

(Model.)

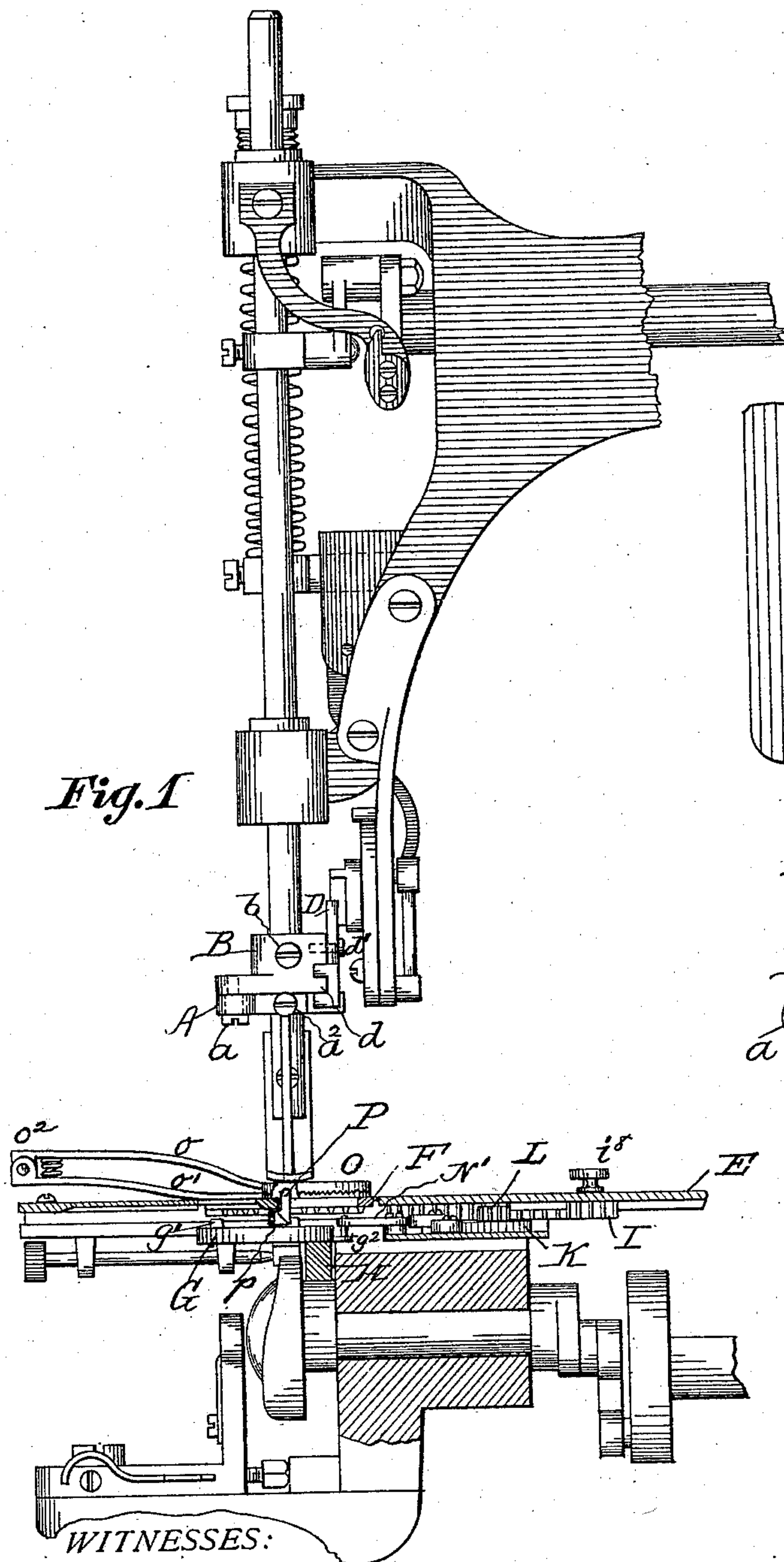
3 Sheets—Sheet 1.

C. M. BANKS.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 286,989.

Patented Oct. 23, 1883.



WITNESSES:

S. J. Van Stavoren
William F. Cook

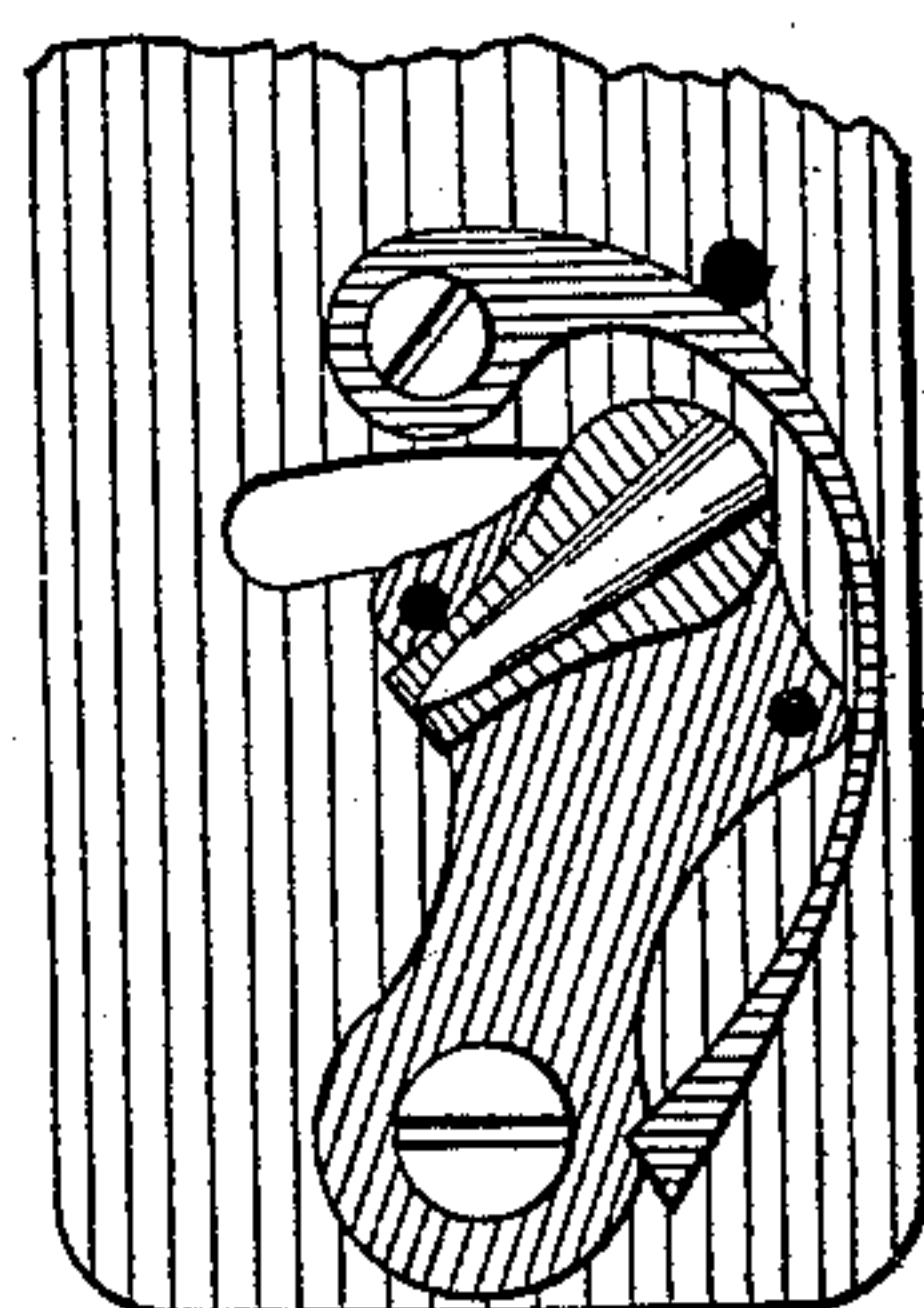


Fig. 2

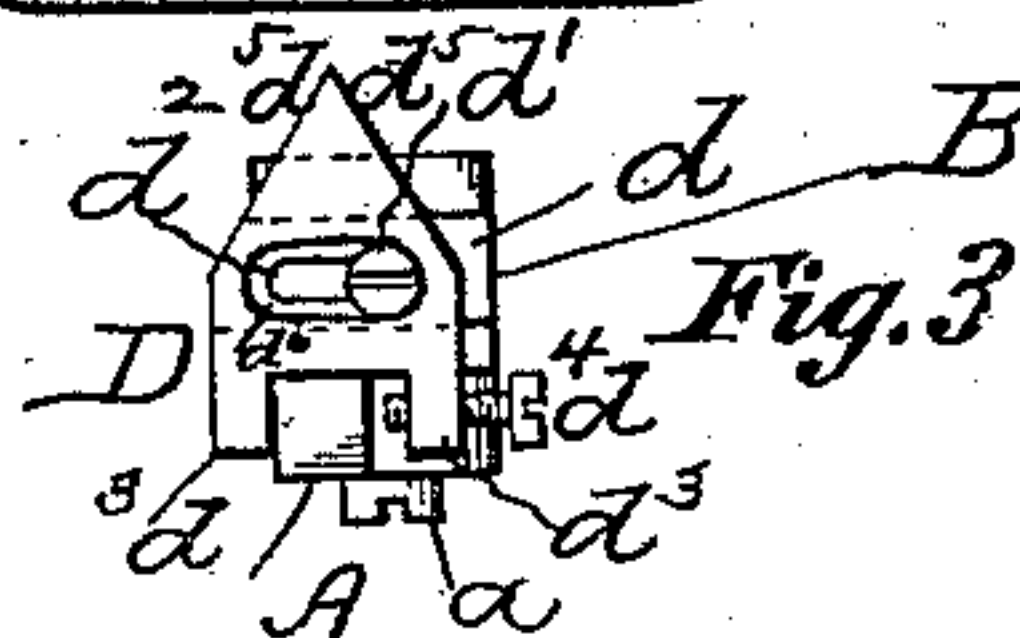


Fig. 3

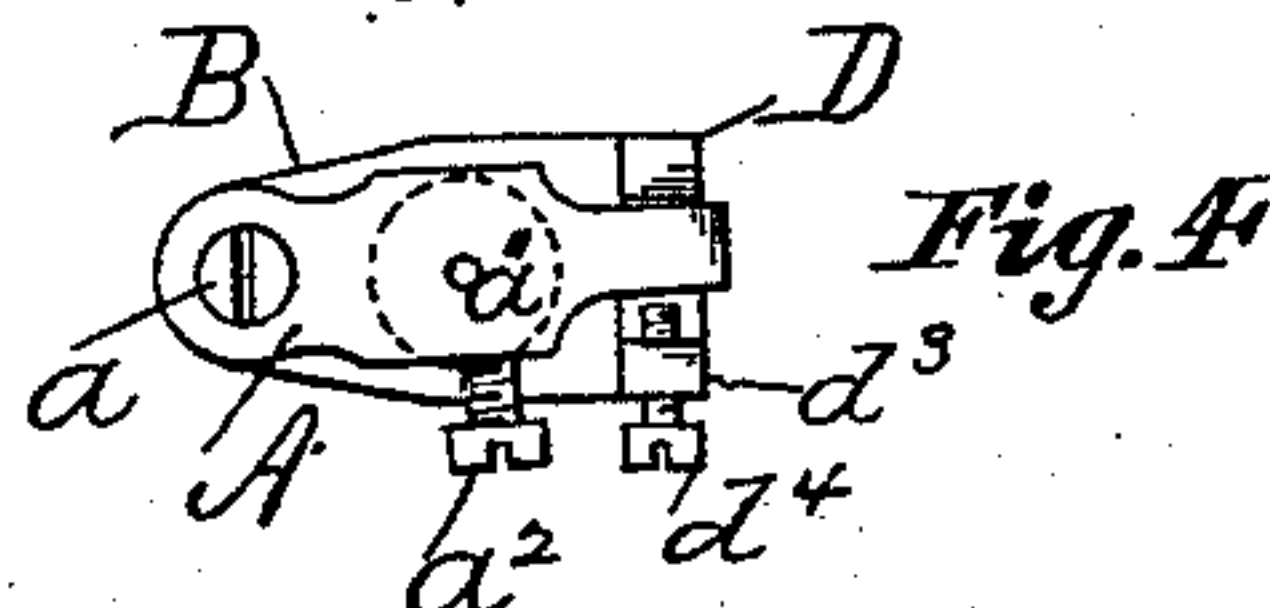


Fig. 4

INVENTOR,

Chas M. Banks.
By Connolly Bros.
ATTORNEYS.

(Model.)

3 Sheets—Sheet 2.

C. M. BANKS.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 286,989.

Patented Oct. 23, 1883.

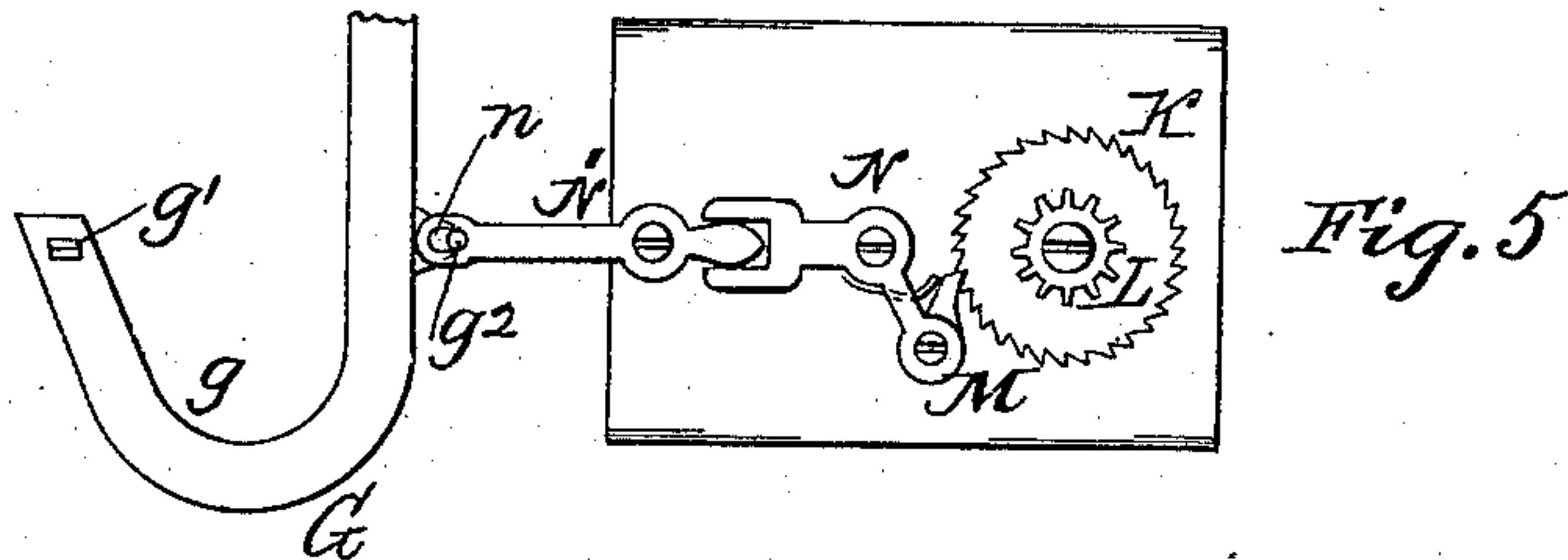


Fig. 5

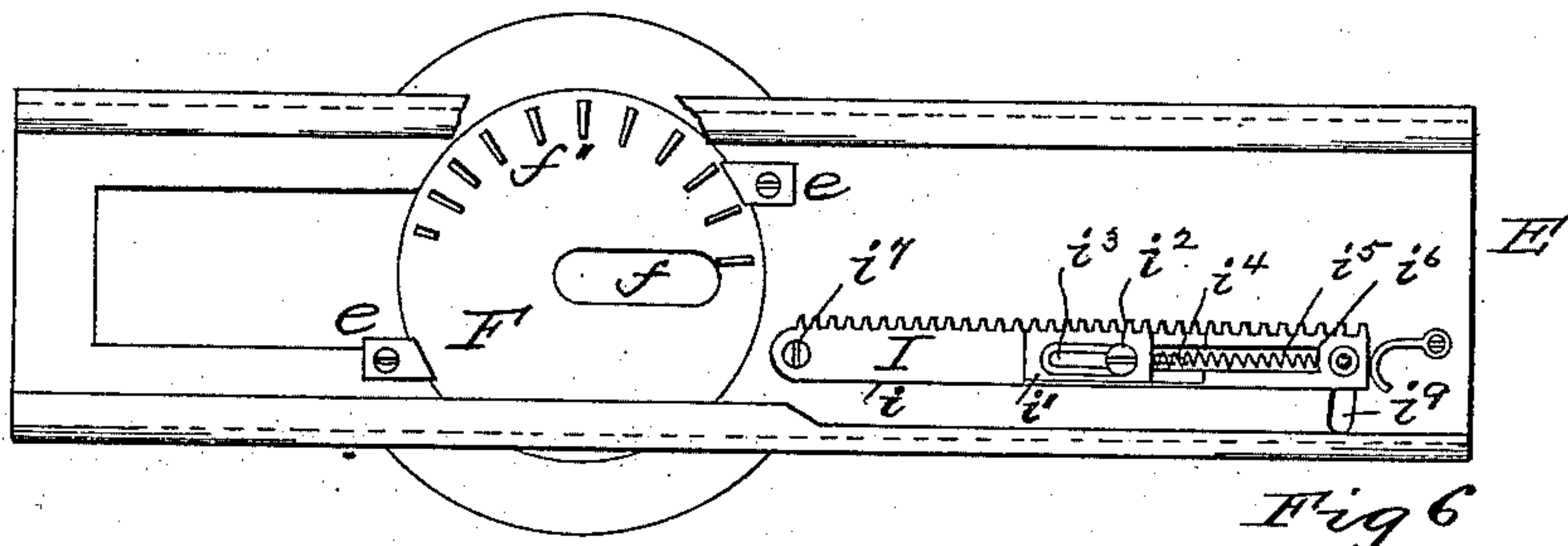


Fig. 6

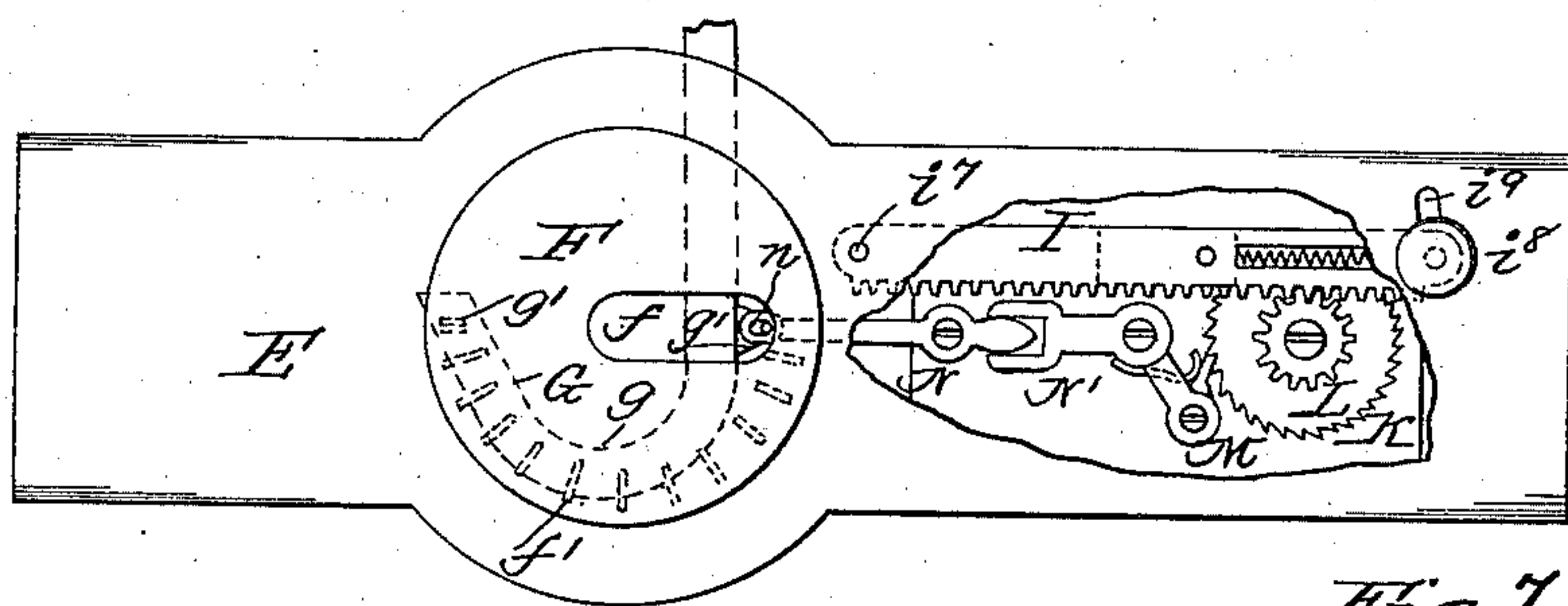


Fig. 7

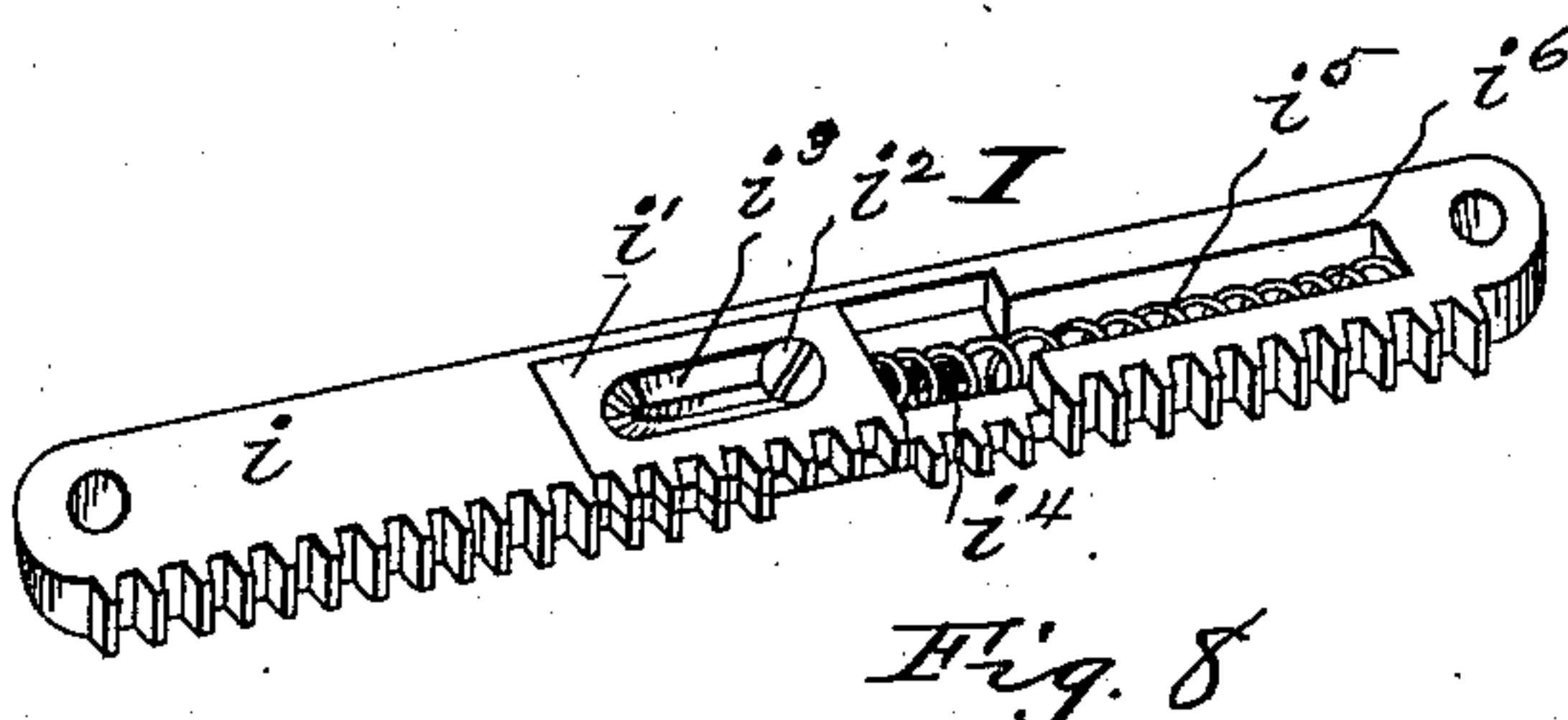


Fig. 8

WITNESSES:

S. J. VanStavoren
Chas. F. Van Horn

INVENTOR,

Chas M. Banks
By Connolly Bros.
ATTORNEYS.

(Model.)

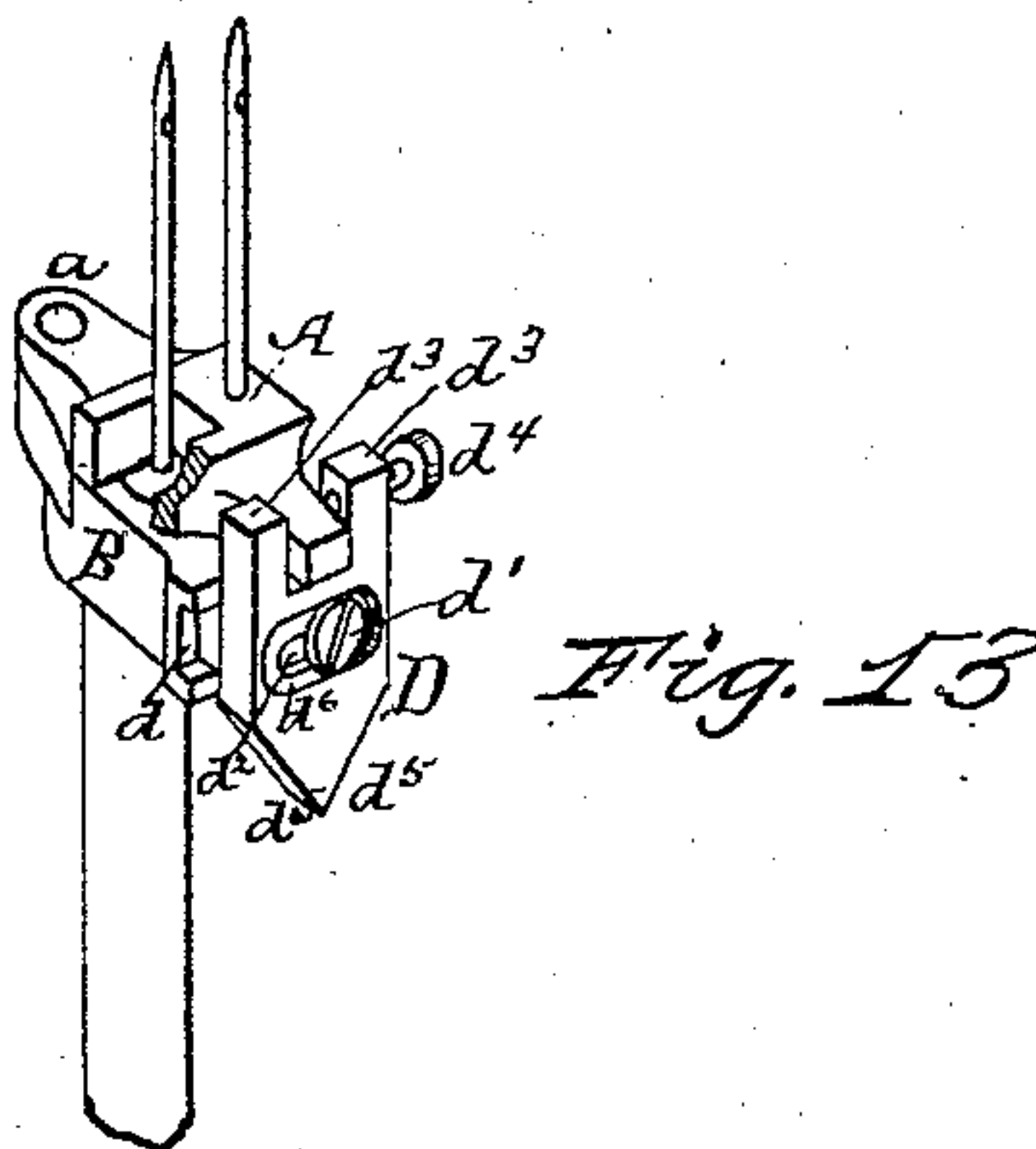
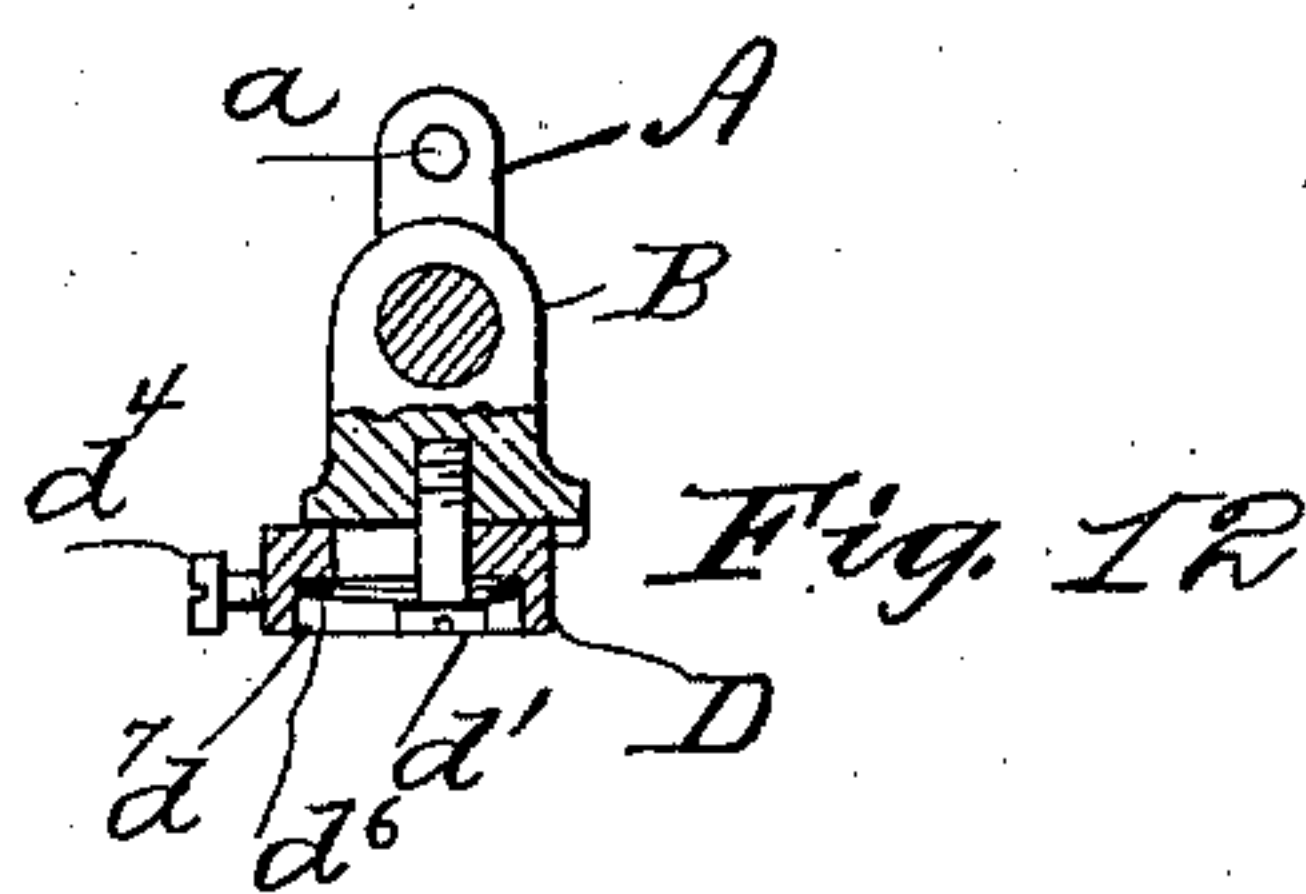
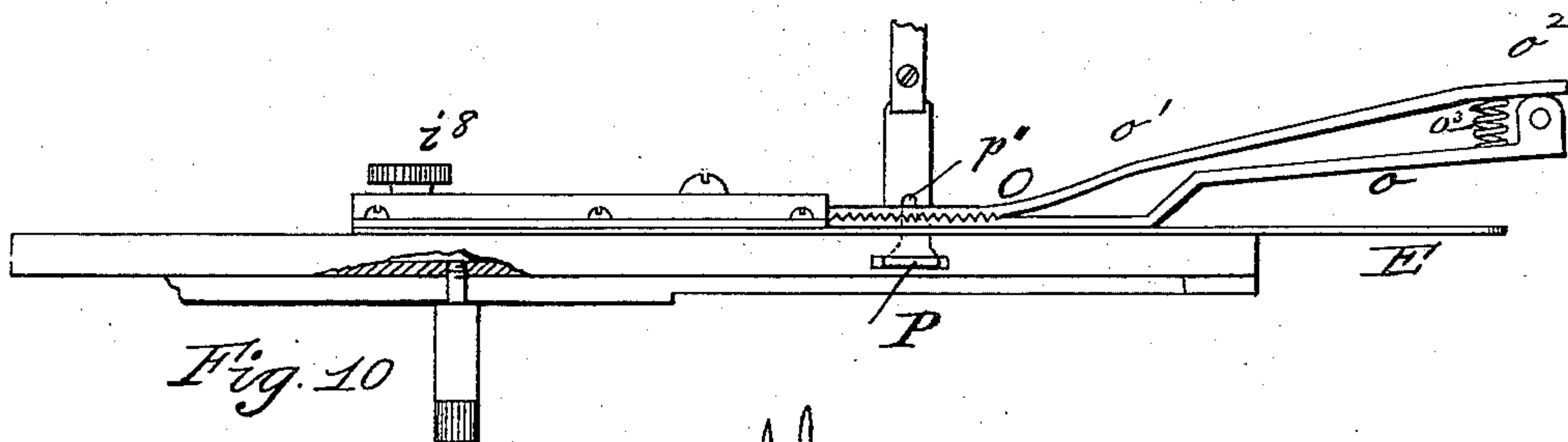
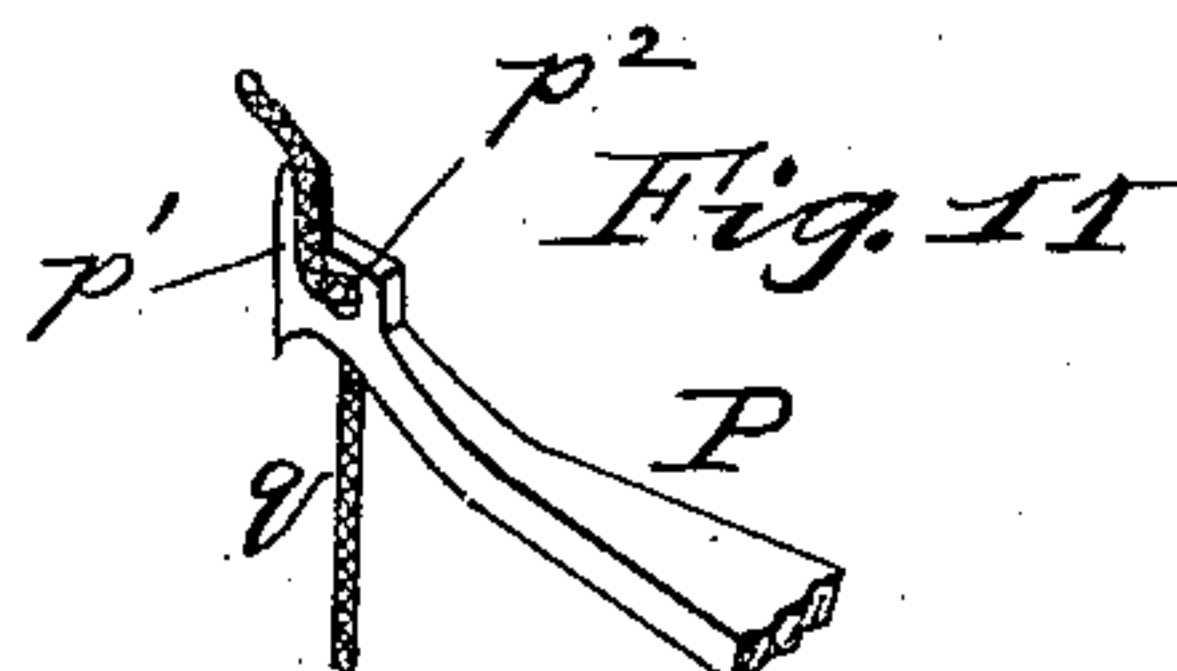
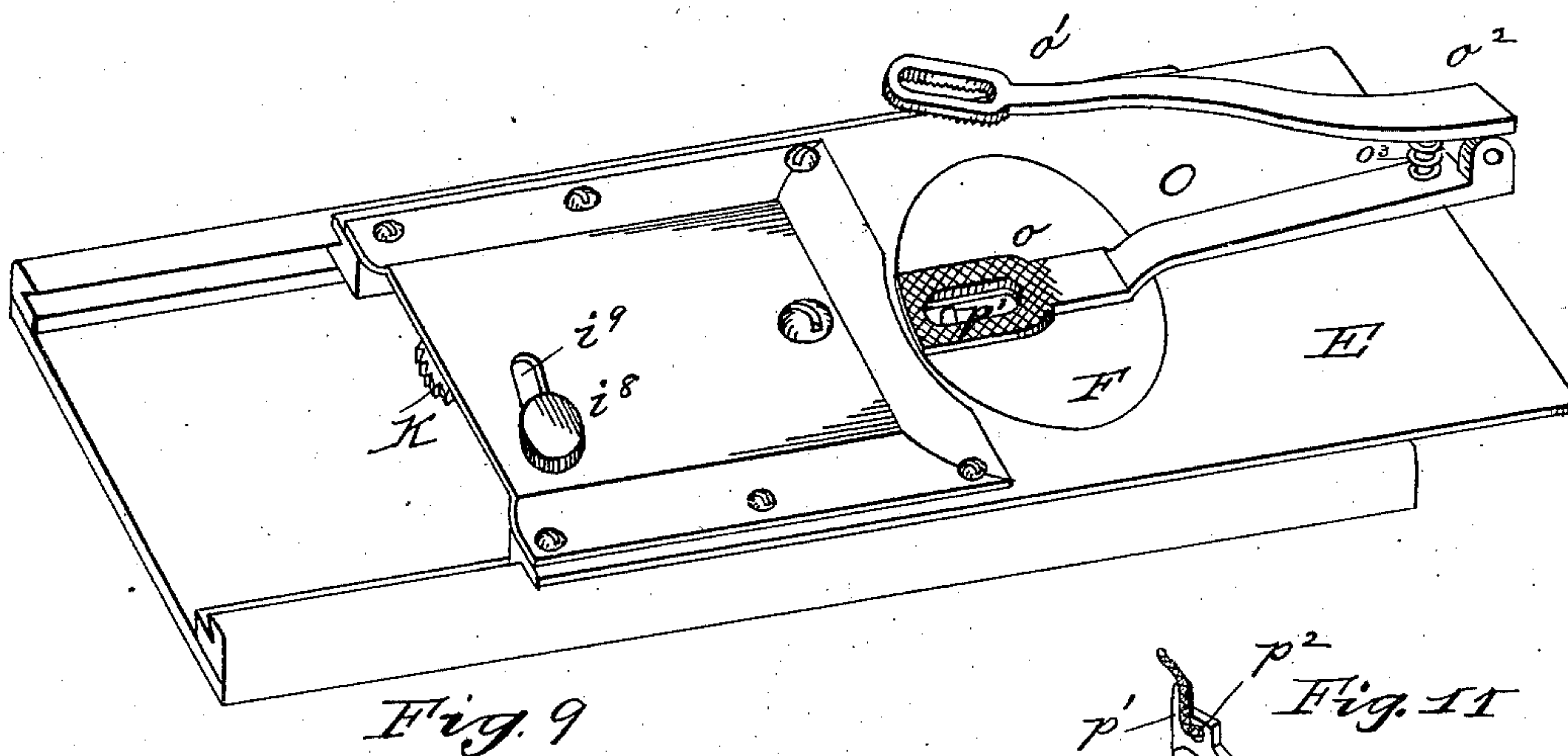
3 Sheets—Sheet 3.

C. M. BANKS.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 286,989.

Patented Oct. 23, 1883.



WITNESSES:
S. J. Vanstavoren
William F. Cook

INVENTOR,
Chas. M. Banks,
By Conolly Bros.,
ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES M. BANKS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY
DIRECT AND MESNE ASSIGNMENTS, TO THE BANKS BUTTON HOLE MA-
CHINE COMPANY, (LIMITED,) OF SAME PLACE.

BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 286,989, dated October 23, 1883.

Application filed November 8, 1881. (Model.)

To all whom it may concern:

Be it known that I, CHARLES M. BANKS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Button-Hole-Stitching Attachments for Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is an elevation, partly in section, of the head of a sewing-machine with my improvements illustrated as applied thereto. Figs. 2, 3, and 4 are detail views of zigzag-stitch mechanism. Fig. 5 is a plan of mechanism for operating ratchet-wheel and pinion secured to the cloth-plate or holder. Fig. 6 is an inverted plan of cloth-carrier, rotary disk, and attached racks. Fig. 7 is a plan of cloth-carrier and mechanism for moving the same. Fig. 8 is a detail perspective of pivoted rack for cloth-carrier. Figs. 9 and 10 are respectively a perspective and side elevation of a slight modification in construction of the cloth plate or carrier. Fig. 11 is a detail perspective; Fig. 12, a detail sectional plan; and Fig. 13, a perspective of the needle-carrier inverted, showing two needles therein.

My invention consists in the peculiar construction and novel combination of parts, hereinafter described, constituting a button-hole-stitching attachment for sewing-machines.

My improvements relate, first, to the means for effecting a reciprocating motion of the needle, and, second, to the devices for effecting the feed of the cloth in the line of the edge of the button-hole.

Referring to the means for effecting the movement of the needle, my improvements consist, essentially, in the provision of a pivoted needle-carrier arranged to vibrate in a horizontal plane, and actuated directly by a sliding cam provided with means for adjusting the throw of said carrier.

Referring to the devices for feeding the cloth in the line of the edge of the button-hole, my improvements consist, essentially, in the com-

bination, with a sliding cloth-carrier provided with a rotary disk, of a rack formed in two sections, one of which is adapted to slide upon the other, and a pinion which engages alternately with said sections, the movement of said carrier and its disk being effected by means of a dog on the feed-bar of the machine, all as hereinafter more fully specified.

Referring to the accompanying drawings, Fig. 2 shows a bracket with vibrating lever, which is attached to the head of the machine, as shown in Fig. 1. This device is constructed as shown and claimed in Letters Patent of the United States dated August 30, 1881, granted to me, (No. 246,450,) and need not here be further described.

In Figs. 3 and 4 A represents a lever pivoted at *a* to a stock, B, which stock is designed to be fastened to the bottom of the needle-bar of the machine by a screw, *b*, as shown in Fig. 1 of the drawings. The needle is fastened in an opening, *a'*, in said lever by a set-screw, *a''*.

D represents a cam fitted by tongue and groove *d* in the face of the stock B, so that it may be reciprocated thereon in a horizontal plane. Said cam is held in place by a screw, *d'*, which enters the stock B, passing through a slot, *d''*. The lower end of the cam D has two depending lugs, *d'''* *d'''*, between which the forward or free end of the lever A projects. There is play-space between said lugs for the end of said lever, the extent of which is regulated by a set-screw, *d⁴*, in one of the lugs *d'''*. If desired, both of said lugs may be provided with set-screws *d⁴*. The upper portion of the cam D is tapered, forming two inclined edges, *d⁵* *d⁵*, which alternately meet opposite sides of the short pivoted lever, (shown in Fig. 2, and more particularly described in Letters Patent above referred to,) thereby causing the cam D to be reciprocated, and the needle-carrying lever A to be vibrated in a horizontal plane as the machine needle-bar ascends and descends, thus producing the desired reciprocating movement of the needle for effecting a button-hole stitch. The head of the screw *d'*, by which the cam D is held on the stock B, bears upon a spring-washer, *d⁶*, of elongated or approximately oval form, which rests in a recess, *d⁷*, in the outer face of said

stock, as shown in Fig. 12. This allows the cam to move without binding, yet steadily.

Referring now to Figs. 1, 5, 6, 7, 8, 9, and 10, E shows a feed-plate or cloth-carrier fitted in guides or ways in the cloth-plate of the machine, so that it may be moved longitudinally thereon. Said feed-plate carries a circular disk, F, fitted in an annular recess in the feed-plate E, and held therein by lugs *e e*, so that the surfaces of both shall be flush and the disk capable of rotation in the plate. Said disk is formed with a button-hole slot, *f*, and also on its under side with a semi-annular rack, *f'*.

G represents a pawl or dog of the peculiar shape shown, consisting of a curved arm, *g*, with tooth *g'* near its outer end. Said dog is fastened to and partakes of the movement of the feed-bar H of the machine, which feed-bar has the ordinary "four motion." The tooth *g'* engages with the teeth of the annular rack *f'*, as hereinafter described.

I represents a rack secured to the underside of the plate E. Said rack is formed in two sections, *i* and *i'*. The section *i* is rigidly secured to the plate E, while the section *i'* is secured on the section *i* by a screw, *i²*, passing through a slot, *i³*. Section *i'* has also a stem, *i⁴*, provided with an encircling spiral spring, *i⁵*, which stem and spring rest, as shown, in a recess, *i⁶*, on the upper side of the section *i*. By means of this construction the section *i'* is capable of being slid on section *i*, and is so moved, as hereinafter set forth. Both sections *i* and *i'* have rack-teeth, several of those of section *i* being removed at a point directly beneath section *i'*, for a purpose hereinafter set forth.

K represents a ratchet-wheel, and L a pinion on the same shaft, which meshes with the teeth of the rack I. Said ratchet is moved by a pawl, M, which in turn receives movement through the interlocking levers N N' from the feed-dog G, a side tooth, *g²*, on said dog entering an opening, *n*, in the end of said lever. The rack I is pivoted at one end, as shown at *i⁷*, and is provided at the other with a set-screw, *i⁸*, which passes through a segmental slot, *i⁹*, in the plate E. By these means said rack may be swung into and held in engagement with the pinion L and released therefrom, as hereinafter specified.

O represents a cloth-holder, consisting of two arms, *o* and *o'*, pivoted at *o²*, and there provided with a spring, *o³*, which tends to separate them. The arm *o* is rigidly secured to the rotary disk F, while the arm *o'* passes under the presser-foot and operates, when said foot is down upon it, as shown in Fig. 1, to hold the cloth between it and the arm *o*, whereby such cloth is moved with the feed-plate and rotary disk. The arms *o o'* are broadened at the end under the presser-foot, and have a button-hole slot formed in each of them, which registers with the similar slot, *f*, in the rotary disk F.

The operation is as follows: The feed-plate

or cloth-carrier being drawn back or inwardly and the rack I swung over and secured, so that the parts will occupy the relative position shown in Fig. 7, the cloth to be stitched is adjusted in the holder with the button-hole slit in coincidence with the slot *f* in the rotary disk F. The machine being started, the pinion L moves the rack I, engaging with the rigid section thereof, and causes the feed-plate or cloth-carrier E to slide lengthwise until one side of the button-hole, or from the starting end up to the eye, has been stitched. By this time the plate or carrier E has been moved far enough for the first tooth of the semi-annular or segmental rack *f'* on the disk F to come into line with the tooth *g'* of the pawl or dog G. An engagement of said tooth and segmental rack now occurs, and the rotary disk is thereby made to rotate half-way around when such engagement ceases, by reason of the pawl-tooth *g'* passing the last tooth of the rack *f'*. While this half-rotation of the disk is transpiring the feed-plate or carrier E is not moving, as during such time the pinion L is in mesh with and moving the sliding rack *i'* and compressing the spring *i⁵*, being out of engagement with the rack *i* by reason of the mutilation or absence of teeth of the latter, as already specified; but as soon as a half-rotation of the disk has been accomplished the pinion L again comes into engagement with the rigid section of the rack I, and again moves the feed-plate in the same direction as before until the end of said rack is reached. Though the plate E now moves in the same direction as before, yet, as the cloth has been turned around with the disk F when the latter was semi-rotated, as described, the stitching now proceeds down the other side of the button-hole to the finishing end—i. e., the end from which the start was made. After the button-hole is finished and the cloth removed, the disk F is rotated half-way around and the feed-plate slid back to its normal position, the rack being thrown out of engagement with the pinion L after loosening the set-screw *i⁸*, the spring *i⁵* serving to bring back the rack-section *i'* to its original place.

If desired, two needles may be employed, one in the needle-bar of the machine proper and the other in the needle-carrier, as shown in Fig. 13. If a cord be passed through the opening *p²* and laid on the edge of the button-hole, so as to be crossed by the zigzag stitch, the button-hole will be corded.

P represents a bar secured to the bed of the machine below the cloth-plate, as at *p*. It extends laterally, and proceeds half-way across the throat or slot *f'*, terminating in a finger, *p'*, which projects upwardly through said slot. This finger forms a divider, which separates the edges of the slit in the cloth which is to be stitched, to form the button-hole. Beside the base of the finger there is formed in the bar P an opening, *p³*, for the passage of a cord, *q*, (shown in Fig. 11,) coming from a suitably-

located spool. (Not shown in the drawings.) This is to provide for cording the button-hole, if so desired.

What I claim as my invention is as follows:

5 1. The combination, with stock B and lever A, pivoted thereon, of a sliding cam, D, secured on said stock and engaging with said lever, substantially as shown, whereby, when said slide is reciprocated, said lever will be
10 vibrated on said stock, as specified.

2. The combination, with stock B and pivoted lever A, of slide D, having depending lugs d^3 d^3 , one of said lugs carrying a set-screw, d^4 , for limiting the vibration of said lever, substantially as shown and described.
15

3. The combination, with feed-plate E, of rack I, formed in two sections, i and i' , the latter being adapted to slide on the former, and having a spring, i^5 , substantially as shown
20 and described.

4. The combination, with feed-plate E, of rack I, formed in two sections, i and i' , and pivoted at one end, whereby, when the pinion L has traversed the teeth of both sections, said

rack may be swung out of engagement there- 25 with, substantially as shown and described.

5. The combination of feed-plate E, having rack I, pawl and ratchet K M, and pinion L, with feed-dog G and levers N N', substantially as shown and described.
30

6. The combination of feed-plate E and rotary disk F, having racks f' I, with feed-bar H, dog G, pawl and ratchet K M, pinion L, and levers N N', substantially as described, whereby the feed-plate and rotary disk are
35 moved together when the edges of the button-hole are being stitched, while said feed-plate is held stationary and the disk caused to rotate when the end of the button-hole is being stitched, substantially as shown and described.
40

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of November, 1881.

CHARLES M. BANKS.

Witnesses:

S. J. VAN STAVOREN,
CHAS. F. VAN HORN.