Fig. 6,) such guide-block having an upwardly-projecting lip, *o'*, that is held against the interior edge of the per-

foration *g'* in clamp-plate *g*, and said guide-block is capable of a lateral adjustment by means of the set-screw *o''*, passing through a slot-hole, *o<sup>3</sup>*, in the guide-block *o* and screwed into a screw-threaded perforation in the button-plate *f*, as shown in Fig. 3.

The perforation *g'* in clamp-plate *g*, in proportion to the diameter of button *f''*, is made according to the diameter of the hole *H'* to be button-hole stitched in the material, *H*.

*f<sup>+</sup>* is a slot-hole in the button-plate *f*, through which the lip *o'* projects, to enable the guide-block *o* to be adjusted laterally for the purpose set forth.

The operation of forming the stitches is the same as in ordinary button-hole sewing-machines, and need not here be described.

What I wish to secure by Letters Patent and claim is—

1. In a button-hole sewing-machine for the purpose set forth, the rotary clamp-operating gear *e* and its notches or recesses *e'' e''*, combined with the clamp plate *g* and yielding clamp-jaw *k*, connected to the clamp-arms I I, means, substantially as described, for forcing the arms I I downward, and the vertically-adjustable spring-pressed pin *h'*, for locking the clamp-plate *g* and notched gear *e* together in any desired position, as set forth.

2. In a button-hole sewing-machine for the purpose set forth, the stationary button-plate *f* and its perforated button *f''*, in combination with the horizontally-adjustable clamp guide-block *o* and its upwardly-projecting lip *o'*, adapted to bear against the interior edge of the perforation *g'* in clamp-plate *g*, the clamp-jaw *k* and its arms I I, the clamping device, as described, and means, substantially as described, for locking the gear *e* and clamp-plate *g* together, as set forth.

3. In a button-hole sewing-machine for the purpose set forth, the stationary plate *f* and its perforated button *f''*, the rotary gear *e*, having notches or recesses, as described, the plate *g*, having the spring-pressed pin *h'*, for connecting it to gear *e*, the clamp-plate *k*, mounted on or connected to clamp-arms I I and having springs *l l*, and clamping device, all arranged and combined substantially 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.