

(No Model.)

3 Sheets—Sheet 1.

A. A. CUMING.
SEWING MACHINE.

No. 333,201.

Patented Dec. 29, 1885.

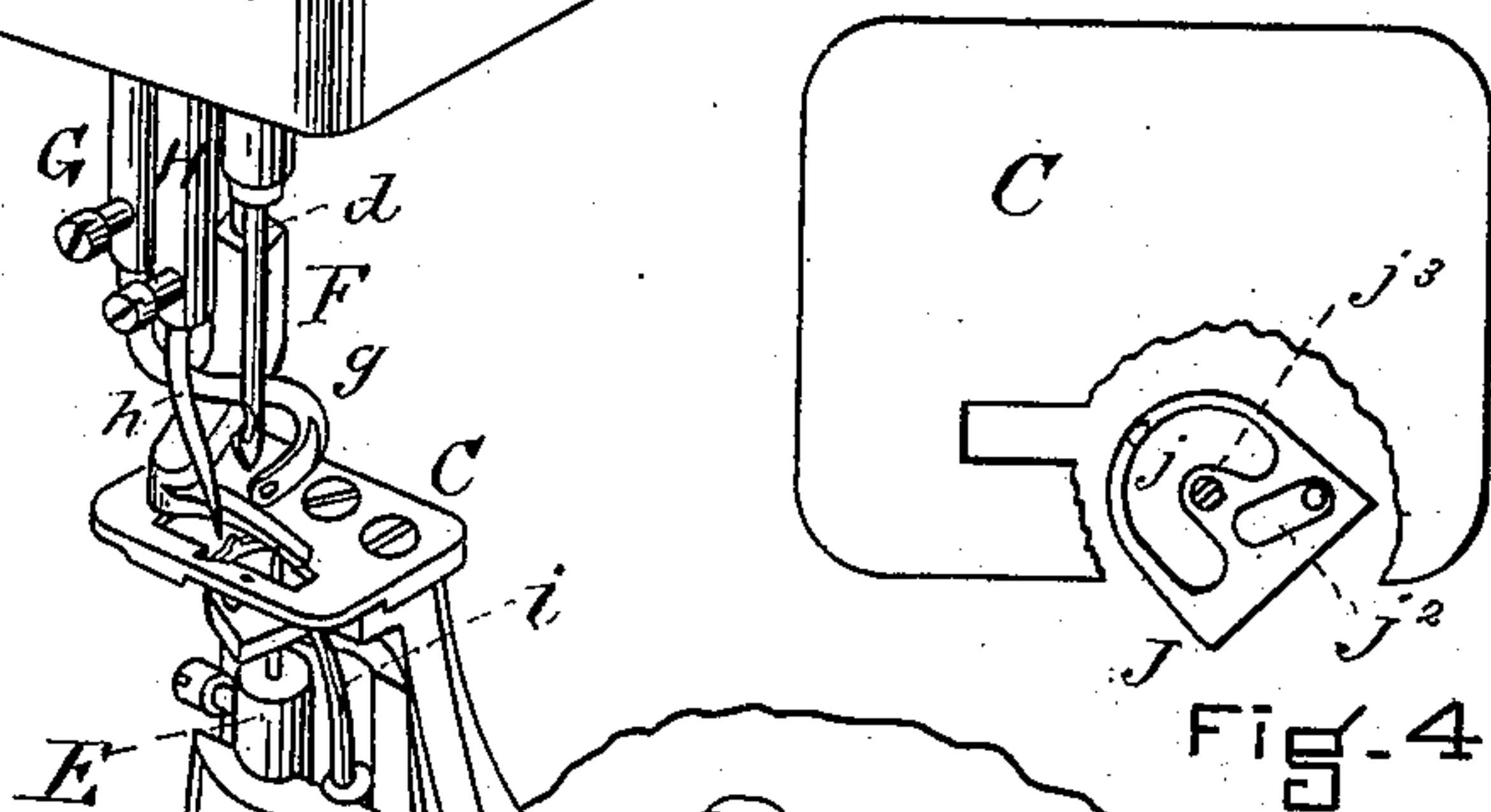
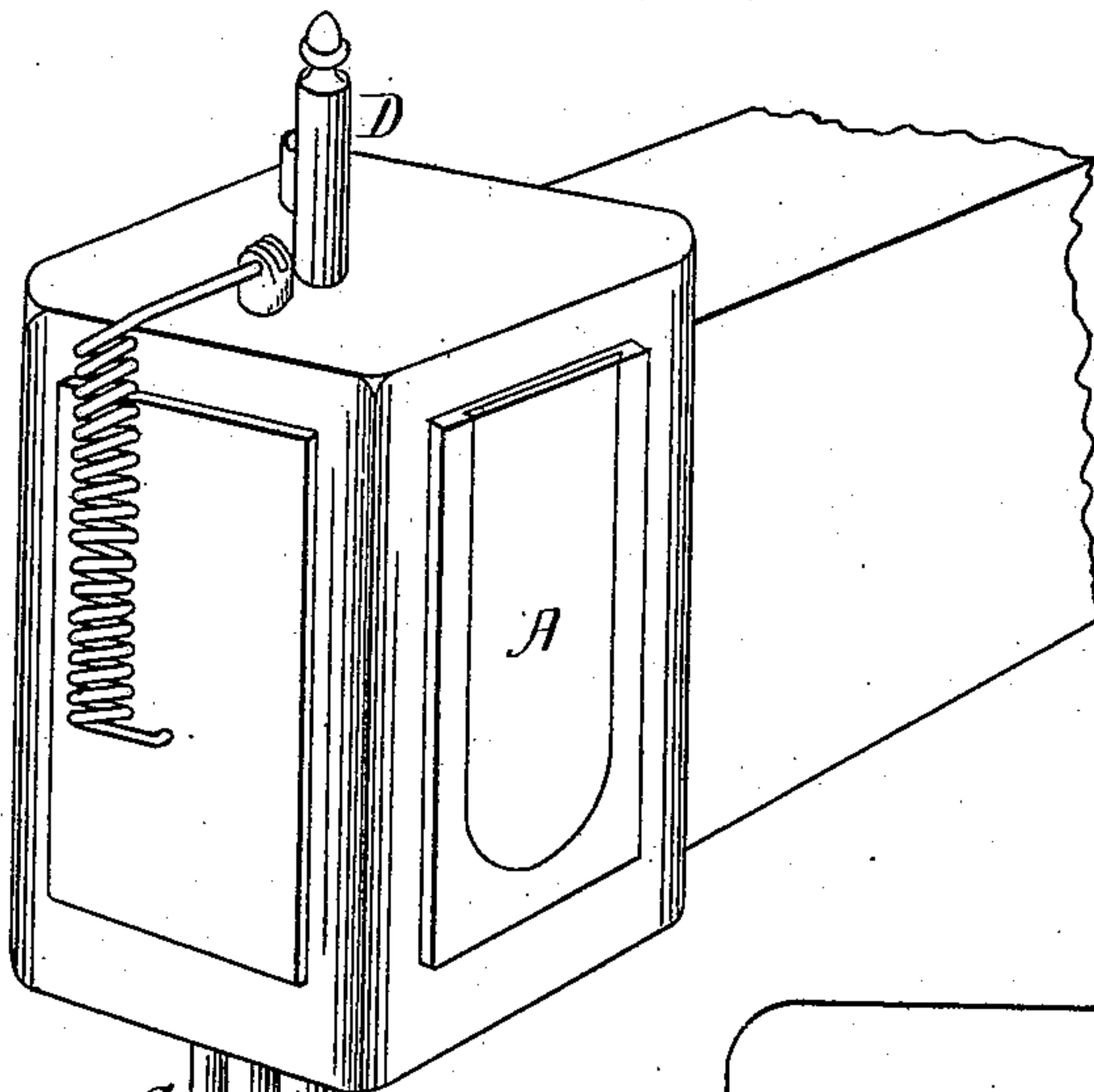
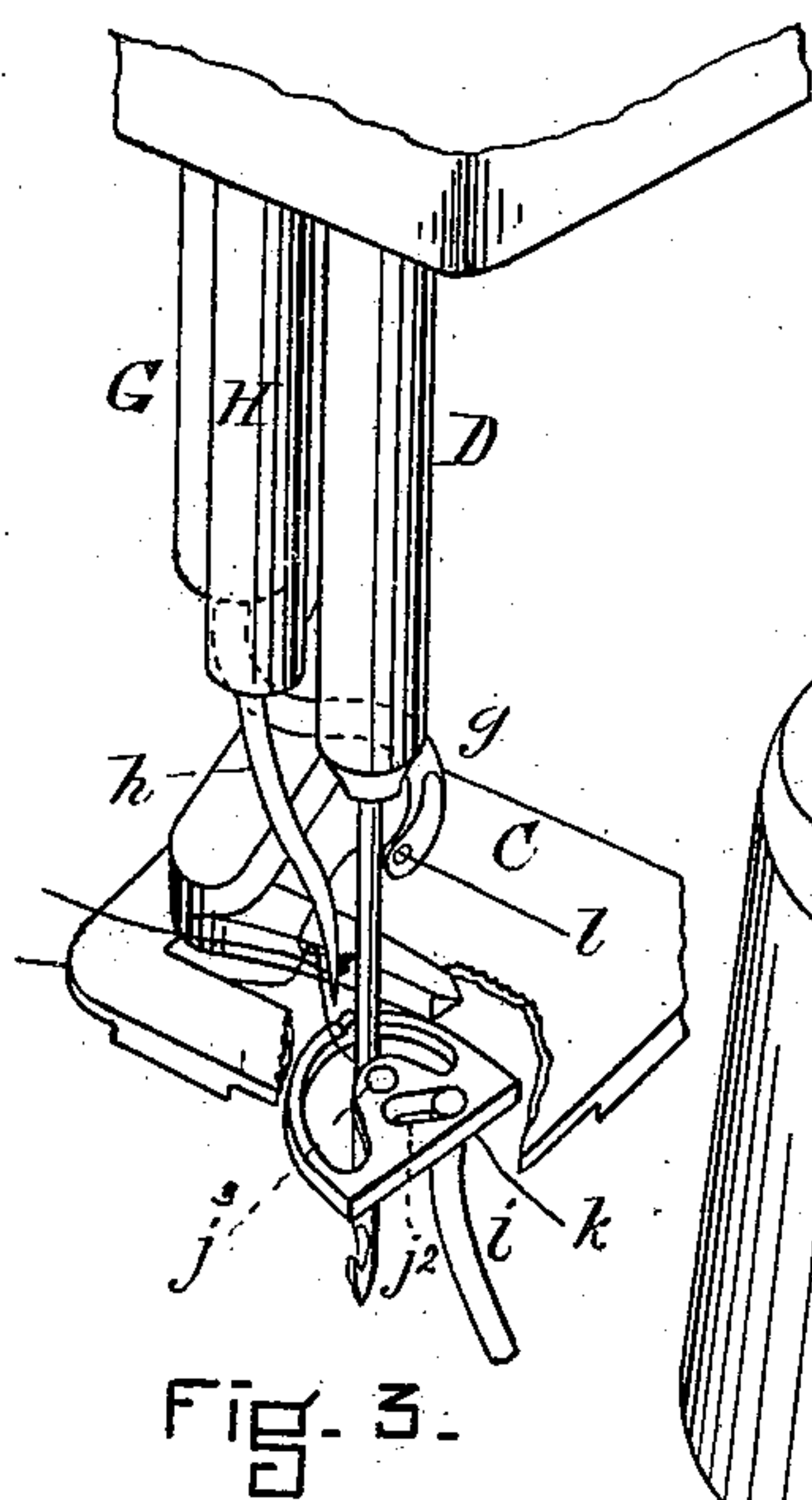
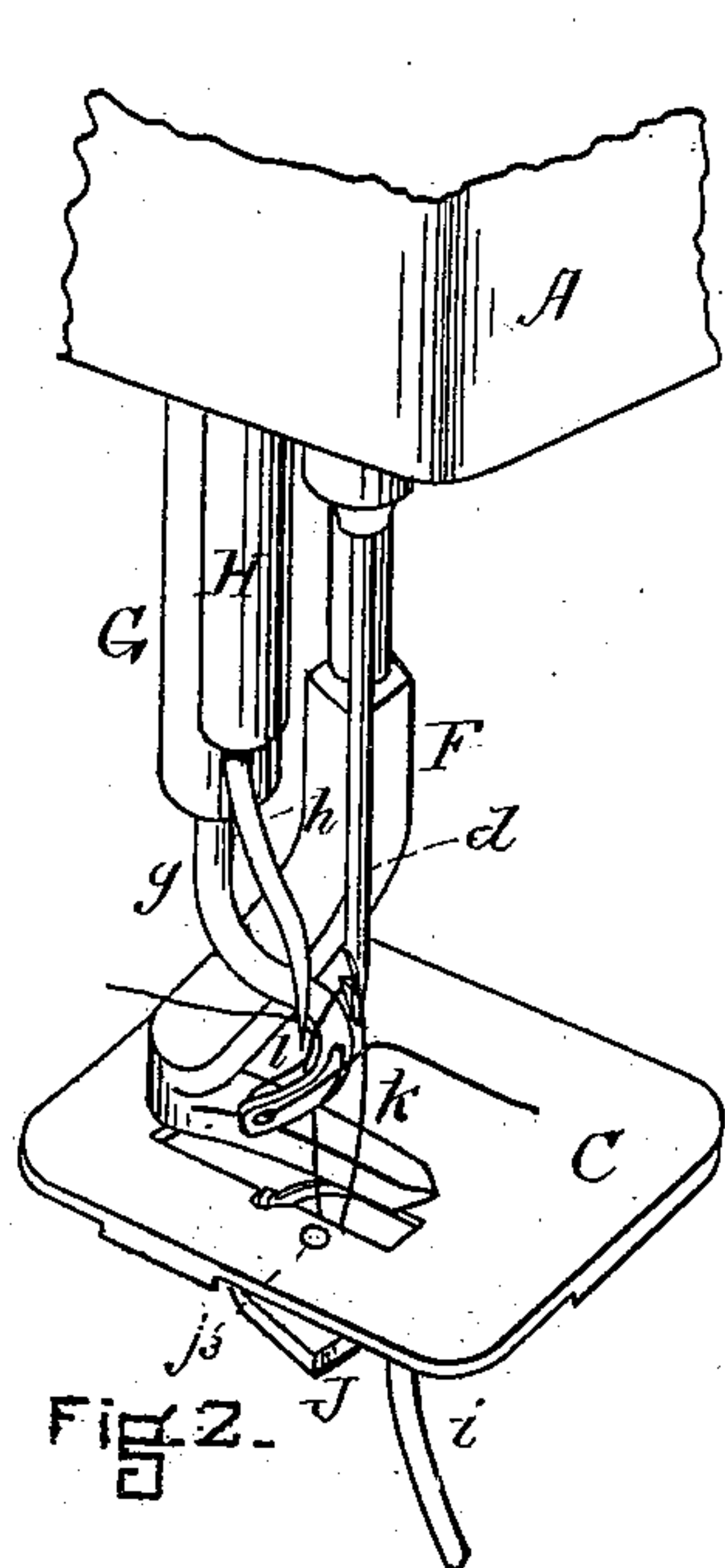


FIG. 1.

WITNESSES.

E. A. Thelen.
Fred. B. Dolan.

INVENTOR

Alfred A. Cuming
by his attys-
Charles & Raymond.

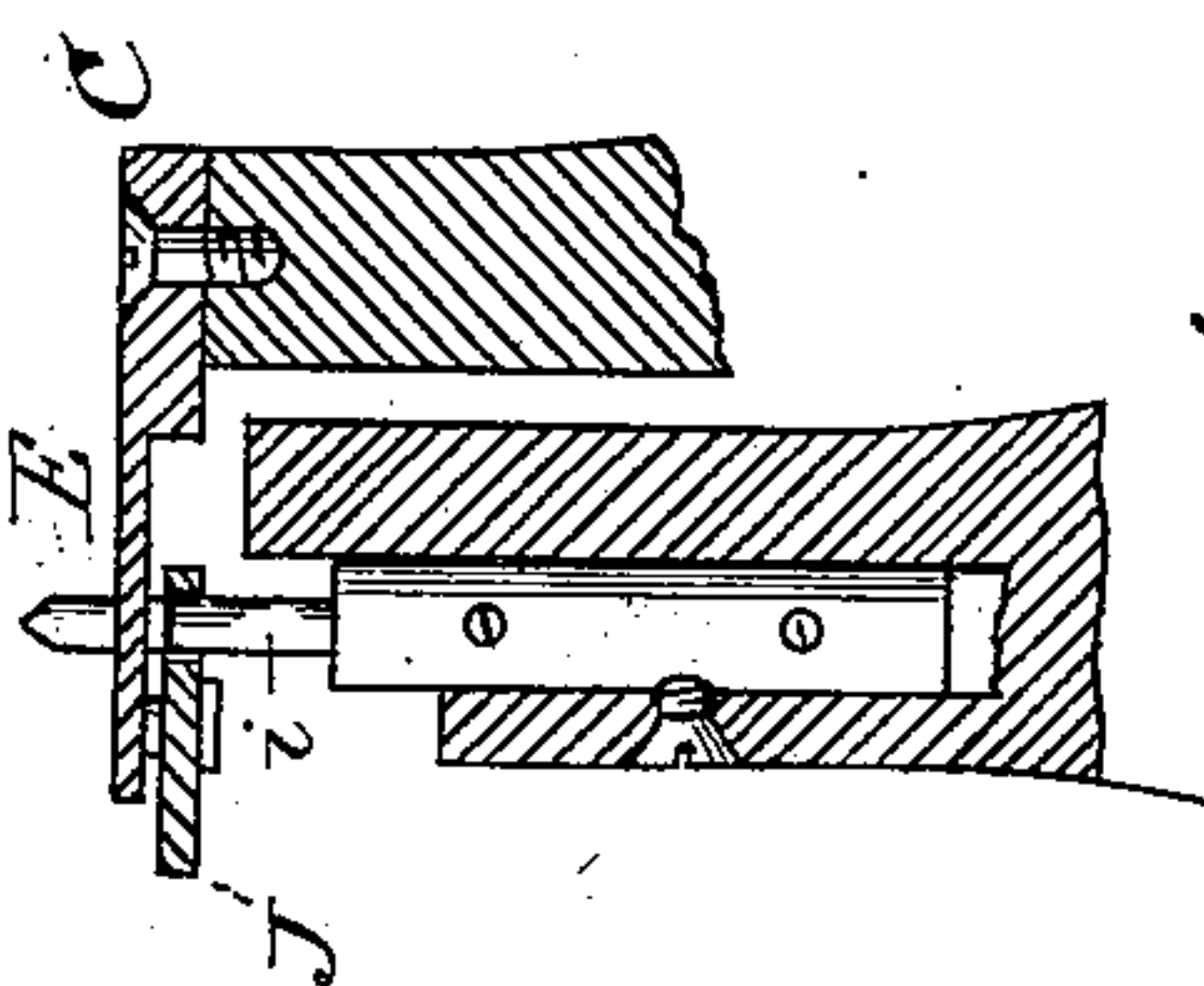
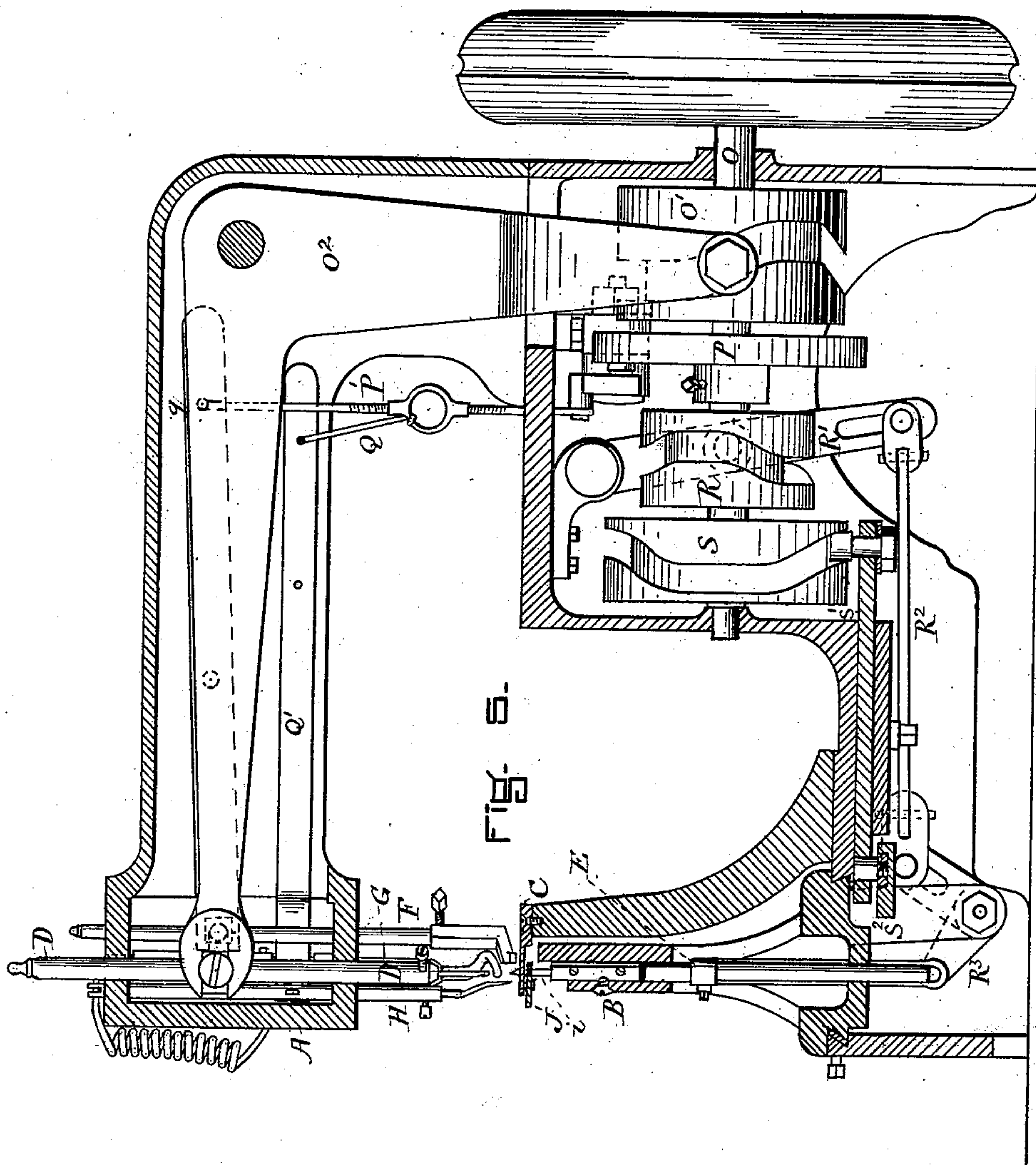
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3 Sheets—Sheet 2.

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WITNESSES.

J. W. Dolan.
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Fig. 6.

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(No Model.)

3 Sheets—Sheet 3.

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SEWING MACHINE.

No. 333,201.

Patented Dec. 29, 1885.

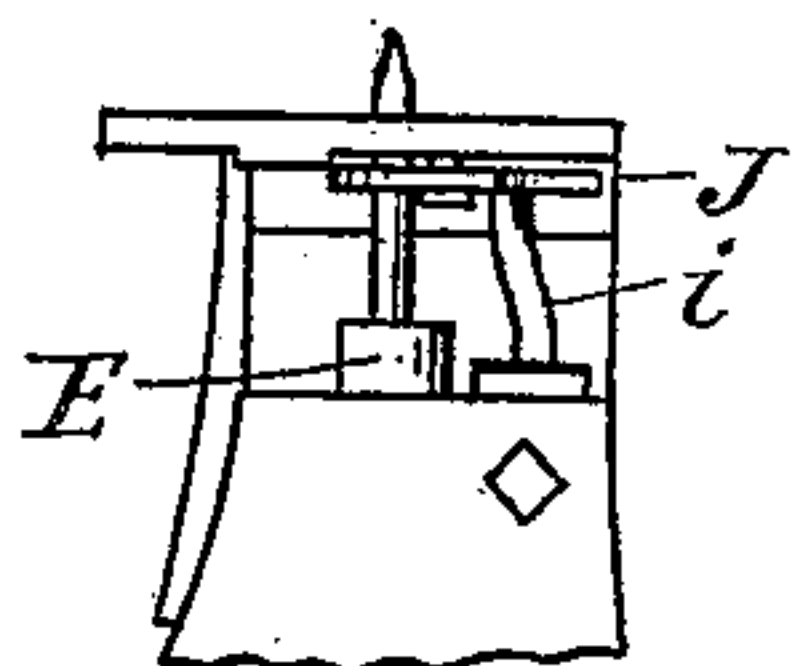


FIG. 10.

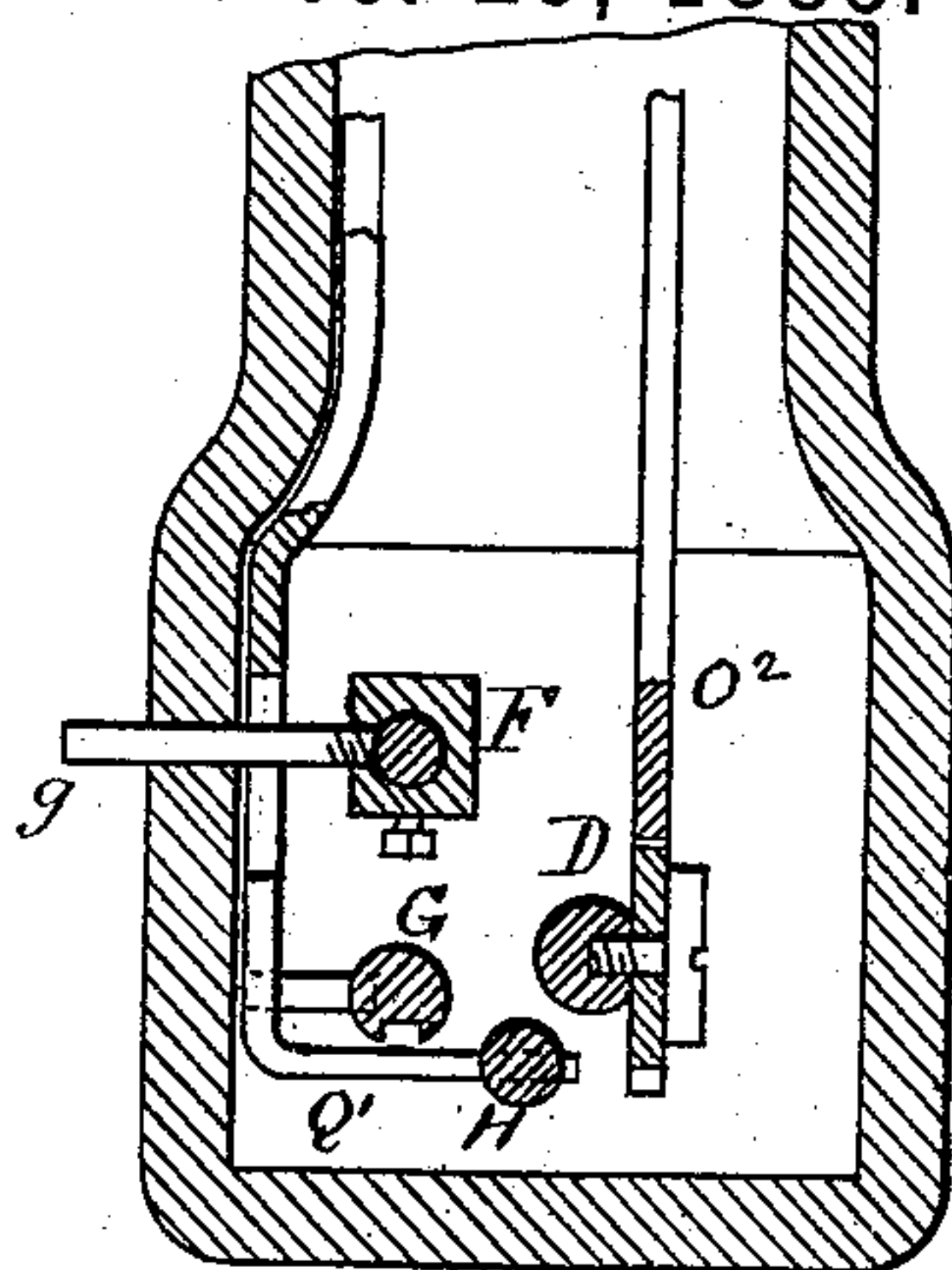
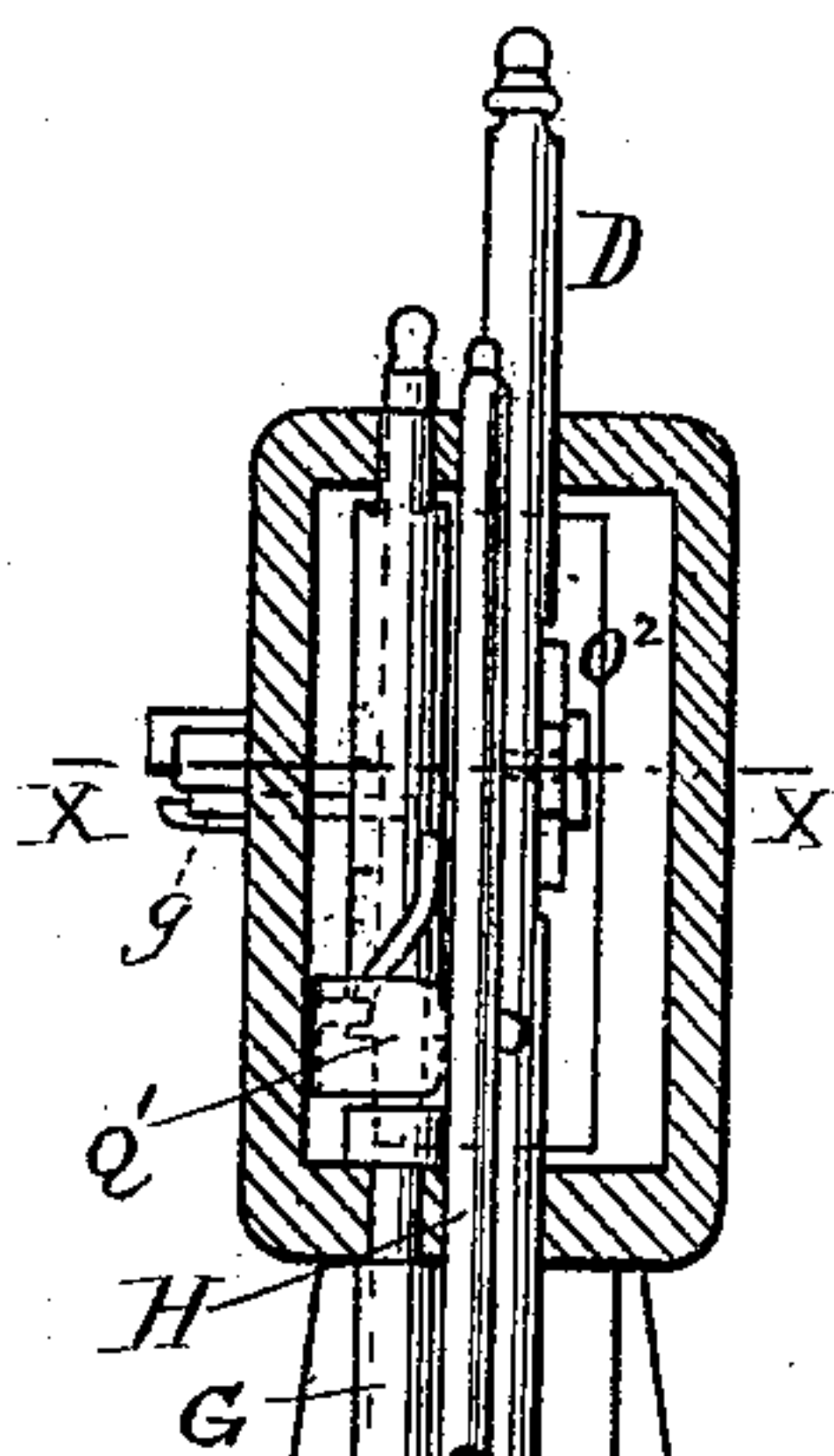


FIG. 8.

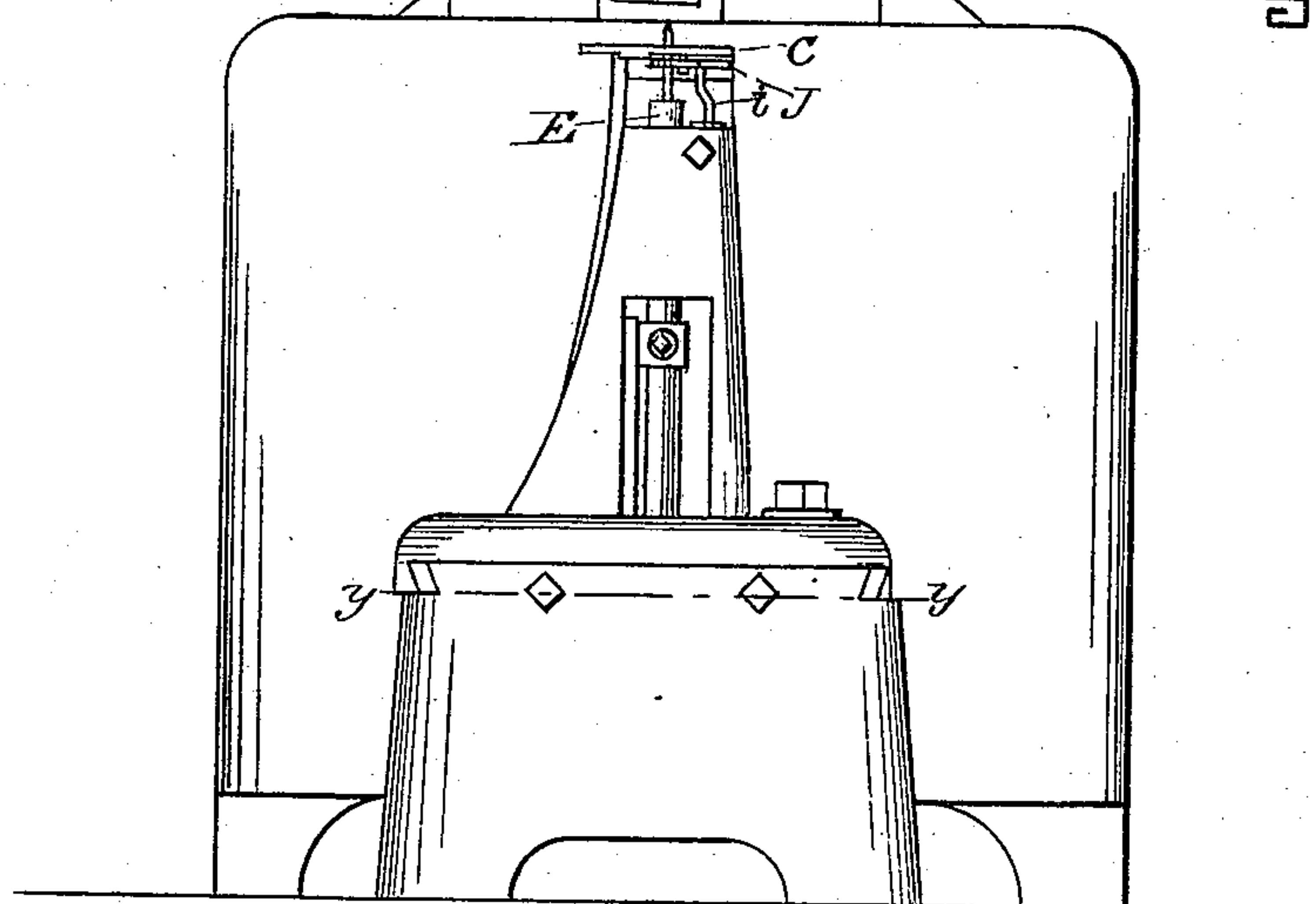


FIG. 7.

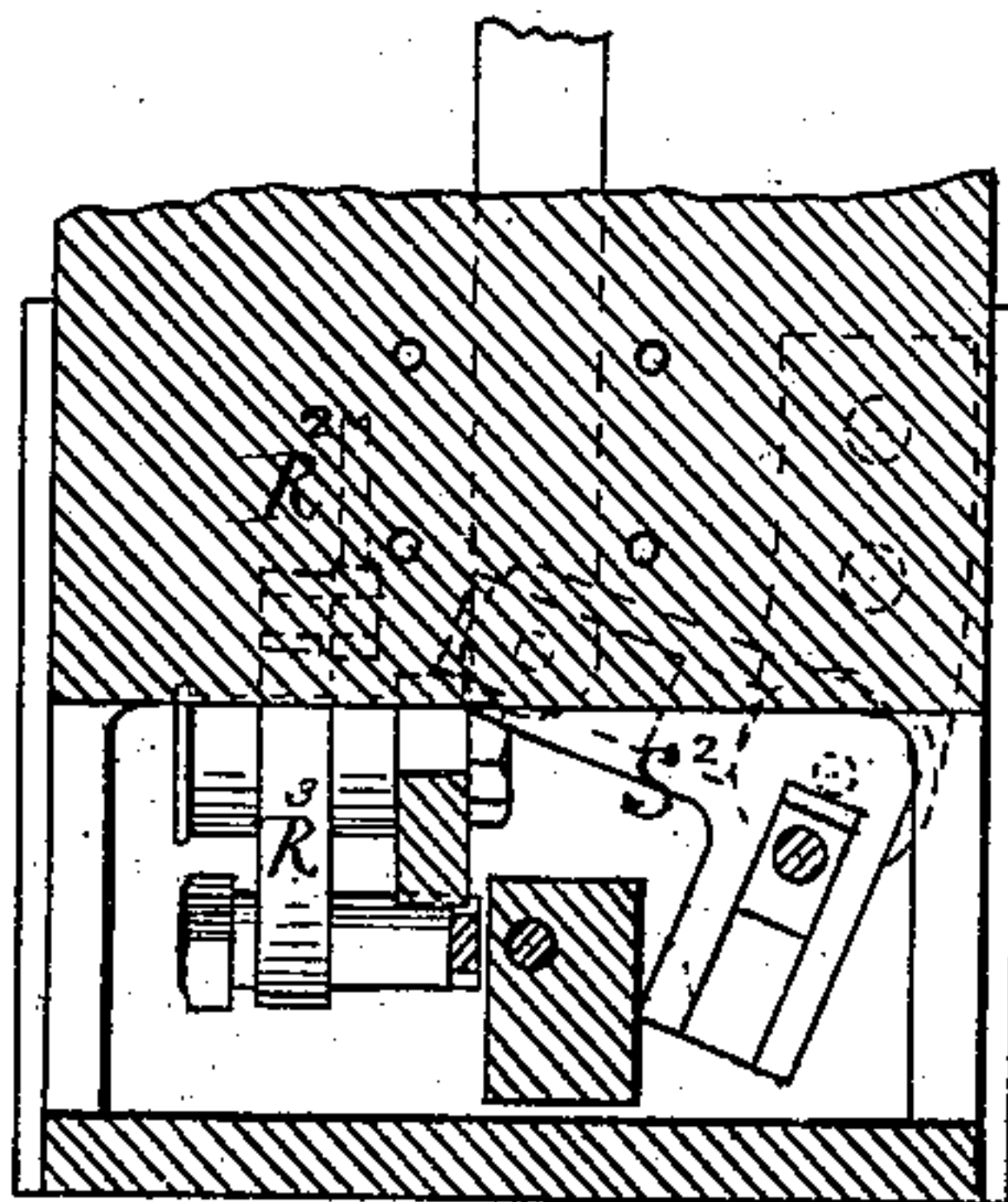


FIG. 9.

WITNESSES.

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H. W. C. Cuming

UNITED STATES PATENT OFFICE.

ALFRED A. CUMING, OF HINGHAM, ASSIGNOR OF ONE-HALF TO EDWARD ARNOLD, OF MARBLEHEAD, AND FRANCIS S. WHITMAN, OF CAMBRIDGE, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 333,201, dated December 29, 1885.

Application filed August 23, 1884. Serial No. 141,338. (No model.)

To all whom it may concern:

Be it known that I, ALFRED A. CUMING, of Hingham, in the county of Plymouth and State of Massachusetts, have invented a new and useful Improvement in Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

This improvement relates to a machine for the purpose of making what I call the "thread-rivet stitch," for which an application for a patent is now pending, Serial No. 138,524.

The mechanical contrivance is shown in connection with an ordinary wax-thread sewing-machine of the kind technically known as a "C-post." The modifications of this machine will be readily understood from the following description and the accompanying drawings, and other well-known machines may be reorganized upon this plan without the exercise of further invention, such, for instance, as the sole-sewing machine employing a "horn" of the McKay, Scott, or Woodward type, or the eye-pointed-needle machines.

In the drawings, Figure 1 is a perspective of the front of a modified C-post machine. Fig. 2 is an enlarged perspective of the head of the machine, the work-plate, and the whirl. Fig. 3 is a perspective of the same parts in another position, and with the work-plate broken away above the whirl. Fig. 4 is a plan of the work-plate and whirl with the work-plate broken away to show the whirl.

The class of machines which already have a whirl, such as the horn-machine used for sole-sewing, and generally similar to what is known as the "McKay" sewing-machine, will receive their modifications almost entirely in the head and the parts attached to the head.

The C-post machine is usually made as a needle-feed machine, or, in other words, the needle and cast-off are in the post part of the machine and not in the head part. In the illustration given the awl is placed in the movable post, and the machine is technically an "awl-feed machine."

Nearly all of the hook-needle machines employ a "cast-off" to mouse the hook of the needle while the thread is in it, so as to make

it secure, that the present loop shall be drawn through the preceding loop of the line of stitches without catching the thread of the preceding loop. In this machine no cast-off is necessary.

Most if not all of the C-post machines place the thread in the hook of the needle by the aid of what is called a "thread-guide," but in this machine a whirl is used for that purpose, and the thread-guide formerly in the head of the machine is modified for passing a secondary thread through a loop just drawn. It has an additional bar with a loop-holder to hold the loop of the secondary thread from being drawn out of the loop of the primary threads by the retreat of this secondary thread-carrier.

In the drawings, A is the head of the machine. B is the movable post. C is the work-plate. D is the needle-bar. *d* is its needle. E is the awl-bar, which may be omitted in machines of the McKay type, and in machines of the eye-pointed-needle type would be the needle-bar. F is the presser-foot. G is the thread-carrier bar for the secondary thread or securing-thread, and *g* is the thread-carrier proper. H is the loop-holder bar, and *h* is the loop-holder of the securing-thread. J is the whirl to lay the primary thread in the eye of the hook-needle *d*, and *j* is the thread-slot in the whirl, and *j*² is the cam-slot in the whirl for the purpose of giving it a vibrating motion in arc around its pivot *j*³, by which it is pivoted to work-plate C, which motion in arc is produced by the reciprocating rectilinear motion of cam-pin *i* from its connection with the feed-carriage of the vibrating post B. The well-known methods of working the whirl of the horn-machine is of course equivalent to this, and, if desired, a thread-carrier of the ordinary form might be used instead.

The revolution of the main shaft of this machine by means of proper cams oscillates post B horizontally, causes the awl-bar E to rise and fall, causes the needle-bar D to rise and fall, causes the presser-foot F to rise and fall, causes the loop-holder bar H to rise and fall, and the thread-carrier bar G to vibrate in arc about its long axis, all at proper times

relatively to each other. These times are as follows: The post B being in a suitable position for taking a stitch, the presser-foot F will be down on the work, the needle *d* lifted away from the work, and the loop-holder *h* down on it, and the whirl J drawn away from the path of the needle with the sewing-thread led up through the slot *j* of the whirl and through the work-plate, and the thread-carrier *g* retracted and threaded with the securing-thread, the machine is started. The awl rises through the work, and the post B then moves, feeding the work till the awl is below the point of the needle *d*. The awl is then retracted, the needle descends through the work in the path made by the awl, the post goes back to its first position, the whirl laying the primary thread in the hook of the needle, which then retracts, drawing the loop of primary thread *k*, Fig. 2, through the work and to the proper height, the loop-holder *h* lifting about the same time. Next the thread carrier *g* carries the securing-thread *l*, Fig. 2, through the primary loop, and the loop-holder *h* then descends through the loop of the securing-thread *l* and holds it while the thread-carrier *g* retreats. At the time the loop of thread *l* passes through the loop of thread *k* the needle *d* descends a little, and the loop of thread *k* drops off the hook of the needle *d*. It will thus be seen that the loop-holder bar H can be worked by lifting-offsets on the needle-bar D, as is usual with the presser-foot of wax-thread machines, the needle-carrier bar G can be worked by the usual thread-guide cam, the presser-foot F by customary offsets, but that the combination of these various parts and their action to make a new article is a new combination, and that the loop-holder *h* is a new tool in its relation to the throat of a sewing-machine, while the place of action of the thread-carrier *g* is quite distinct from that of the former thread-guide, since that passed in front of the needle and carried the sewing-thread round the shank of the needle, and this passes by the side of the needle and carries the securing-thread past the side of the needle. The duty done by the thread-guide of the old C-post machine in laying the stitching-thread in the hook of the needle is done by the whirl J in this modification.

Figs. 5, 7, 8, and 9 show the connection of the operative parts already described with the main shaft of the machine, and illustrate the manner in which the described motions are given to the working of the machine at or about the work-plate. Figs. 6 and 10 are enlarged views of the work-plate and parts beneath it, Fig. 10 being an enlargement in the same aspect as Fig. 7, and Fig. 6 being an enlargement in the same aspect as Fig. 5. Fig. 8 is an enlarged sectional view on the line *xx* of Fig. 7. Fig. 9 is an enlarged sectional view on the line *yy* of Fig. 7.

The needle-bar D is operated through the rock-lever O² by the grooved cam O¹ from the main shaft O, and the cut of the cam O¹ gives to

the needle-bar D the reciprocating motions already described. The cam P is a face-cam, and serves to actuate the two levers Q¹ and Q² through the linkage Q and P¹. The lever Q¹ gives to the loop-holder bar H its reciprocating vertical motion and pauses; or, as previously said, this loop-holder bar H may be worked by lifting offsets on the needle-bar D. The lever Q² lifts and lowers the presser-foot F. In addition to the offset actuating the loop-holder H, another offset from the lever Q¹ lays hold of a spirally-grooved cam in the thread-carrier bar G, and oscillates it in a way usual in the C-post machine. The cam R on the same shaft O lays hold of a cam-pin in the lever R¹ and oscillates the said lever in a direction parallel to the axis of the main shaft. From the end of the lever R¹ a link, R², conveys the reciprocating motion parallel to the main shaft to the bent lever R³, which lays hold of the awl-bar E and reciprocates it up and down vertically. Slots in the lever R¹ and R³ allow lost motion sufficient to prevent these parts from binding, and, as shown in Fig. 9, these parts are so arranged as to permit the movable post B to be reciprocated transversely of the machine and thus space the stitching. To produce this transverse reciprocation of the movements of the post B, the cam S on the main shaft O is provided. The cam-pin, engaging with the groove on the edge of the cam S, communicates a reciprocating horizontal motion with proper pauses through the link S¹ to the bent lever S², which engages with the movable post B and reciprocates it transversely of the main shaft of the machine.

A great variety of cam-actuated devices are in use on post-machines to produce substantially the motions herein described. Sometimes the post, instead of being reciprocated in a right line, is oscillated on a fulcrum at the base of the machine, in which case the needle or awl is not thrown into the material, and drawn out from the material on parallel lines, but on lines that diverge from each other at the work-plate; but, as already stated, the nature of my invention, and the necessary mechanism to practice it, is grouped around the work-plate of the machine, and the mechanism to give the working parts which make the stitch their reciprocation and pauses are matters of mechanical detail, which can be readily understood, and are subject to almost infinite variation by any skillful constructor of sewing-machines, and involve merely the laying out and cutting of proper cams, and the use of proper levers and linkages to connect the cams with the working parts and transmit the continuous motion in one direction of the main shaft, converted into the proper reciprocating motions and pauses, to what may be called the "fingers" of the machine which handle the thread.

The Grover & Baker stitching mechanism, to which this has some analogy, has no loop-holder, *h*, and its shuttle, needle, or thread-carrier is adapted to move so that the loops of

each of the threads shall be moused by the standing parts of the other, making a corded lock-stitch. This Grover & Baker stitch presents a triple line of securing-thread on one side of the work, while the stitch made by the new mechanism presents only a single line of such thread with transverse loops at each stitch.

The mechanism shown in the drawings represents a hook-needle, *d*. The thread will always lead from opposite sides of the work-plate C, and if a hook-needle is used the needle, secondary thread-carrier *g*, and loop-holder *h* will form a group actuated from the one and the same side of the work-plate C, while the whirl J, or its equivalent thread-guide and awl, if any be used, will be actuated from the opposite side of the work-plate C from the first-named group. If, however, an eye-pointed needle be used, the first group will consist only of the thread-guide *g* and loop-holder *h*, and the group actuated from the opposite side of the work-plate will be composed only of the eye-pointed needle, and no whirl will be required. Proper tension will be put upon the threads whatever form of stitching mechanism is adopted. The puncturing instruments, needle of whatever sort, and awl, work in a throat in the work-plate C, as is usual, and the presser-foot may be forked, perforated, or disposed alongside of the throat, as is common with this part.

I claim as my invention and desire to secure by Letters Patent—

The combination, in a sewing-machine for the purpose of making a stitch with two threads, one of which traverses the material to be stitched from surface to surface, and lies in the material double, and the other of which is thrust in loops through the bights of the

thread which traverses the material, of a needle which is reciprocated through the material and carries a loop of thread from one side of the material to the other, an apparatus which supplies thread to the eye of the needle situated to one side of the material, a thread-carrier, *g*, situated on the other side of the material and reciprocated through the loop of the first thread, a loop-holder, *h*, also situated on the same side of the material as the thread-carrier *g*, and reciprocated with an intermediate rest through the loop of the second thread, arranged to be actuated as follows: when the needle is carrying thread through the material, the thread-carrier is still or only beginning its movement toward the loop of primary thread, but the loop-holder is in position through the loop of secondary or securing thread until the previous stitch is tightened; when the needle has made its full throw through the material and begins to descend, the thread-carrier is moved to traverse the loop of primary thread, and the loop-holder is raised; and when the thread-carrier has made its full throw the loop-holder *h* is depressed through the loop of thread presented by the thread-carrier and remains stationary while the thread-carrier is withdrawn, the needle reciprocated to its thread-taking position, and the needle again traverses the material, carrying a loop of thread through it, substantially as described, all operating together, and with the work-plate of the sewing-machine and the presser-foot thereof and feed movement thereof, to produce the stitch referred to.

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Witnesses:

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