

(No Model.)

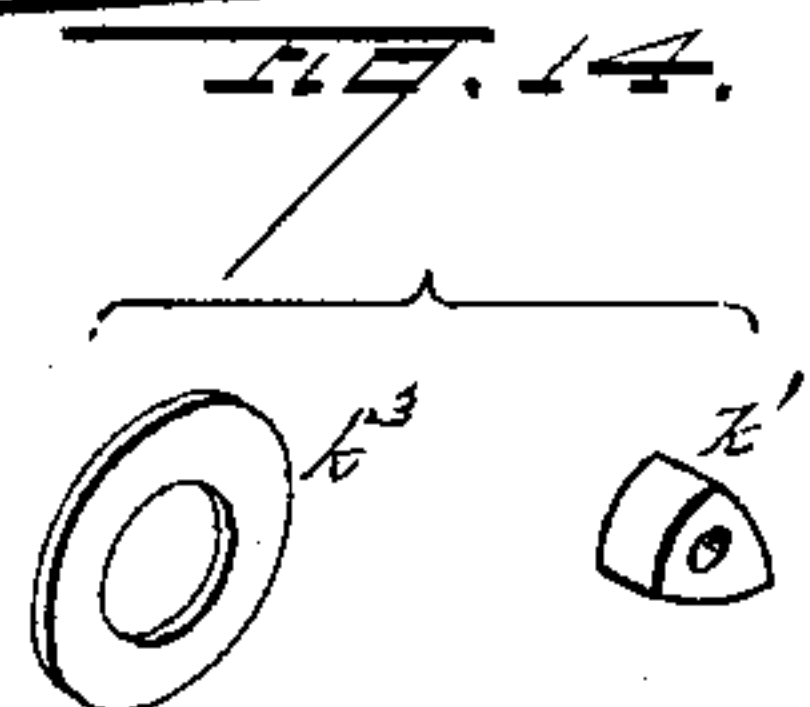
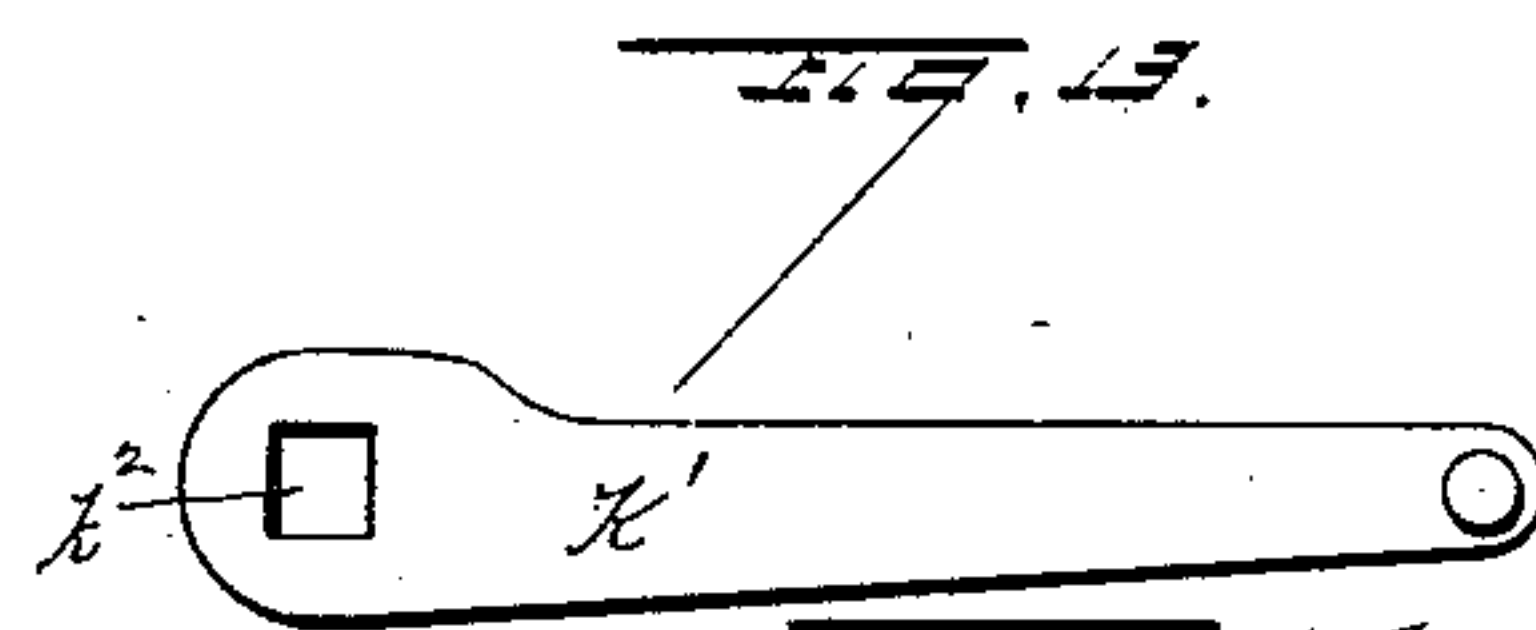
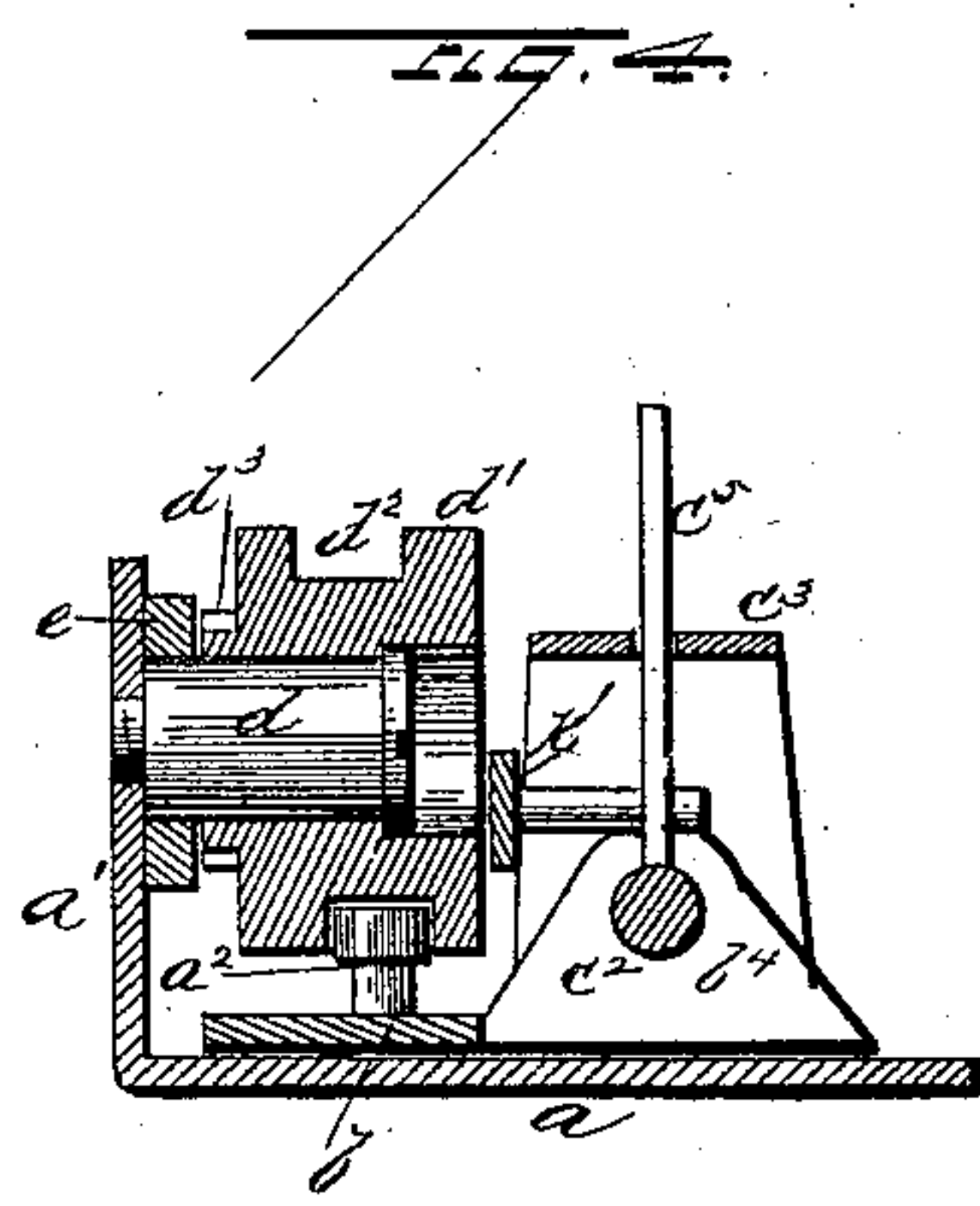
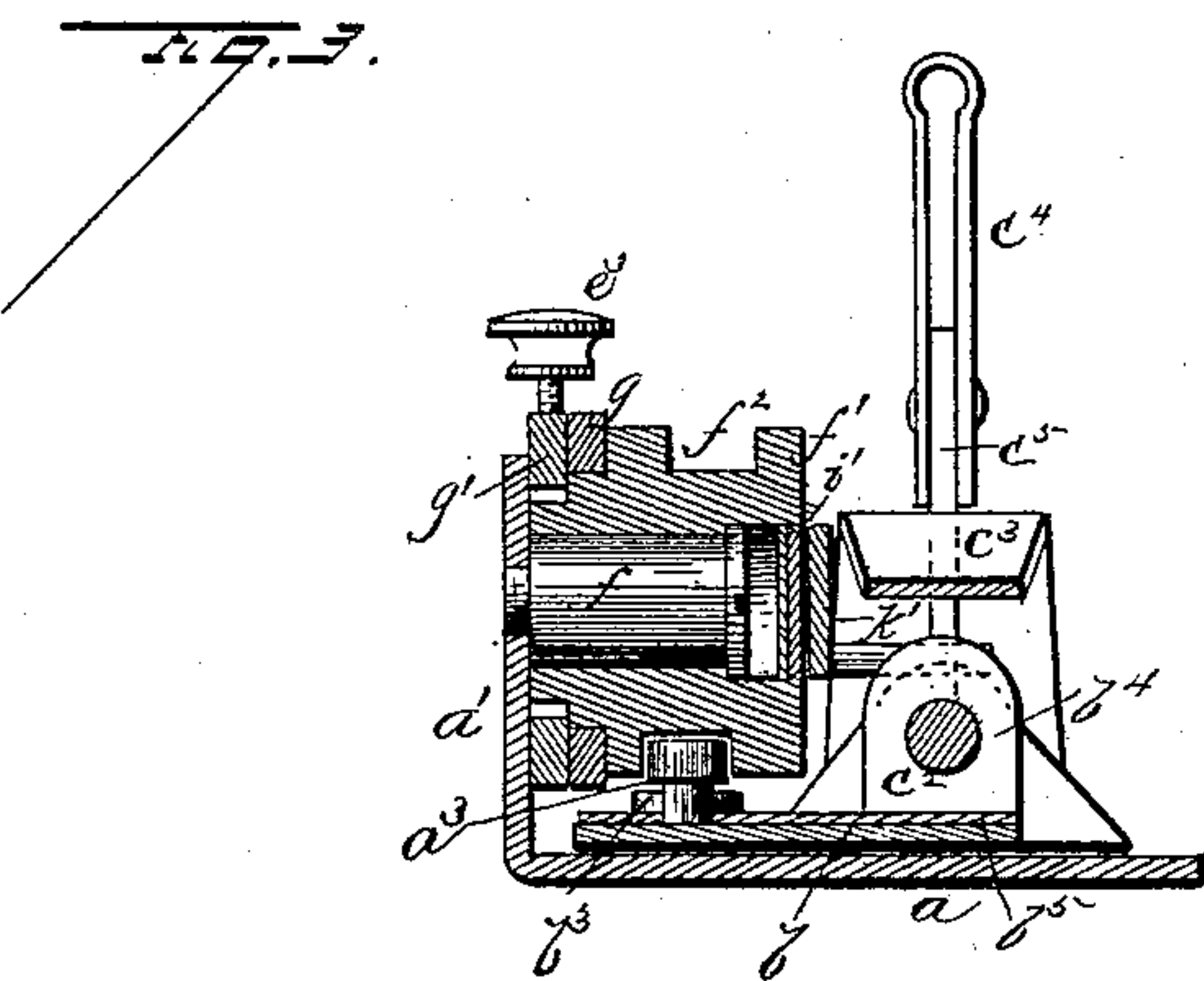
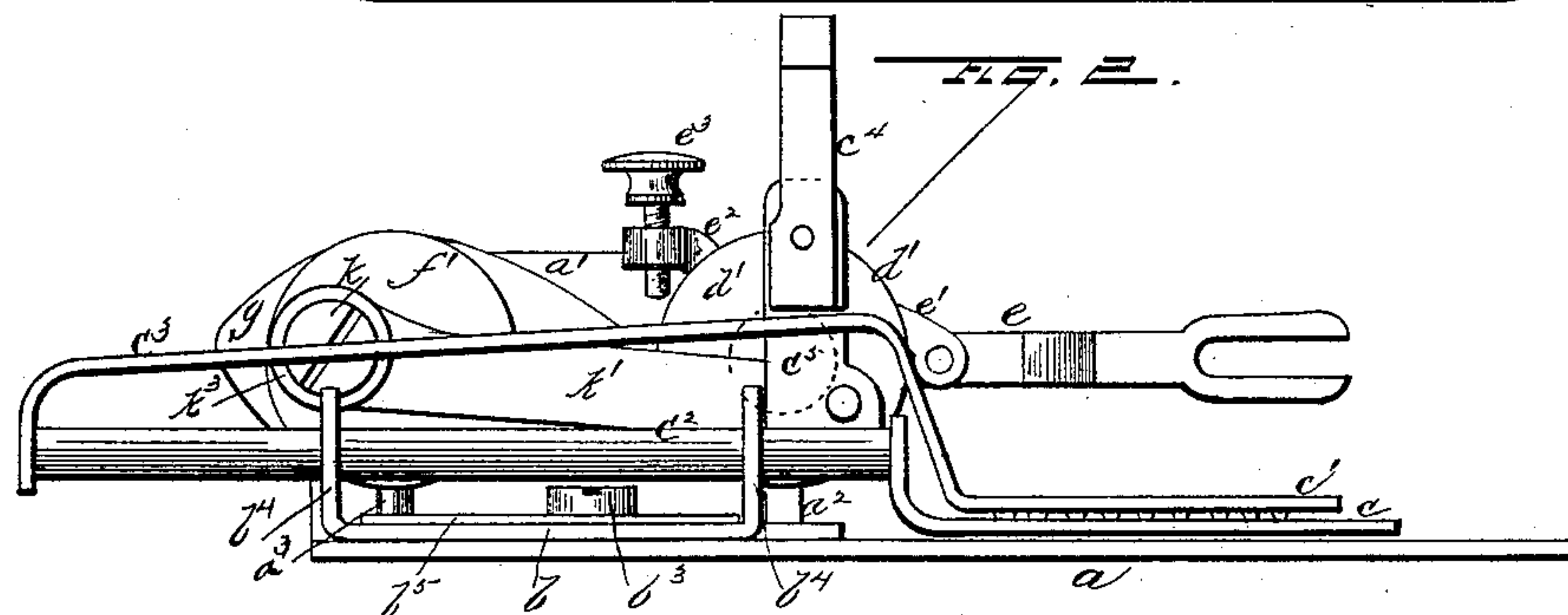
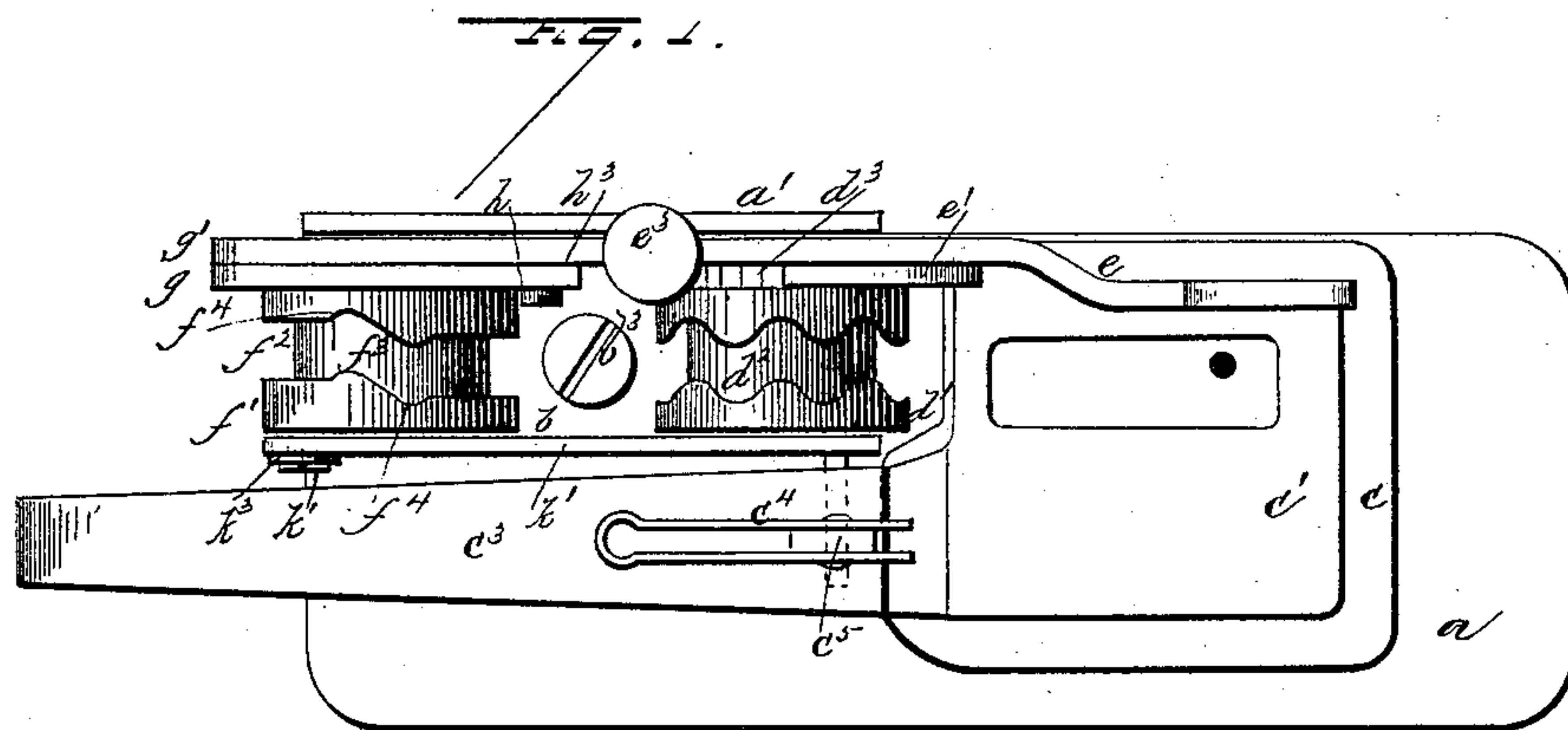
3 Sheets—Sheet 1.

J. W. BLODGETT.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 366,616.

Patented July 12, 1887.



Witnesses:

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Inventor.

John W. Blodgett

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Attorney.

(No Model.)

3 Sheets—Sheet 2.

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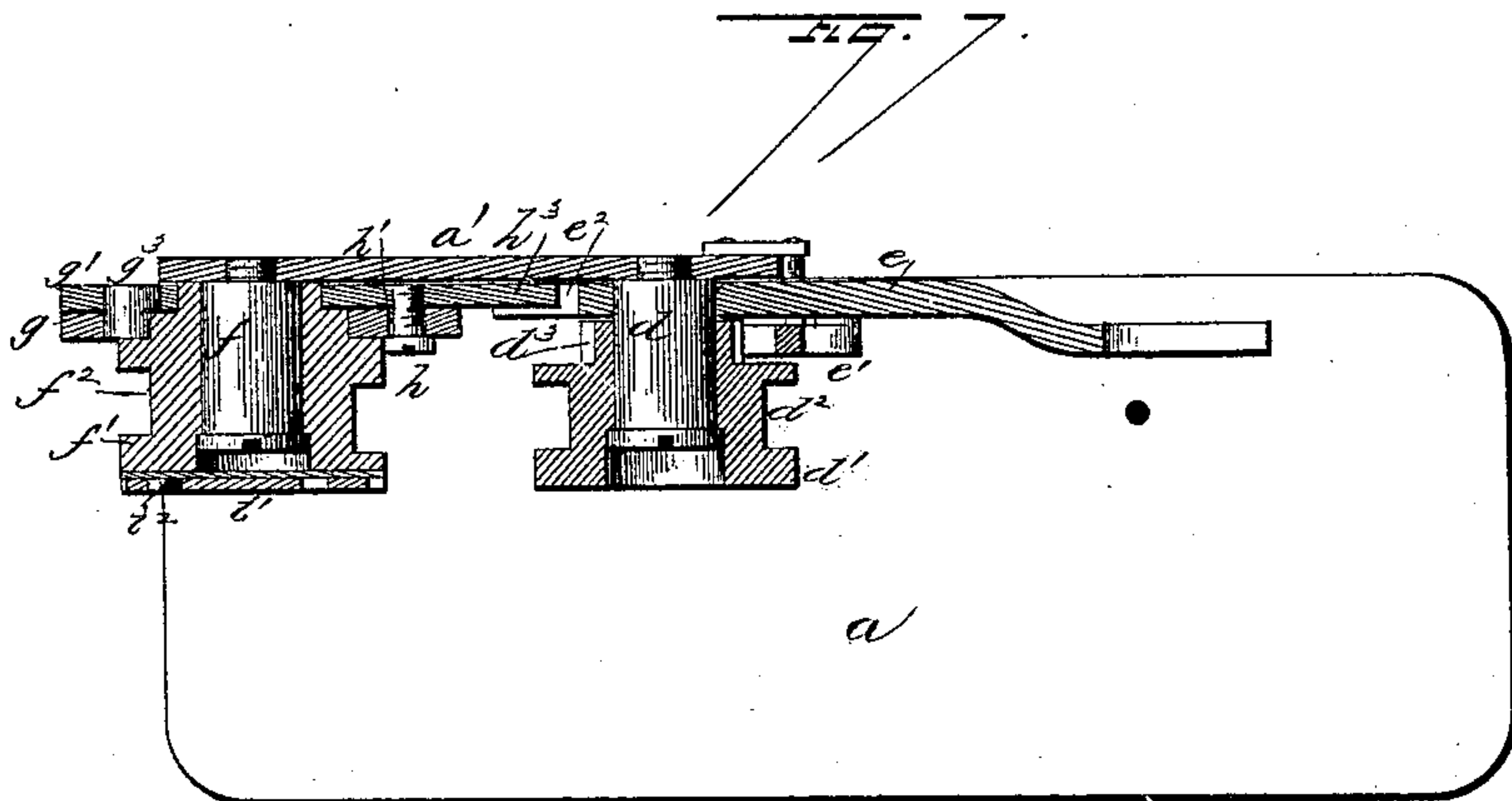
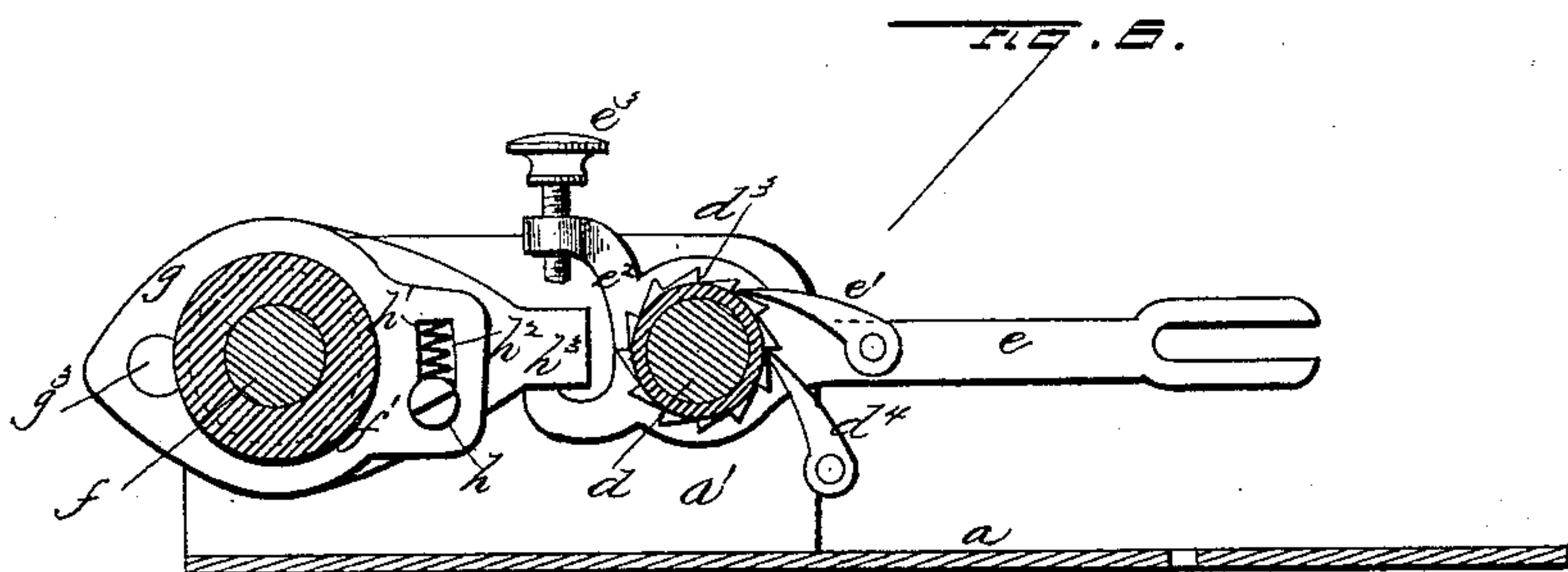
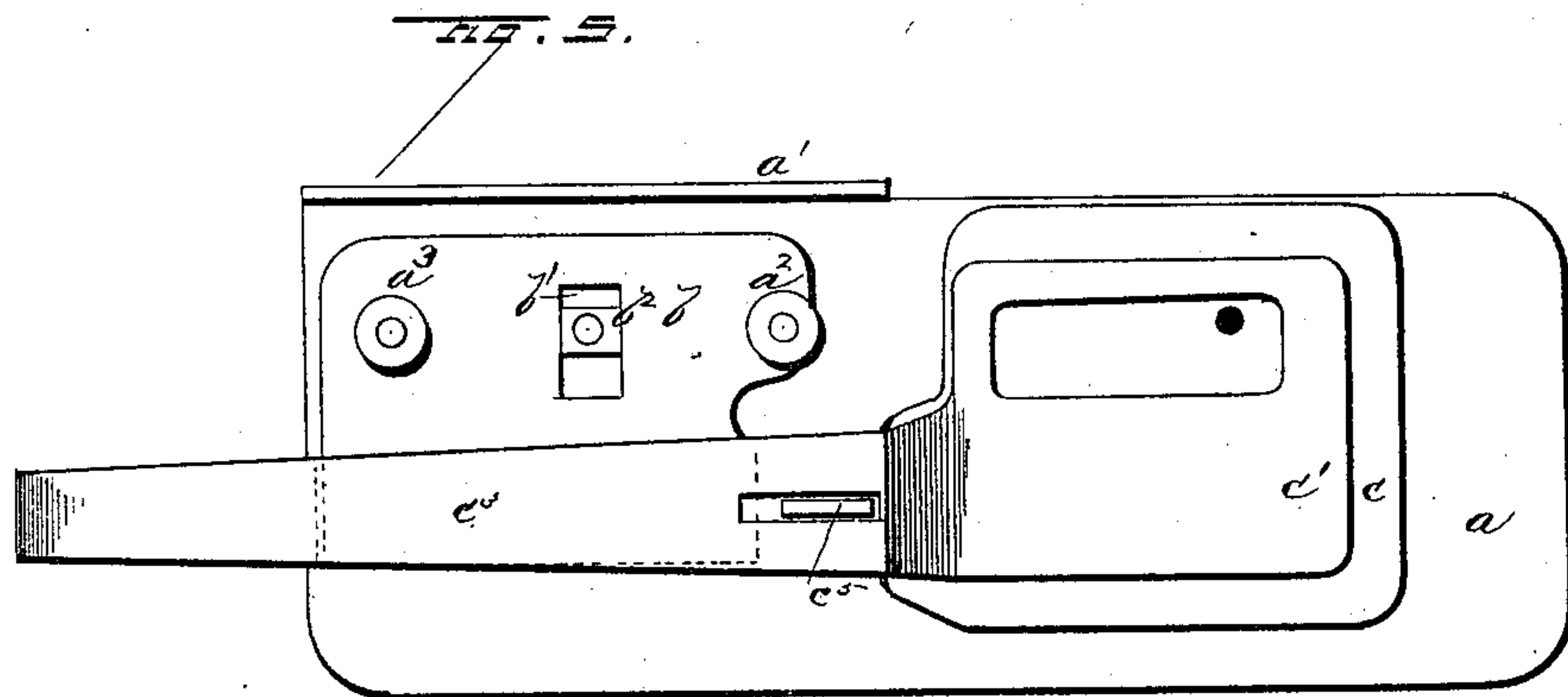


FIG. 8.

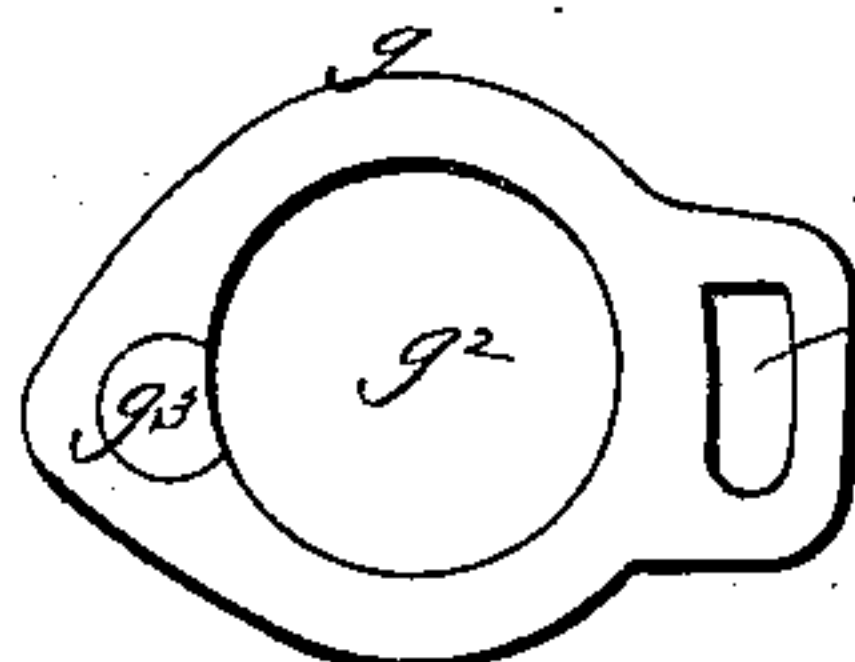


FIG. 9.

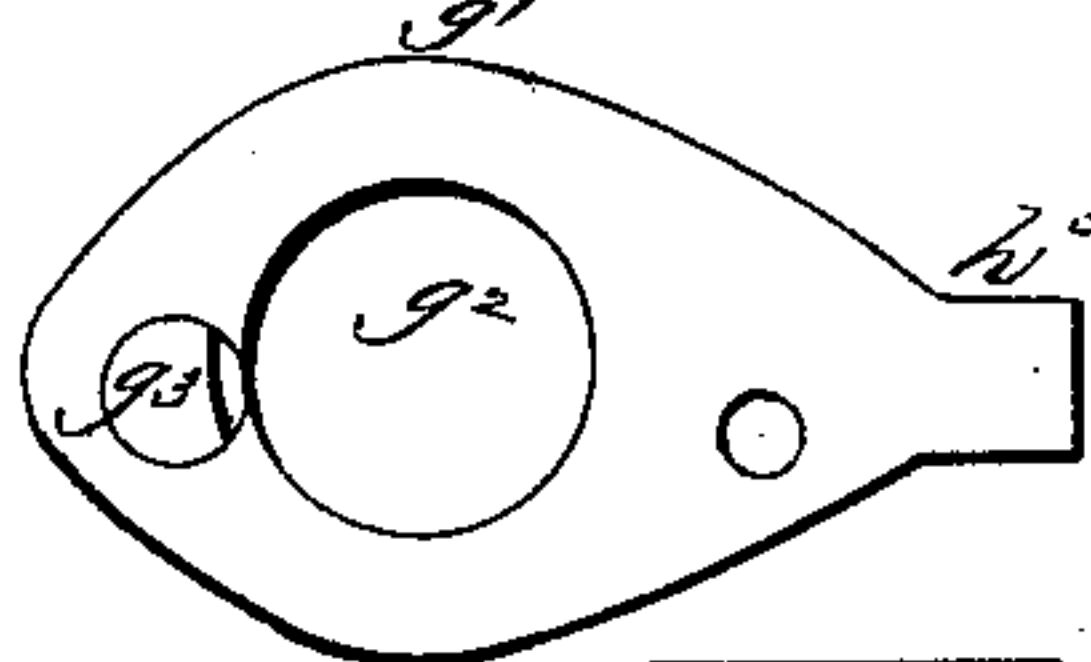


FIG. 10.

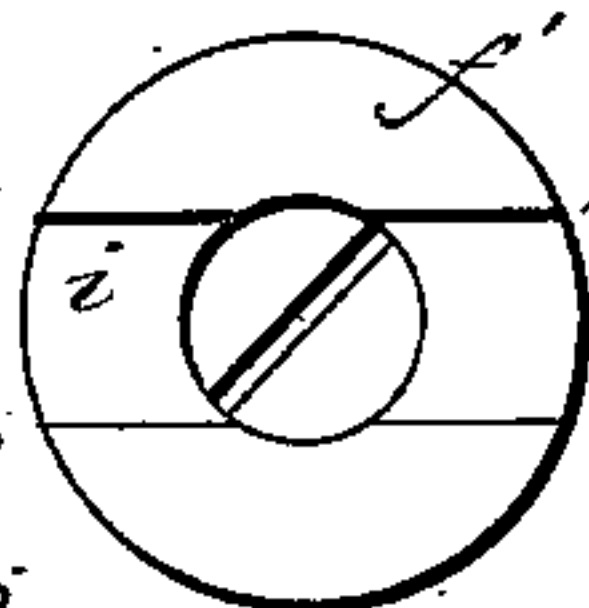


FIG. 11.

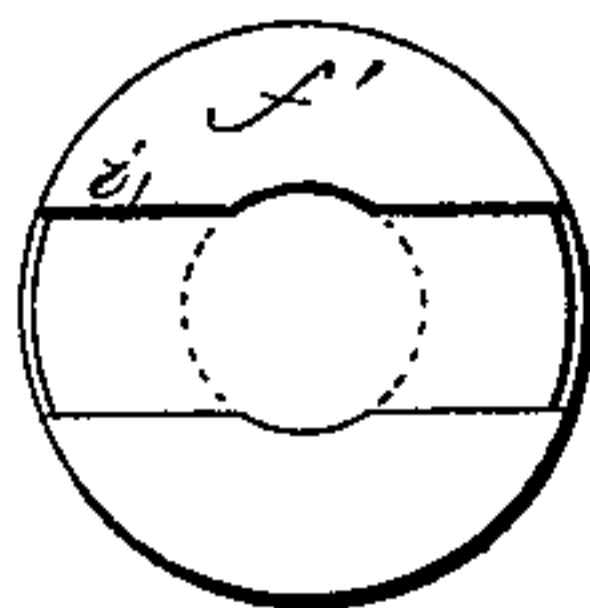
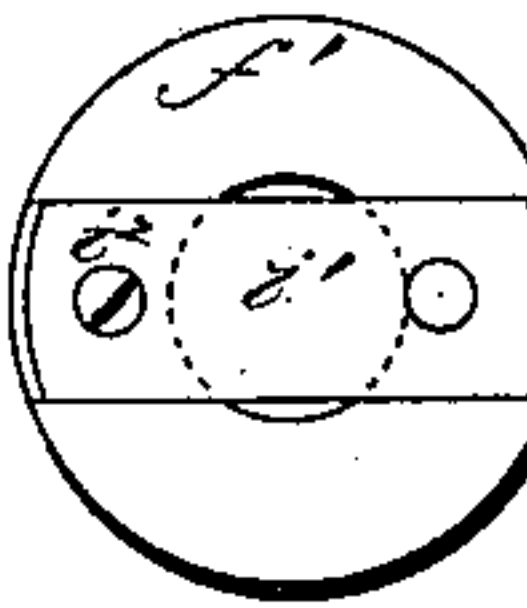


FIG. 12.



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3 Sheets—Sheet 3.

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Fig. 16.

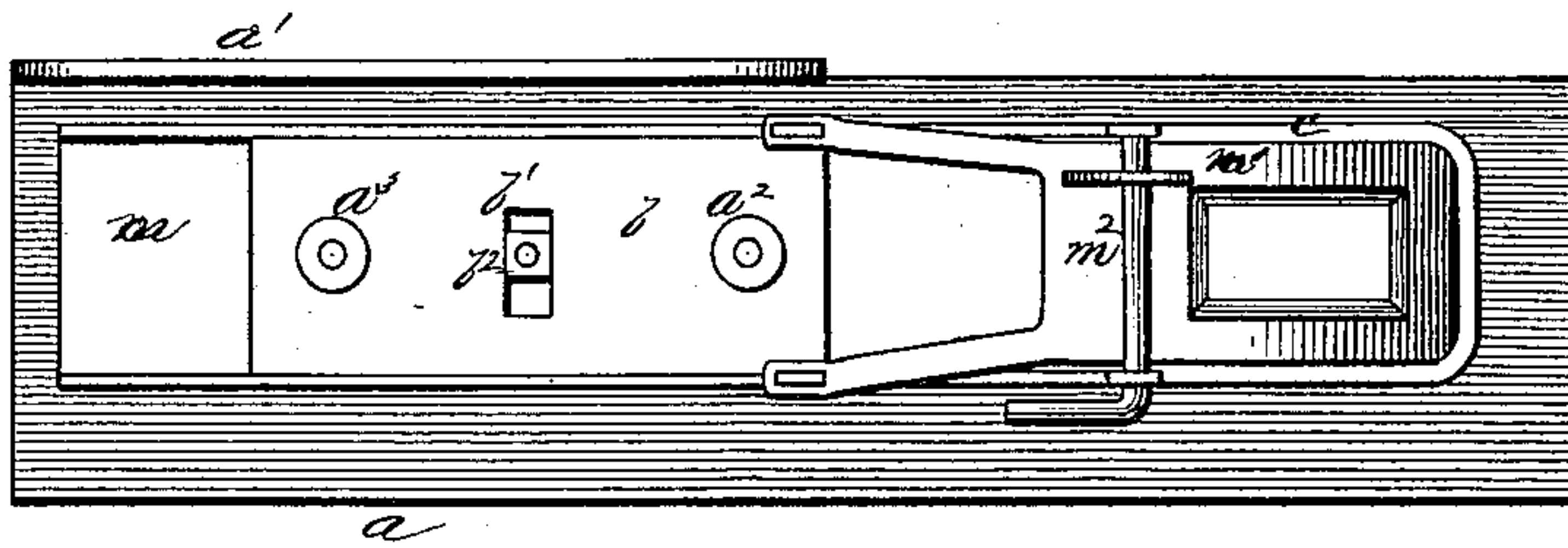


Fig. 16.

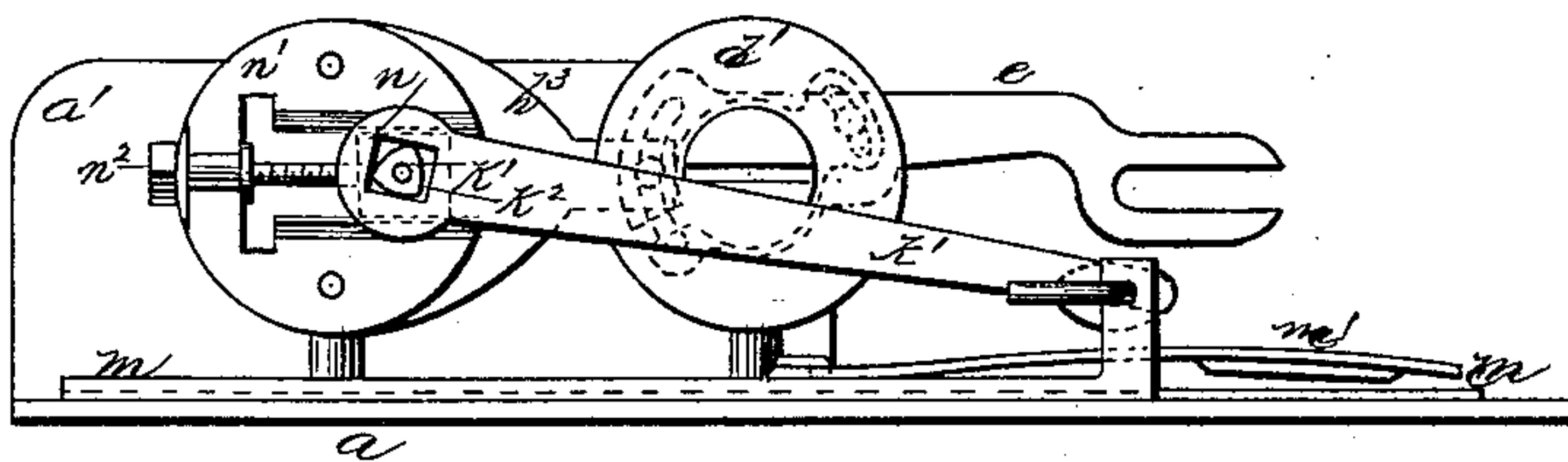
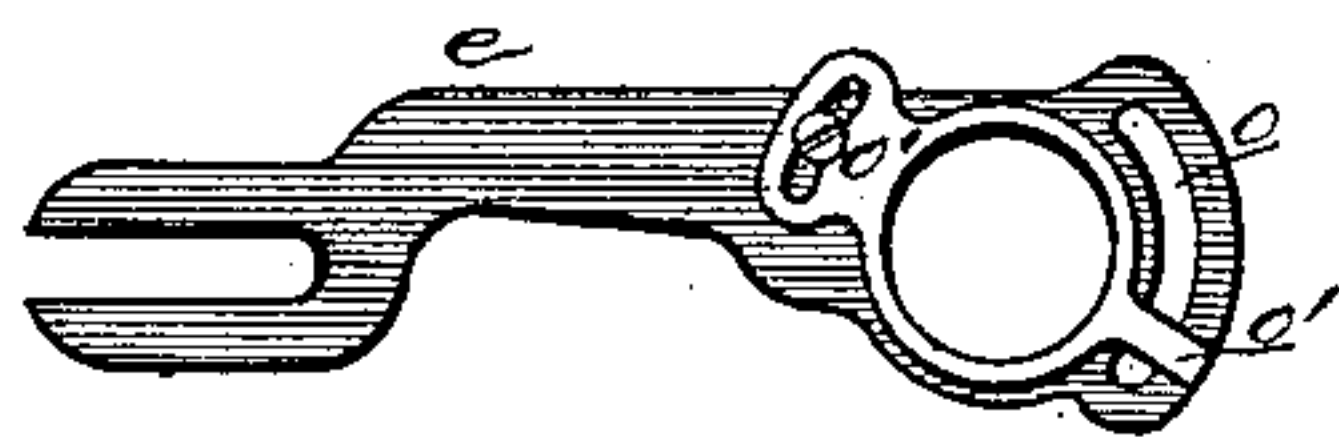


Fig. 17.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN W. BLODGETT, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE MOORE
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BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 356,616, dated July 12, 1887.

Application filed December 18, 1886. Serial No. 222,021. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. BLODGETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Button-Hole Attachments for Sewing-Machines, of which the following is a specification, to wit:

This invention relates to an improvement in automatic button-hole attachments for sewing-machines; and it consists in certain novel peculiarities of the construction and arrangement of the same, substantially as will be hereinafter more fully set forth and claimed.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a top plan view of my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a transverse section upon the line *xx*, Fig. 1; Fig. 4, a similar view upon the line *ww*, Fig. 1. Fig. 5 is a detail plan view of the bed-plate and the cloth-clamp. Fig. 6 is a longitudinal section upon the line *yy*, Fig. 1. Fig. 7 is a horizontal section upon the line *zz*, Fig. 2. Figs. 8 and 9 are detail views of the clutch-plates. Figs. 10, 11, and 12 are end views of the clutch or shifting cylinder, showing different portions of its attachments. Fig. 13 is a view of the pitman for actuating the cloth-clamp, and Fig. 14 represents the wrist-pin used with this pitman and the washer that is used with it. Figs. 15, 16, and 17 are modifications.

a represents the bed-plate of my attachment, either provided or formed with a vertical part, *a'*, upon which the shifting and oscillating mechanism is carried. Upon the bed-plate is secured the cloth-clamp guide *b*, which consists of a flat plate formed with a transverse slot, *b'*, as in Fig. 5, in which is a block, *b²*, and a screw, *b³*, passed through this block into the bed-plate, serves to confine the guide *b* in place without clamping it, so as to interfere with its motion. The outer side of this guide is U-shaped, being formed with up-
turned arms *b⁴*, to serve as bearings for the

shank of the cloth-clamp proper, as will be hereinafter described. It is important that while the guide should be secured against any longitudinal motion upon the bed-plate it should yet be free to move laterally, as required in the operation of the machine, and by reference to Fig. 5 it will be at once noticed that while the boxing *b²* fills the slot *b'* in one direction, thus securing the guide against motion in that way; but in the opposite direction, or transversely of the bed-plate, the length of the slot gives the guide a freedom of movement, as will be evident. To properly retain the guide in position and aid its proper operation, I place over it a spring-plate, *b⁵*, held down by the retaining-screw *b³*, as seen in Figs. 2 and 3.

The cloth-clamp proper consists of two plates, *c c'*, between which the material is firmly held, and by which it is moved. To the lower plate, *c*, is secured a shank, *c²*, which passes through and is freely moved in the upturned arms *b⁴* of the guide; and the upper plate, *c'*, of the clamp is formed or provided with a spring-arm, *c³*, which passes back over the other, and the spring-arm and shank are secured together at their rear ends, as in Fig. 2. This spring-arm acts to hold the upper plate away from the lower, and the two are pressed together by means of an eccentric lever, *c⁴*, pivoted upon a short standard, *c⁵*, rising from the shank *c²*, and bearing upon the spring-arm, as will be fully understood by reference to the drawings. The inner side of the cloth-clamp guide is provided with two studs, *a² a³*, one upon each side of the retaining-slot *b'*, and for perfection of operation each of these studs is provided with a small friction-roller, as illustrated.

Secured upon a suitable stud, *d*, projecting from the face of the vertical part *a'* of the bed-plate, is the oscillator-wheel *d'*, which is formed upon its periphery with a cam-groove, *d²*, which engages the stud and roller *a²* upon the guide, to give it and its cloth-clamp the oscillating motion necessary to the proper working of the edge of a button-hole. This oscillator-wheel is also formed or provided with a series of ratchet-teeth, *d³*, in order that it may be fed forward, and a stop-pawl, *d⁴*,

supported upon the part a' of the bed-plate, engages this ratchet to prevent any backward movement of the oscillator-wheel.

Upon the stud d is also mounted the main operating-lever e , slotted at its forward end for attachment with the needle-bar of a sewing-machine in the manner these attachments are usually operated. This lever e is provided with a pawl, e' , to engage and feed forward the oscillator-wheel, and is extended in rear of its pivotal point and forked, as at e^2 , one arm of the fork being provided with a thumb-screw, e^3 , which is turned to project a longer or shorter distance within the fork, according to the conditions of the work in hand, and as will be more particularly explained hereinafter.

Upon a second stud, f , also secured in the part a' of the bed-plate, is placed the feeding and shifting cylinder f' , in which is formed a peripheral groove, f^2 , having two straight portions and two inclined or cam portions, f^3 , as shown. This groove engages and moves the stud and roller a^3 upon the cloth-clamp guide to shift this guide and its clamp from side to side in the proper working of first one side and then the other of the button-hole slit, the straight parts of the groove f^2 holding the edges of the slit true and properly under the action of the needle, and the inclined portions of the groove serving to shift the slit from one side to the other at the ends. This groove is sufficient, as described, for ordinary button-holes; but in cases where an eyelet is to be worked at one or both ends of the slit I form the cam part of the groove (either one or both, as may be required) with a small depression, f^4 , at each end, as shown in Fig. 1, to accomplish this object.

Upon the inner end of the feeding and shifting cylinder I place a friction feeding-clutch, consisting of a pair of plates, g g' , both formed with a central opening, g^2 . The plate g fits closely upon the cylinder, or upon a shouldered part of the same, while the second plate, g' , is either made sufficiently large or the cylinder turned down, as shown, so that the plate may have a free motion without touching the cylinder, as will be presently understood. These two plates are connected upon one side by a pin, g^3 , which is rigidly secured in the second plate, and passes loosely through the edge of the central opening of the other, as in Figs. 7 and 9, and the pin is cut away upon one side, as shown, to exactly correspond with the opening through whose edge it passes. Upon the other side the plates are connected by a pin or screw, h , in the plate g' , passing through a slot, h' , in the other, and a spring, h^2 , is placed in said slot to retain the plates normally in their proper position relative to each other, and to move them together in the backward stroke of the clutch. The second plate, g' , also projects forward, as at h^3 , between the prongs of the forked end e^2 of the main operating-lever, as

in Fig. 6, in order that this lever may move the clutch. When the extended end of the second plate, g' , is depressed, the first action will be to turn the pin g^3 till it pinches the cylinder firmly between itself and the opposite side of the opening in the first plate, g , and the two plates and cylinder then move together to the end of the stroke. When the stroke is reversed, the initial movement releases the clutch, and then the spring h^2 carries both plates back together, in readiness for a new feed. By a reference to Fig. 6 it will be seen that this motion of the clutch is induced by one or the other of the prongs of the forked operating-lever, and that the extent of stroke is easily regulated by means of the screw in said fork, which is turned in or out, so that the operative contact of the lever and clutch shall occur sooner or later in the stroke of the main lever. From this description it will be at once seen that the second plate, g' , of the clutch is in reality only a lever for operating the clutch-pin, and need not necessarily be constructed, as is herein shown, to completely encircle the cylinder, but may take any form found suitable or desirable.

As will be fully seen in Figs. 3, 7, 10, 11, and 12, the outer end of the feeding and shifting cylinder is formed with a transverse groove, i , in which I place a dovetailed slide, i' , provided with a set screw, i^2 , to secure it at any particular point in the groove. This slide is also formed with a hole to receive the wrist-pin k , which is connected by a pitman, k' , with the longitudinally-sliding cloth-clamp to feed it forward and back. As the extent of feed of this clamp must be regulated to correspond with the length of the button-hole, the sliding plate i' is moved in its groove to throw the wrist-pin to or from the center of the feeding-cylinder, and this will be readily understood from the drawings.

Like all crank-and-pitman devices, the center of the stroke will be given a greater motion than its ends, and to obviate this I form the pitman with a square opening, k^2 , and make the wrist-pin, as in Fig. 14, in the form of a three-sided cam, and it will be at once seen that this gives the pitman a slight slip at the center of the stroke and a similar slight acceleration at the ends as the points and sides of the cam wrist-pin are successively brought into play, and by this means the regular and even forward and backward stroke is insured, and an even stitch is made, as will be at once understood.

A spring-washer, k^3 , is placed over the end of the wrist-pin, and by its pressure upon the pitman prevents any possible slip should the parts be worn.

In use this attachment is secured upon a sewing-machine and its operating-lever engaged with the needle-screw, as usual. The rise and fall of the needle-bar imparts motion to the operating-lever, and its pawl feeds the oscillator-wheel around the cam-groove,

which gives the proper vibrations to the cloth-clamp and moves the cloth beneath the needle, so that the latter descends alternately through the cloth and past its edge, as usual.

5 In effecting this it will be noticed that the cloth-clamp guide is oscillated upon the rear stud and roller, which is held stationary by the straight portion of the grooved feeding and shifting cylinder. The operating-lever at
10 the same time is operating the clutch to feed this cylinder, and as it revolves its pitman feeds the cloth-clamp backward and forward in its oscillating guide. At the proper time the cam portion of the grooved feeding and
15 shifting cylinder operates the stud and roller to shift the guide and its cloth-clamp bodily over to bring the opposite side of the button-hole under operation. It will be noticed that in this operation, and for this purpose only,
20 the fulcrum of the guide-plate is shifted forward to the other stud and roller, and that each stud and roller acts as the fulcrum upon which the guide-plate is moved under the action of the opposite cam-cylinder, thus rendering the retaining screw through the slotted
25 guide simply a preventive of longitudinal motion.

It will be obvious that the particular form herein given to many of the parts is not arbitrary and may be changed somewhat, as may
30 be found desirable in practice under different conditions and for different work. Thus it will not alter the principle of my invention in any way if the fork now represented upon the
35 operating lever be reversed and placed upon the friction-clutch to embrace the end of the lever, and this is so obvious a change as to need no illustration.

I do not herein lay any broad claims to the
40 clutch shown and described, as I have reserved this for a separate application for patent.

In Figs. 15 and 16 I have shown a modified form of cloth-clamp, which is simpler and more economical than that before described, and it
45 is the form I prefer to construct for that reason. In it the clamp proper consists of a flanged plate, m , sliding upon the guide, and having the spring-plate m' secured to its forward end and depressed to clamp the cloth by
50 a cam and shaft, m^2 . The pitman k' is also operated by a wrist-pin of the form before described, but in this instance secured or formed upon the face of a block, n , sliding in a dove-tailed groove in the plate n' , secured over the
55 end of the shifting and feeding cam-cylinder. A screw, n^2 , journaled in said plate serves to move the block to regulate the stroke. In the same figures and Fig. 17 I also show a modified form of operating-lever having a curved
60 slot, o , engaging a pin on the friction-clutch. An adjustable stop-arm, o' , on the lever is set, as desired, to regulate the stroke of the clutch, and all these devices are exactly the same in principle as those before described.

65 Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a button-hole attachment for sewing-machines, the combination, with a cloth-clamp and a guide in which it is held and moved, 70 provided with a pivotal stud or projection, and means, substantially as described, for automatically shifting this pivotal stud at the ends of the button-hole, of a cam-grooved oscillator-wheel connected directly to the guide- 75 plate, and a connection between said wheel and the needle-bar of a sewing-machine, whereby the guide and clamp is oscillated upon its automatically-shifting pivot in properly working the button-hole, substantially as 80 and for the purpose set forth.

2. In a button-hole attachment for sewing-machines, the combination, with the cloth-clamp and its guide-plate and means, substantially such as described, for switching the 85 same laterally, of an oscillator-wheel connected to the needle-bar of the sewing-machine, and a stud or roller upon the cloth-clamp guide for engaging the oscillator-wheel, and serving both to oscillate said guide and clamp and as 90 a fulcrum upon which they are switched laterally at the ends of the button-hole, substantially as and for the purpose set forth.

3. In a button-hole attachment for sewing-machines, the combination, with the cloth-clamp and its guide and means, substantially 95 as described, for oscillating them in making the overedge stitch, of a switching-cam and means for feeding it forward, and a stud or roller upon the cloth-clamp guide for engaging 100 said cam, whereby said stud or roller is made to act both as a connection to switch the clamp and guide at the ends of the button-hole and as a fulcrum upon which they are oscillated in over stitching, substantially as and for the pur- 105 pose set forth.

4. In a button-hole attachment for sewing-machines, the combination, with the cloth-clamp, the guide-plate for the same, formed with a transverse guide-slot and having a re- 110 taining-screw passed through the same to hold it longitudinally, but permit a free lateral shifting, of a shifting-cam and an oscillator-cam connected directly to the cloth-clamp guide upon diametrically-opposite sides of its retain- 115 ing slot and screw, and means, substantially as described, for imparting an intermittent motion from the needle-bar of a sewing-machine to the two cams, substantially as and for the purpose set forth. 120

5. In a button-hole attachment for sewing-machines, the combination, with the cloth-clamp and its guide-plate, the latter provided with a switching stud or roll, of a combined feeding and switching cylinder formed with 125 a peripheral cam-groove for switching the guide and clamp by engagement with said stud or roll, and also provided with a wrist-pin on its end, and a pitman connecting this pin directly with the cloth-clamp for feeding it for- 130 ward and backward in its guide, substantially as and for the purpose set forth.

6. In a button-hole attachment for sewing-machines, the combination, with a reciprocating

ing cloth-clamp and a pitman for moving the same, formed with a square opening in its driven end, of a feeding cylinder provided with a wrist-pin formed triangular, with equal sides, 5 whereby the feed of the pitman is equalized and the stitches evenly spaced, substantially as and for the purpose shown and described.

7. In a button-hole attachment for sewing-machines, the combination, with the cloth-clamp and its guide, a switching and feeding cylinder connected by a pitman with the clamp and formed with a peripheral cam-groove engaging a stud on the guide, and a main operating-lever for connection with the sewing-machine needle-bar, of a friction feeding-clutch composed of two parts, one of which is closely fitted upon the cylinder and the other engaged with the operating-lever and connected to the first part by a clutch-pin, which rocks loosely 20 in the edge of the opening which embraces the cylinder, substantially as and for the purpose set forth.

8. In a button-hole attachment for sewing-machines, the combination, with the cloth-clamp guide and its clamp, means for oscillating the same in forming the overedge-stitch, a cam-grooved cylinder for shifting the clamp

and guide at the ends of the button-hole, and a clutch upon said cylinder having one arm extended, of a main operating-lever provided 30 with a pawl for operating the oscillator-wheel, and formed with a curved slot to receive the end of the clutch-arm, and an adjustable stop-arm pivoted on the main lever and lying across its curved slot, substantially as and for the 35 purpose set forth.

9. In an automatic button-hole attachment for sewing-machines, the combination, with the main drive-lever having a rear extension and a pawl, the oscillator-cam provided with 40 a ratchet, the feeding and switching cam-cylinder, and the friction-clutch, of the guide-plate connected at opposite ends to the oscillator-cam and the switching and feeding cam, the cloth-clamp sliding in said guide-plate, 45 and the pitman connecting it with the feeding-cylinder, substantially as and for the purpose set forth.

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

JOHN W. BLODGETT.

Witnesses:

W. C. McARTHUR,

W. S. McARTHUR.