

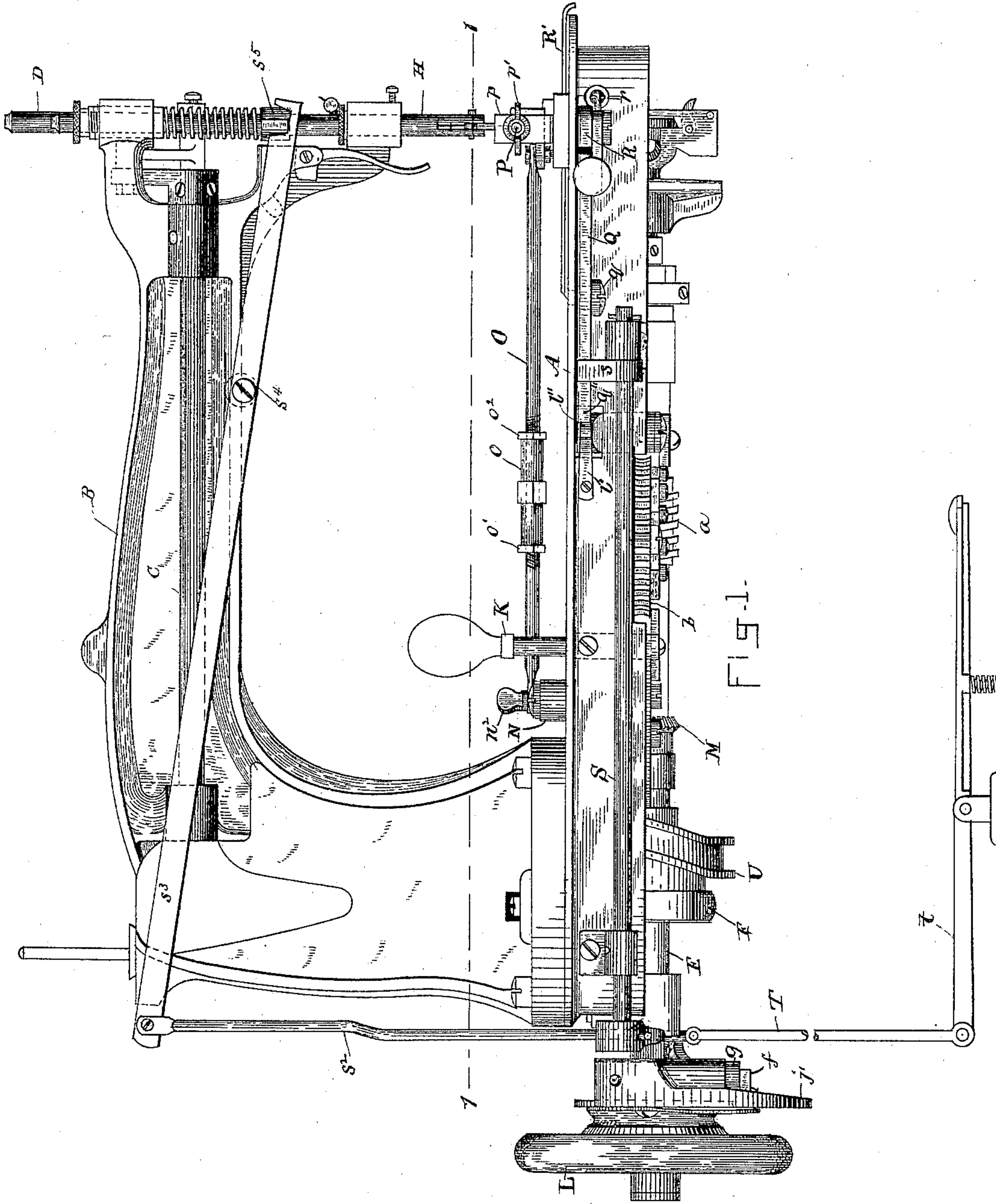
(No Model.)

3 Sheets—Sheet 1.

L. C. WING.
BUTTON SEWING MACHINE.

No. 395,372.

Patented Jan. 1, 1889.



Witnesses:
H. Brown.
E. H. Munday

Inventor:
L. C. King.
by Wright, Brown & Bosley.
Attorneys.

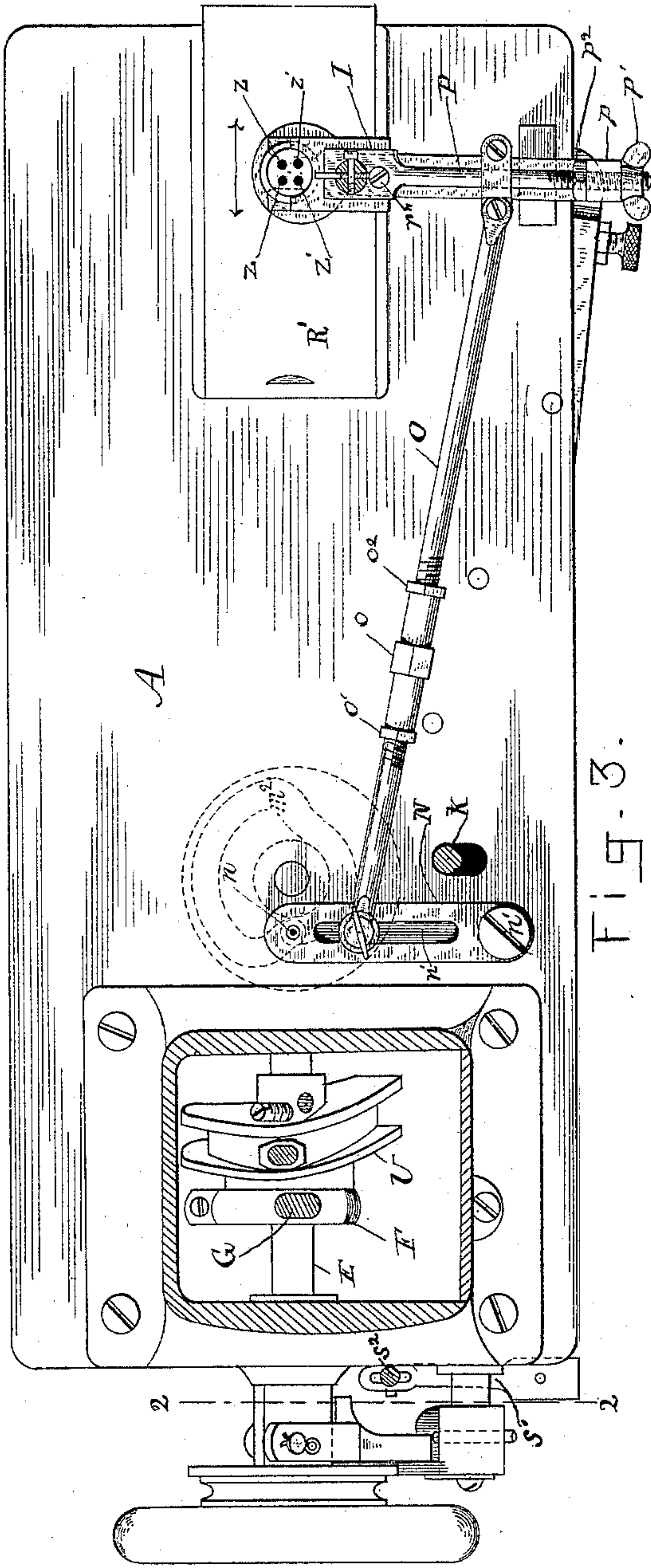
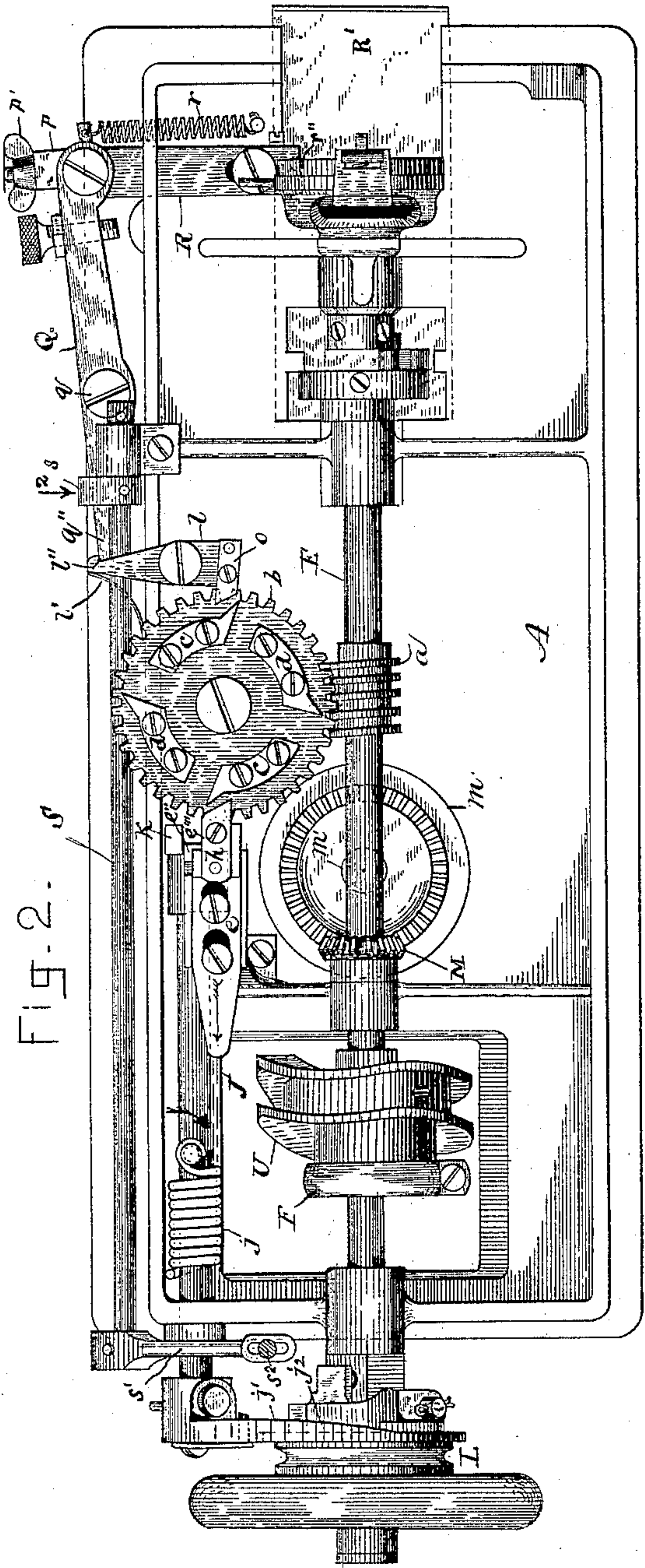
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Witnesses:

H. Brown

Est. Woodward

17 Ven 10 r:

L. C. Ming.

By Wm. B. Brown & Crossley
Attorneys.

Attorneys.

(No Model.)

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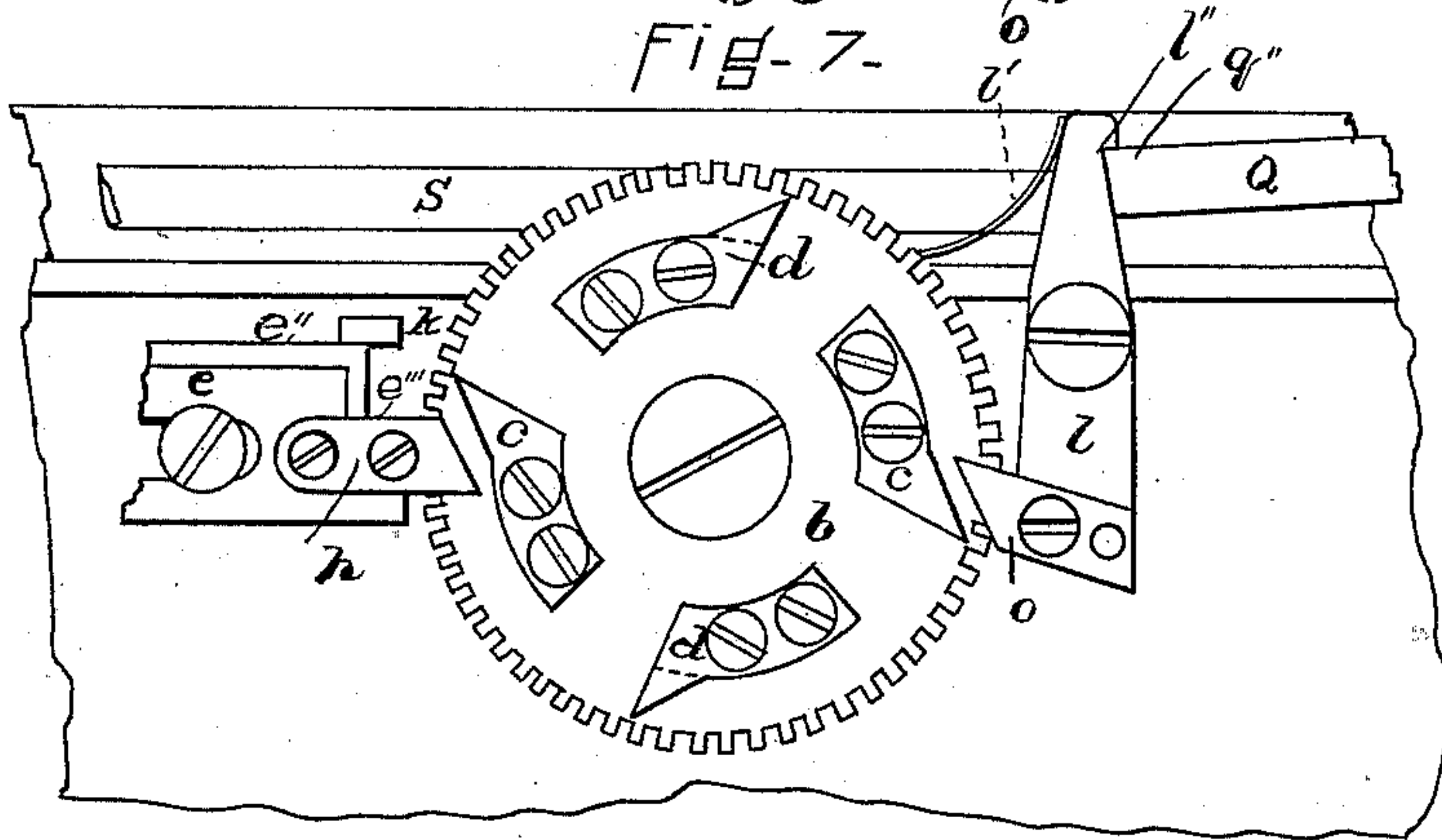
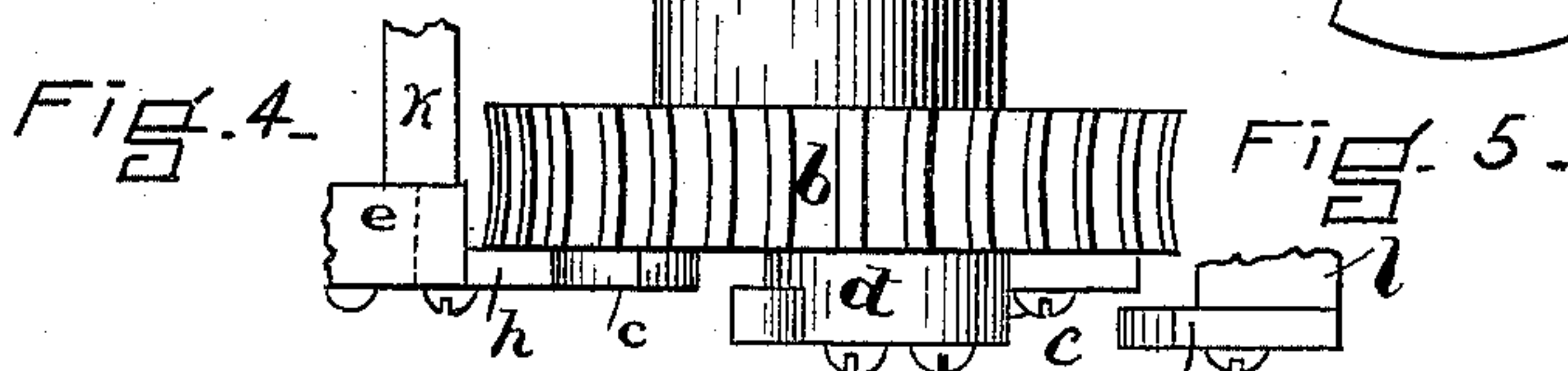
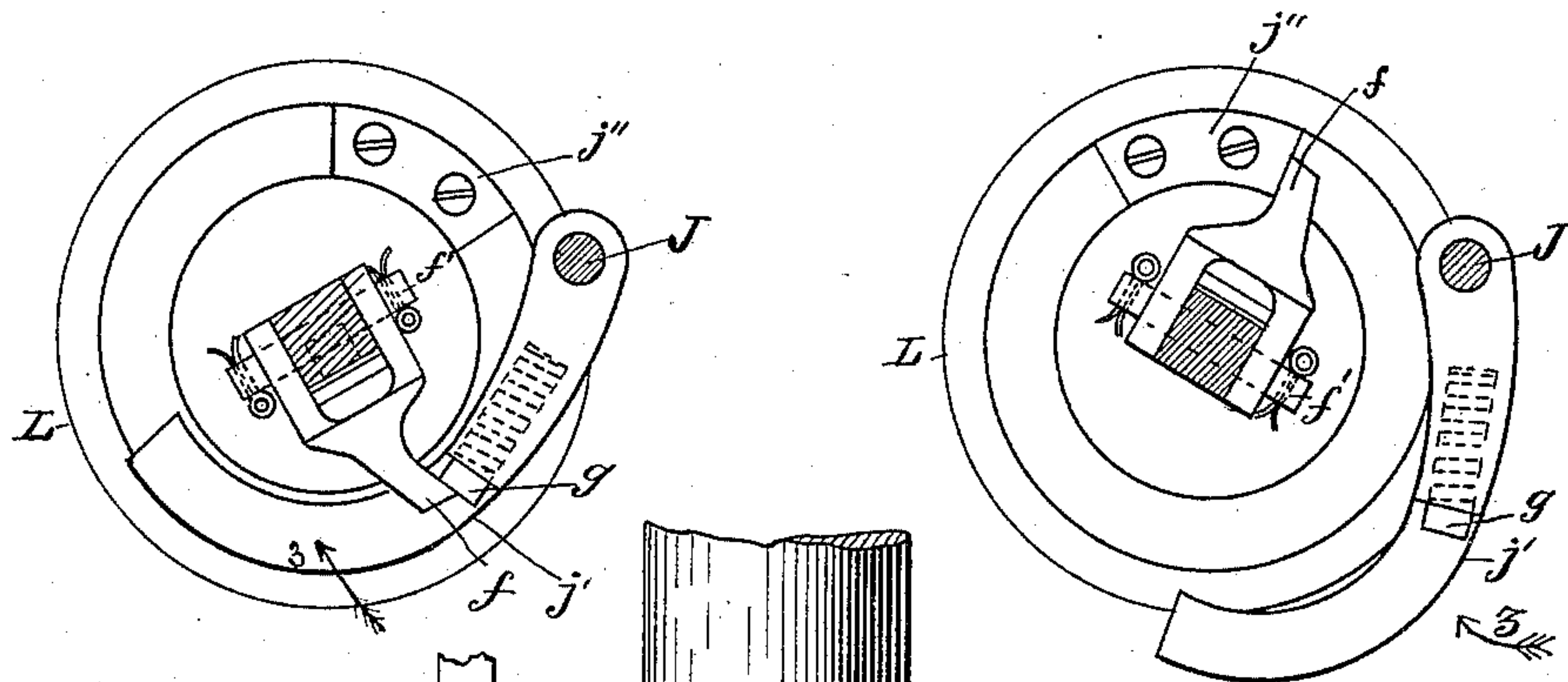
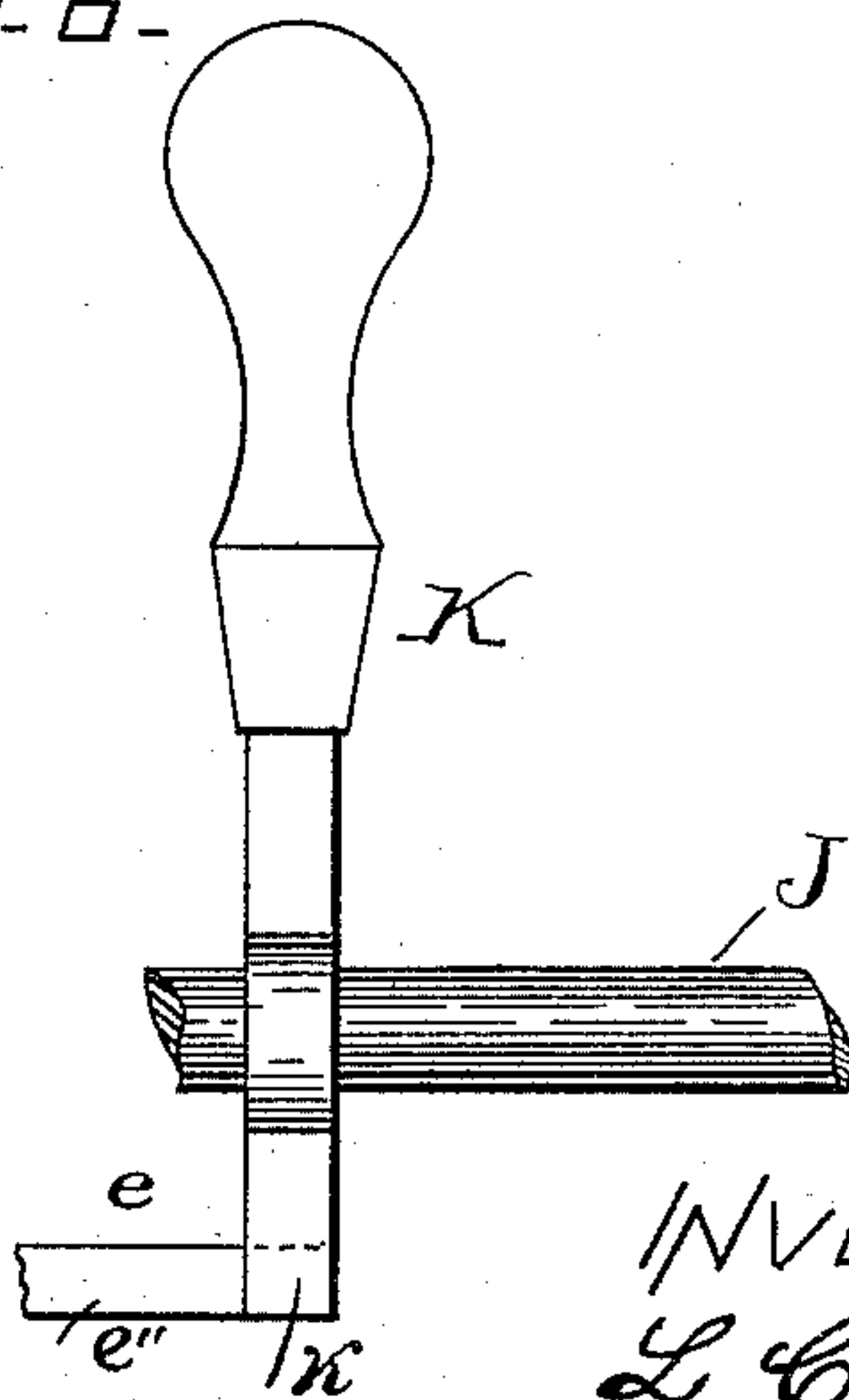


Fig. 6.



WITNESSES.
A. D. Grover—
J. T. Ball.

INVENTOR.
L. C. Wing.

Fig. 8. *Myr. Brown & Crossley*
attys.

UNITED STATES PATENT OFFICE.

LINGAN C. WING, OF BOSTON, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE UNION BUTTON SEWING MACHINE COMPANY, OF MASSACHUSETTS.

BUTTON-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 395,372, dated January 1, 1889.

Application filed September 4, 1886. Serial No. 212,673. (No model.)

To all whom it may concern:

Be it known that I, LINGAN C. WING, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Button-Sewing Machines, of which the following is a specification.

My invention relates to an organized machine by which to sew buttons upon fabrics or garments, and particularly to a machine or class shown and described in Letters Patent of the United States, granted to L. J. Driscoll December 16, 1884, Nos. 309,209 and 309,210, and December 25, 1883, No. 290,981.

It is the special purpose of my invention to improve the machines disclosed in said Letters Patent to the end of securing simplicity and strength of construction in all of the elements, exactness and readiness of adjustment of such parts as it is desirable or necessary to have adjustable, and certainty and smoothness or steadiness in the operation of the entire machine.

Having thus indicated the nature and objects of my invention, I will proceed to describe the same, so that others skilled in the art to which it appertains may be able to make and use it, reference being had to the accompanying drawings, and to the letters of reference marked thereon, the invention being particularly pointed out and distinctly claimed at the end of the explanation of its construction and operation.

Of the drawings, Figure 1 represents a rear elevation of the invention. Fig. 2 is a bottom plan view of the same, the treadle-rod for operating the presser-foot, &c., being shown in section. Fig. 3 represents a sectional plan view on the line 1 1, Fig. 1. Fig. 4 indicates a sectional detail view of the clutch mechanism on the line 2 2, Fig. 3. Fig. 5 is a similar view, the parts being represented in a different position. Figs. 6, 7, and 8 are detail views hereinafter referred to.

Similar letters of reference indicate similar parts in all of the figures.

Such devices and groups of devices as perform common and well-known functions and are fully understood by those skilled in the art and constitute no part of my present in-

vention will not be particularly described hereinafter.

In the drawings, A represents the bed, and B the overhanging arm, in which is journaled the needle-shaft C for operating the needle-bar D.

E indicates the main shaft, provided with an eccentric, F, by which the connecting-link G is actuated to impart motion to the needle-shaft in the usual manner.

H represents the presser-bar for holding down the button-carrier I, and such device or devices as may be considered as constituting the presser-foot.

The main shaft is provided with a worm, *a*, engaging the teeth of a pattern-wheel, *b*, provided with lugs or cam-pieces *c* *d*, the former adapted on one side to engage the adjacent end or finger *h* of a slide, *e*, and the latter on the opposite side to come in contact with the laterally-projecting finger *o* of the latch-lever *l*. As shown in Figs. 6 and 7, a cam-piece, *c*, which is quite thin, is arranged close to pattern-wheel *b* and in the same horizontal plane as the end or finger *h* of slide *e*, so that in the rotation of said wheel said cam-piece may be brought in contact with the end of the finger of said slide.

Laterally-projecting finger *o* of latch-lever *l* is arranged at a lower horizontal plane than cam-piece *c* and slide *e*, so that in the rotation of wheel *b* said cam-piece *c* will pass above said finger without touching it, while cam-piece *d* is offset from the lower face of wheel *b*, so as to pass below slide *e*, but in the same horizontal plane with finger *o*, and therefore adapted to be brought into contact therewith. The lower end, *k*, of shipper-handle K, rigidly secured to rock-shaft J, is adapted to rest on the rear edge, *e''*, of the slide *e*, as shown in Fig. 2 and in detail in Figs. 6 and 8, when said slide is held by its actuating-spring (not shown) toward the pattern-wheel *b*; but when said slide is moved by the pattern-cams *c* in the direction of the arrow marked thereon in Fig. 2, said lower end of the shipper-handle will, by operation of spring *j*, which tends to revolve the shaft J in the direction of the arrow marked on said shaft, drop from the rear edge, *e''*, of said slide

e onto the rear edge, *e'''*, of finger or offset *h*, rocking shaft *J* in its bearings and permitting the arm *j'*, rigidly secured to the outer end of shaft *J*, to be moved into the line or path of travel of the dog or clutch device *f*, pivoted by the pin *f'* on and so as to turn with the main shaft, (the direction of movement of arm *j'* being indicated by arrow 3 in Figs. 4 and 5,) causing said dog to ride up the inclined face *j²* (see Figs. 1 and 2) of said arm *j*, turning the dog on its pivot against a spring, (not shown,) and disengaging it from a block or lug, *j''*, on the driving-pulley and balance-wheel *L* loose on main shaft *E*, and permitting the said pulley and wheel to turn freely on the shaft without operating the same.

After dog or clutch device *f* has been rocked to a sufficient extent by its engagement with the inclined face *j²* of arm *j'* to disengage said dog from the block or lug *j''* on the driving-pulley and to bring the needle into its highest position, the dog will be caused to abut against a "pump-center" or spring-pressed pin, *g*, (see Figs. 4 and 5,) set in a well or hole formed in an offset (see Fig. 1) formed on arm *j'*, and thus entirely stop the rotation of said shaft with the needle up, as stated. The object of the pump-center or pin *g* is to cushion what would otherwise be a concussive blow given to the arm *j'* by the dog *f* in being suddenly stopped. Said pin, instead of being cushioned by a spring, might be made of solid rubber or similar material arranged in substantially the same way, with a similar result.

In Fig. 4 I have shown the dog *f* on the main shaft as engaged with the block *j''* of the driving-pulley. This will be the position of the parts when the machine is being operated, and the arm *j'* is held out of the path of travel of dog *f* by lever *K* when the lower end, *k*, thereof is made to rest on the rear edge, *e''*, of slide *e*.

In Fig. 4 arm *j'* is shown as having been moved inward in the path of travel of dog *f*, and the latter as having ridden up the inclined face *j²* of said arm, and said dog drawn away from block *j''* of the driving-pulley, and said pulley released from the main shaft, the dog *f* having been brought against the spring-pressed pin *g*, which will be the position of the parts mentioned when the slide *e* has been moved in the direction of the arrow marked thereon in Fig. 2, and the lower end, *k*, of lever *K* has dropped from the edge *e''* of the slide *e* to the offset edge *e'''*, permitting the spring *j* to rock shaft *J*, so as to move arm *j'* from the position in which it is represented in Fig. 5 to that in which it is portrayed in Fig. 4.

M represents a small bevel-gear secured to the main shaft *E*, and intermeshing with the teeth of a larger horizontally-arranged bevel-gear, *m*, turning on a stud, *m'*, secured to the bed of the machine. Said wheel *m* is provided on its upper face with an irregular cam-groove, *m²*, (shown in dotted lines in Fig. 3,) into

which a trundle-stud, *n*, extending down from the forward end of lever *N*, pivoted on the upper face of the bed at *n'*, projects.

O represents a rod connecting lever *N* with the button-carrier and presser-foot *I*. Said rod *O* is formed in two parts—that is, it is divided near its center and has a right-hand screw-thread formed on the end of one part and a left-hand thread on the adjacent end of the other part and an elongated right and left screw-threaded nut, *o*, screwed thereon—by which improved means the rod *O* can be regulated or adjusted to regulate the position of the button-carrier and button laterally—that is, in the direction indicated by the double-headed arrow, Fig. 3—as desired with respect to the needle. Jam or lock nuts *o' o²* are screwed onto the ends of the rods, and after nut *o* has been properly set or adjusted are turned up against said nut to lock or hold it in position.

The revolution of wheel *m* imparts, through the medium of its cam-groove *m²*, acting on the trundle-stud *n*, a vibratory motion to lever *N*, which in turn imparts a like motion to the button-carrier and presser-foot *I*, pivoted at *n''*, as hereinafter explained, through the medium of rod *O*.

To provide for the variation in the throw or extent of vibration of the button-carrier, I form a slot, *n'*, in lever *N*, and provide a set-nut, *n²*, for clamping or setting the stud upon which the end of bar *O*, connected with lever *N*, is pivoted at any point within the limits of said slot. As it is desirable oftentimes to vary the extent of vibration of the button-carrier in a very slight degree for various kinds of work, adjustment in this manner is of the greatest importance and provides for results that could not be attained if lever *N* were provided at short intervals with holes in which the pivot-pin of rod *O* might be set.

To provide for the adjustment of the button-carrier and button with respect to the needle at right angles to the line indicated by the double-headed arrow before mentioned I form a screw-thread on the rod *P*, to which rod *O* is pivoted, projecting rearwardly from the button-carrier *I*, through a block or stud, *p*, projecting up from the presser-foot mechanism, and turn a thumb or set nut, *p'*, on said screw-threaded end of rod *P*, providing a jam-nut, *p²*, for locking or fixing said rod in position after it has been once properly set or adjusted by the thumb-nut. This improved mechanism, like the means by which rod *O* is connected with lever *N*, provides for adjustment of the button-carrier with respect to the needle to a degree of the utmost nicety—a matter of importance in button-sewing machines.

Lever *l*, Figs. 2 and 6, is provided at its outer or rearward end with an offset or hook, *l''*, adapted to snap over the adjacent end *q''* of lever *Q* by the action of spring *l'* when the end *q''* of said lever is pressed inward by the

operation of finger *s*, secured to rock-shaft *S*, as hereinafter explained, as represented in said Figs. 2 and 6.

Lever *Q* is pivoted near its middle, as at *q*, to the bed of the machine, and at its forward end is pivoted to the rearward or outer end of a bar, *R*, arranged substantially at right angles to lever *Q*, and to which bar *R* the button-carrier is pivoted, as at *r''*, Figs. 2 and 3, and shifts the latter by the operation of spring *r* when locking-lever *l* is disengaged from the end of lever *Q* by the action of one of the cam-lugs *d* on the finger *o* of said lever *l*. Pivot *r''* extends through a slot (not shown) in needle or work plate *R'*, said slot being elongated in a direction at right angles to main shaft *E*.

By dispensing with all of the devices intermediate of the lever *Q* and button-carrier *l*, save the bar *R*, I am enabled to greatly simplify the construction of the machine at this point, securing entire certainty of operation and reducing liability of breakage and of the parts being disarranged or disordered.

S indicates a rock-shaft having suitable bearings in the bed of the machine, which rock-shaft is provided at its forward end with an upwardly-extending finger, *s*, the upper end of which rests against the rear edge of lever *Q* back or to the rear of its fulcrum-point. At its rear end rock-shaft *S* is provided with a laterally-extending arm, *s'*, (see Figs. 2 and 3,) the inner end of which is connected by a link, *s''*, with the rear end of a lever, *s'''*, pivoted at *s''''* to the overhanging arm *B*, and at its forward end extending under a lug, *s'''''*, projecting laterally from the presser-bar, as represented in Fig. 1, so that when the presser-bar is raised to insert the work and a new button in the button-carrier, by depressing the rear end of lever *s'''* the shaft *S* will be rocked, so as to cause its attached finger to move the rear end of bar *Q* inward in the direction of arrow 2, Fig. 2, so that the adjacent end of lever *l* will, by the action of spring *l'*, snap thereover, all as will be readily understood by an inspection of Fig. 2 of the drawings.

In order to enable the operator to readily depress the rear or inner end of lever *s'''*, for the purposes explained, or to simply raise the presser-foot, I extend connecting-link *s''* by attaching thereto a rod, *T*, connected with a treadle, *t*, adapted to operate on the floor, whereby, when said treadle is depressed, the rear end of lever *s'''* will be drawn down, with the result specified.

As shown, gear-wheel *m* has twice the number of teeth that are formed in wheel *M*, so that the latter wheel will make but one revolution to two of the former. Consequently rod *O* will be reciprocated once to each two revolutions of the main shaft *E*, and two reciprocatory movements of the needle-bar, this timing of the parts being necessary in order to secure the descent of the needle first through one hole of the pair of holes in the button

being operated upon, and then through the other.

If desired, wheel *m*, as is obvious, may be constructed with a cam-groove in its periphery, similar to cam *U*, for operating the take-up devices, and be vertically arranged on an independent stud, instead of horizontally, as shown, and be operated by a gear similar to gear *M* on the main shaft. I prefer, however, the arrangement shown.

In operation, the parts being set and arranged as represented in Fig. 2, except that a cam-piece, *c*, will have just passed finger *h* of slide *e*, a four-hole button being in the button-carrier, and the goods to which the button is to be attached being placed under the presser-foot and the machine set in motion, the needle will descend and stitch first through one of the holes *z* and then the other until cam-piece *d* comes in contact with finger *o* of lever *l*, when the latter will be unlocked from lever *Q*, and the latter and bar *R*, with which it is connected, will be moved by the operation of spring *r*, which will shift the button-carrier, (it being recollected that the button-carrier is pivoted to bar *R* at *r''*), so that the needle will operate through holes *z'* *z''* of the button, as through the holes *z* *z*, as before explained, until one of the cam-pieces *c* comes in contact with finger *h* on slide *e*, and moves said slide in the direction of the arrow marked thereon, when the lower end, *k*, of lever *K* will slip off the rear face, *e''*, of slide *e* onto the rear face, *e'''*, of finger *h*, permitting spring *j* to rock shaft *J* in the direction of the arrow thereon, so as to carry the inner end of arm *j'* into the path of travel of clutch-dog *f*, and operate the same, with the result hereinbefore explained.

To operate the machine to repeat the work of sewing on a button, after the latter is placed in position in the carrier and the goods put under the presser-foot, the lever *K* is operated so as to rock shaft *J* in a direction opposite to the arrow, which will move arm *j'* out of engagement with clutch or dog *f*, and allow the latter to become engaged by the driving-pulley *L*, and the main shaft *E* to be operated. At the same time the lower end, *k*, of lever *K* will be moved rearward, so as to cause it to engage the rear face, *e''*, of slide *e*, moved by a spring (not shown) in a direction opposite to the arrow marked thereon, when the operation of sewing on a button will proceed as before, the raising of the presser-foot and button-carrier having operated rock-shaft *S*, so as, through the medium of finger *s*, to move lever *Q* in position to have the hooked end *l''* of lever *l* snap over the end *q''* of lever *Q*, and hold the latter locked in the position in which it is represented in Fig. 2.

To operate the machine to sew on two-hole buttons cam-pieces *d* will be replaced by cam-pieces similar to those marked *c*, and the use of levers *l* and *Q* and bar *R* and their adjuncts, constituting the button-shifting devices, dispensed with, the button-carrier hav-

ing been adjusted so as to bring the eyes of the buttons in proper position with relation to the needle, when the machine will be operated and stopped at each quarter-revolution of wheel *b* by the cam-pieces *c* coming in contact with finger *h* of slide *e* and there being no shifting of the button-carrier.

By the improvements described it will be seen that the machine shown and described in the Driscoll patents, before mentioned, has been greatly simplified, rendered more compact in form, cheapened in construction, made more certain in its movements, less liable to get out of order, more readily adjusted to different characters and sizes of buttons, and made easier of and smoother and steadier in operation.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a button-sewing machine, as a means for readily and with the utmost nicety adjusting the button-carrier with respect to the needle on a line substantially transverse to the reciprocating movements of the carrier, the combination, with a sewing mechanism, of a button-carrier provided with a rod, *P*, screw-threaded on its rear end, a presser-foot mechanism provided with a lug or block, *p*, having a hole through which the rod *P* passes, a thumb-screw, *p'*, on the outer end of the rod to adjust the button-carrier, and a locking-nut, *p*²,

to lock the button-carrier in adjusted position, substantially as set forth.

2. In a button-sewing machine, a sewing mechanism, a button-carrier and means for operating it, the main shaft, a dog, *f*, pivoted thereon, a driving-pulley running loose on the main shaft and adapted to engage the dog and drive the main shaft, a rock-shaft, *J*, and means for controlling the movement of the same, and an arm, *j'*, on the rock-shaft, provided with a spring-pressed pin, *g*, and having the inclined surface *j*², substantially as set forth.

3. A sewing mechanism and a button-carrier, in combination with a lever, *R*, directly connected with the button-carrier, levers *Q* and *l*, for locking or holding the button-carrier in one position, lever *Q* being directly connected with lever *R*, and lever *l* being directly connected with lever *Q*, a spring for moving the button-carrier to another position when released by the levers, the main shaft, and cams or wipers operated by the main shaft and arranged to operate on lever *l*, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 31st day of August, A. D. 1886.

LINGAN C. WING.

Witnesses:

ARTHUR W. CROSSLEY,
C. F. BROWN.