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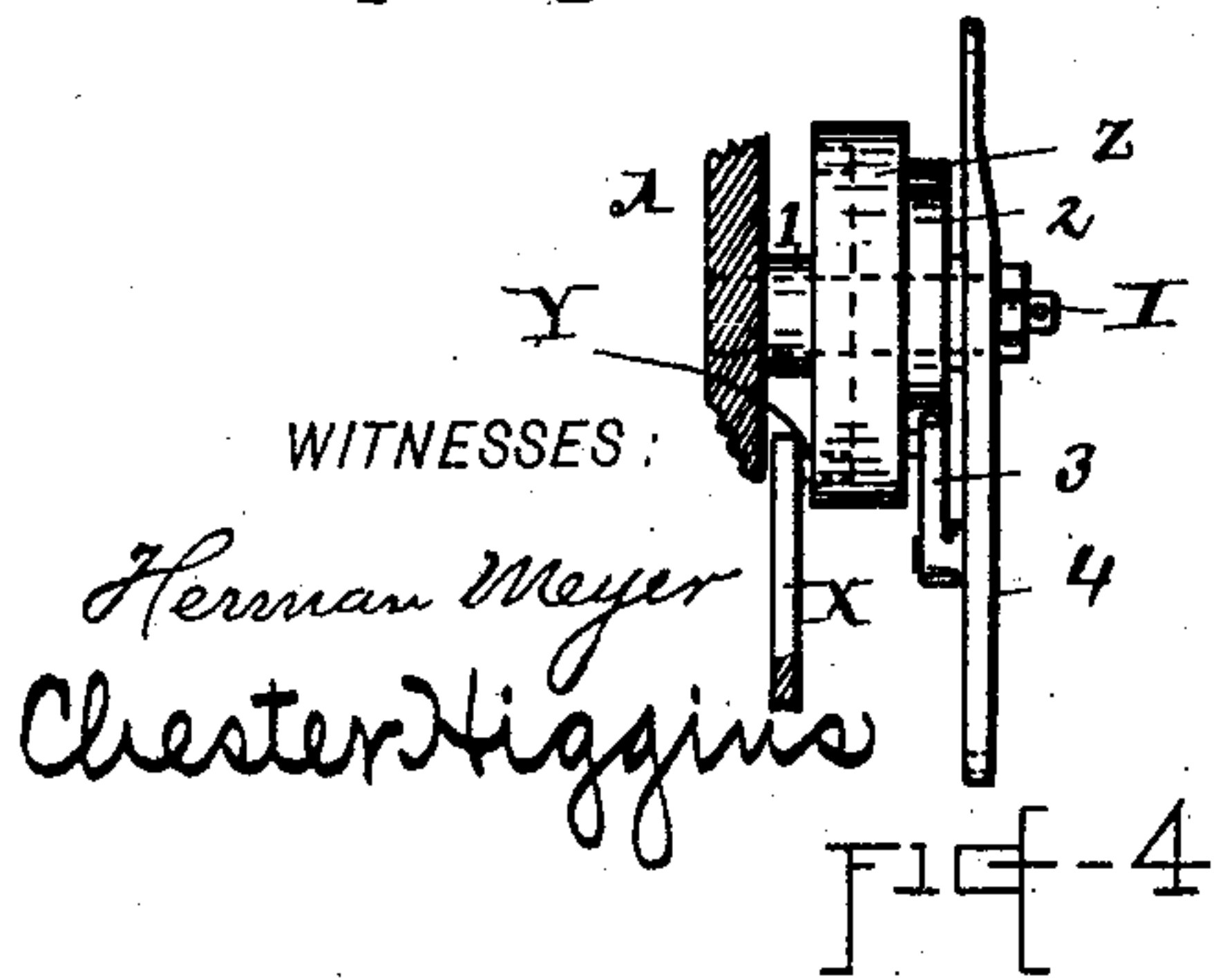
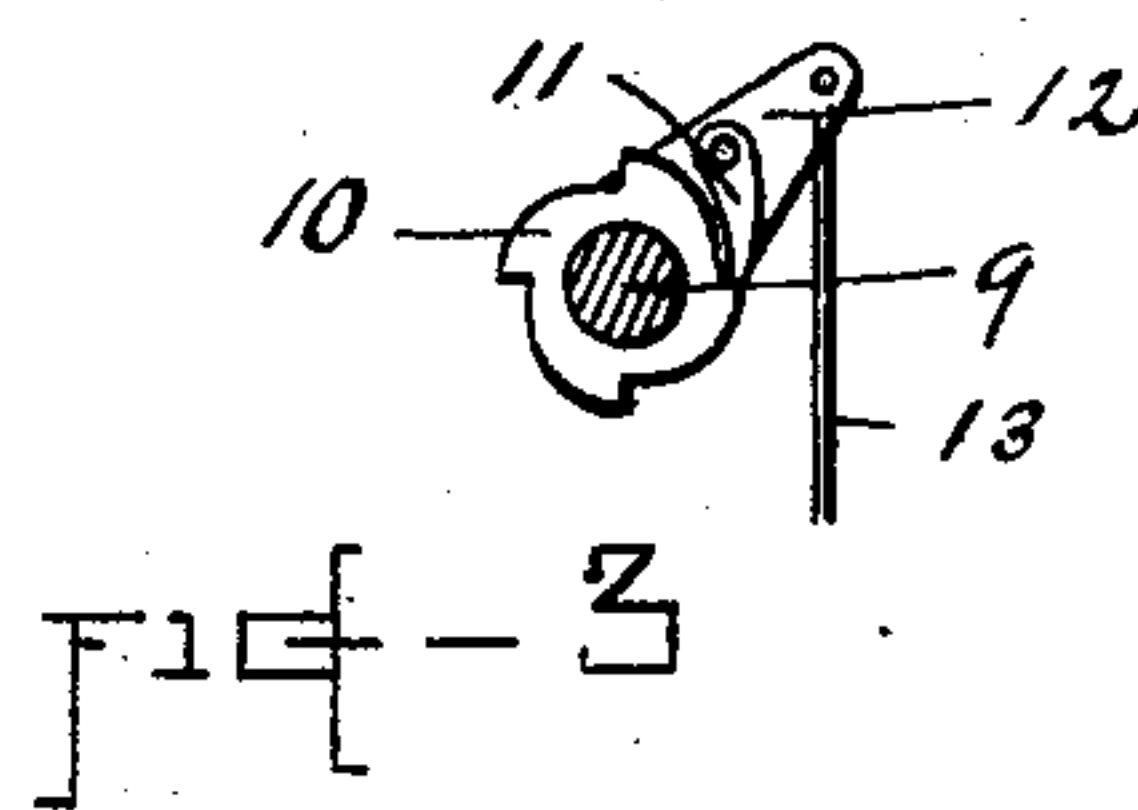
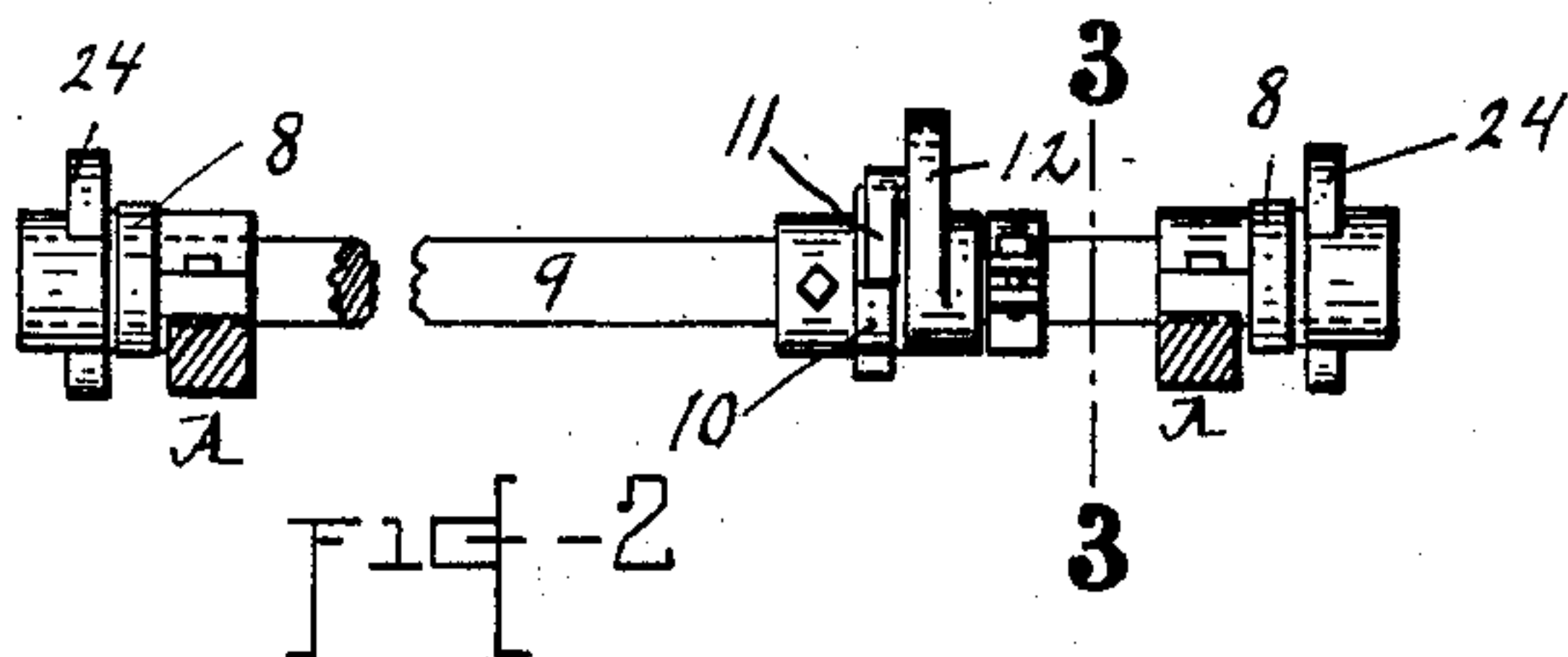
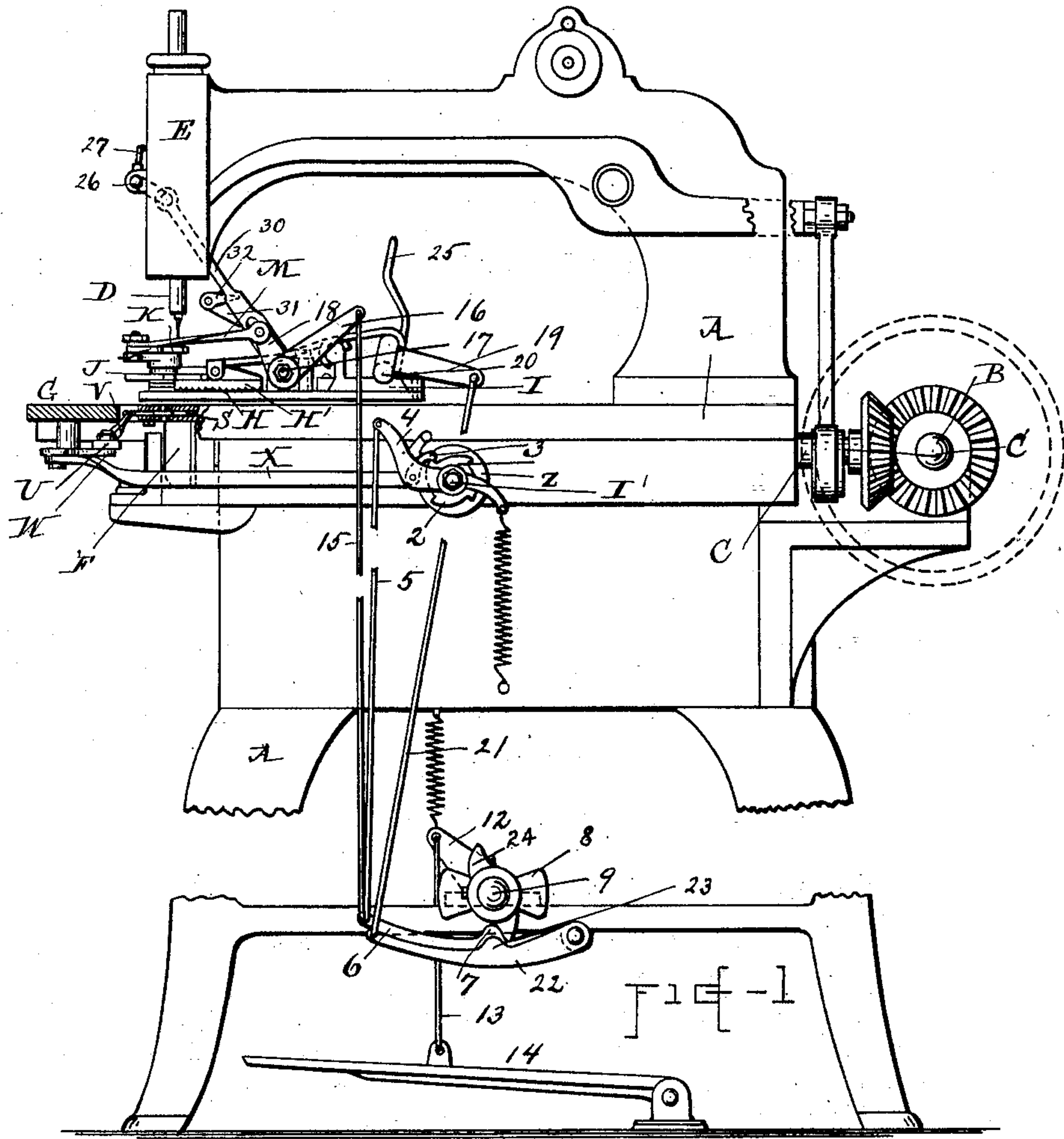
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H. E. HAWES.

THREAD TRIMMING DEVICE FOR SEWING MACHINES.

No. 603,688.

Patented May 10, 1898.



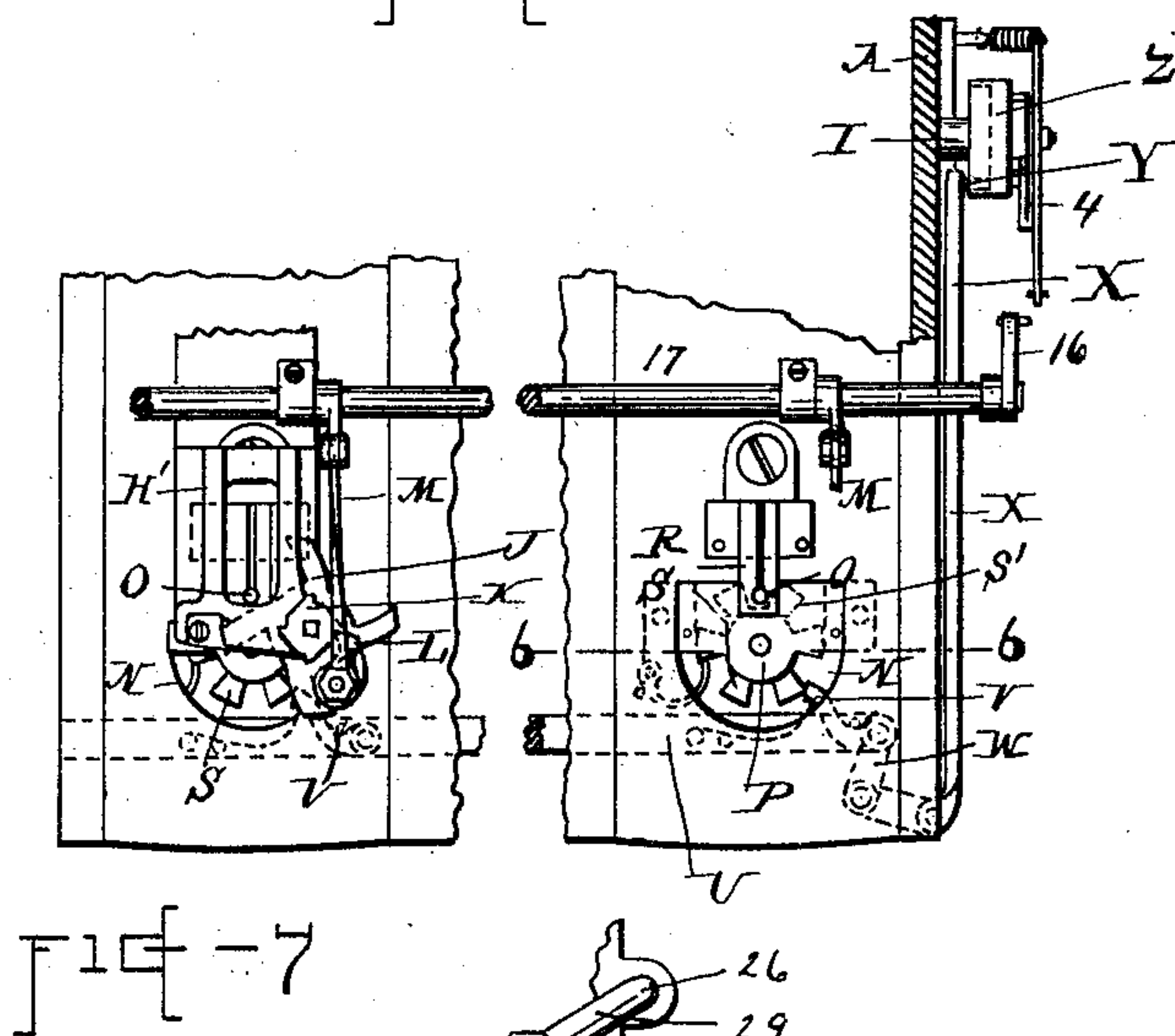
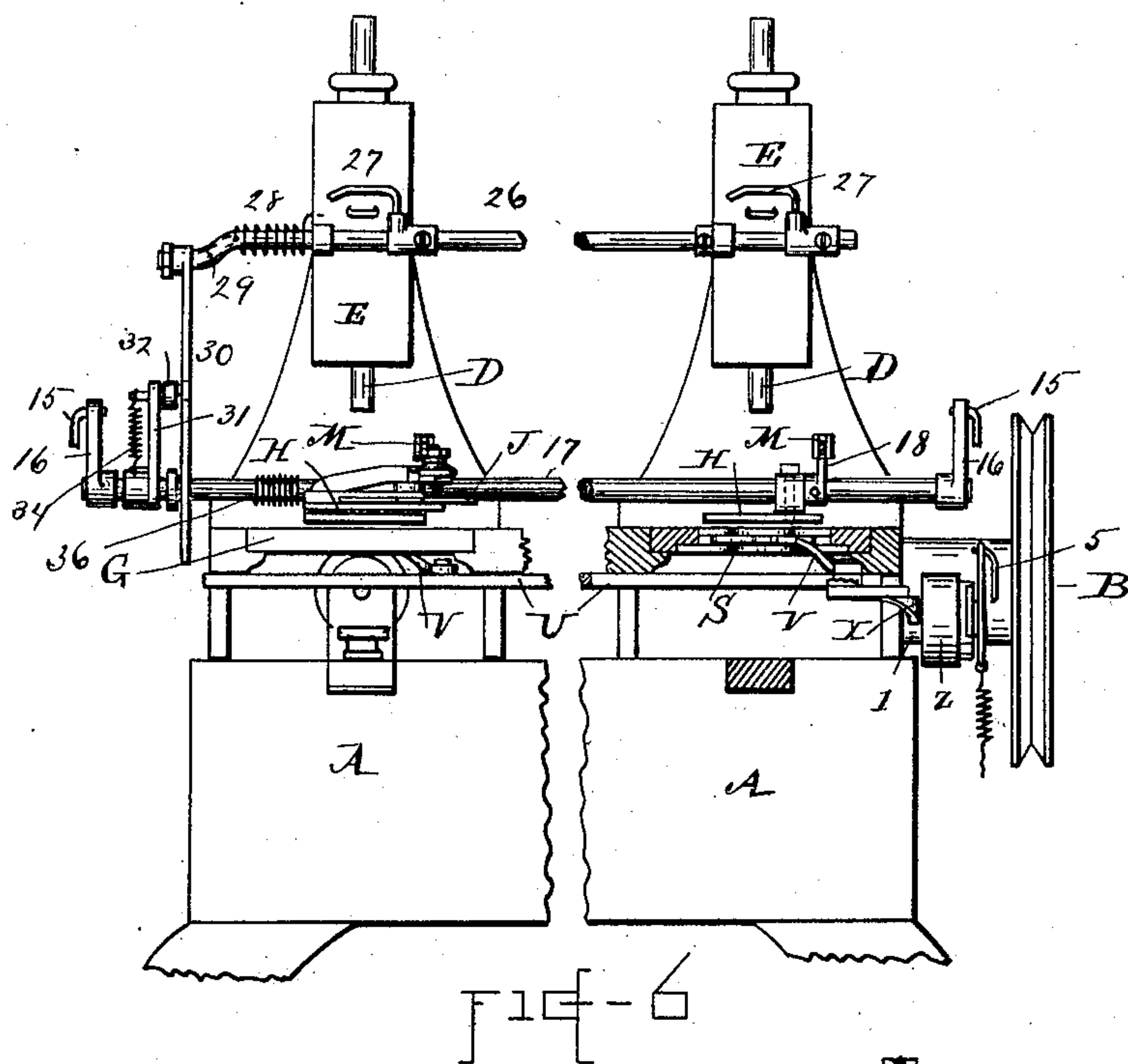
Herbert E. Hawes
INVENTOR

BY *Clarence A. Bingham*
ATTORNEY.

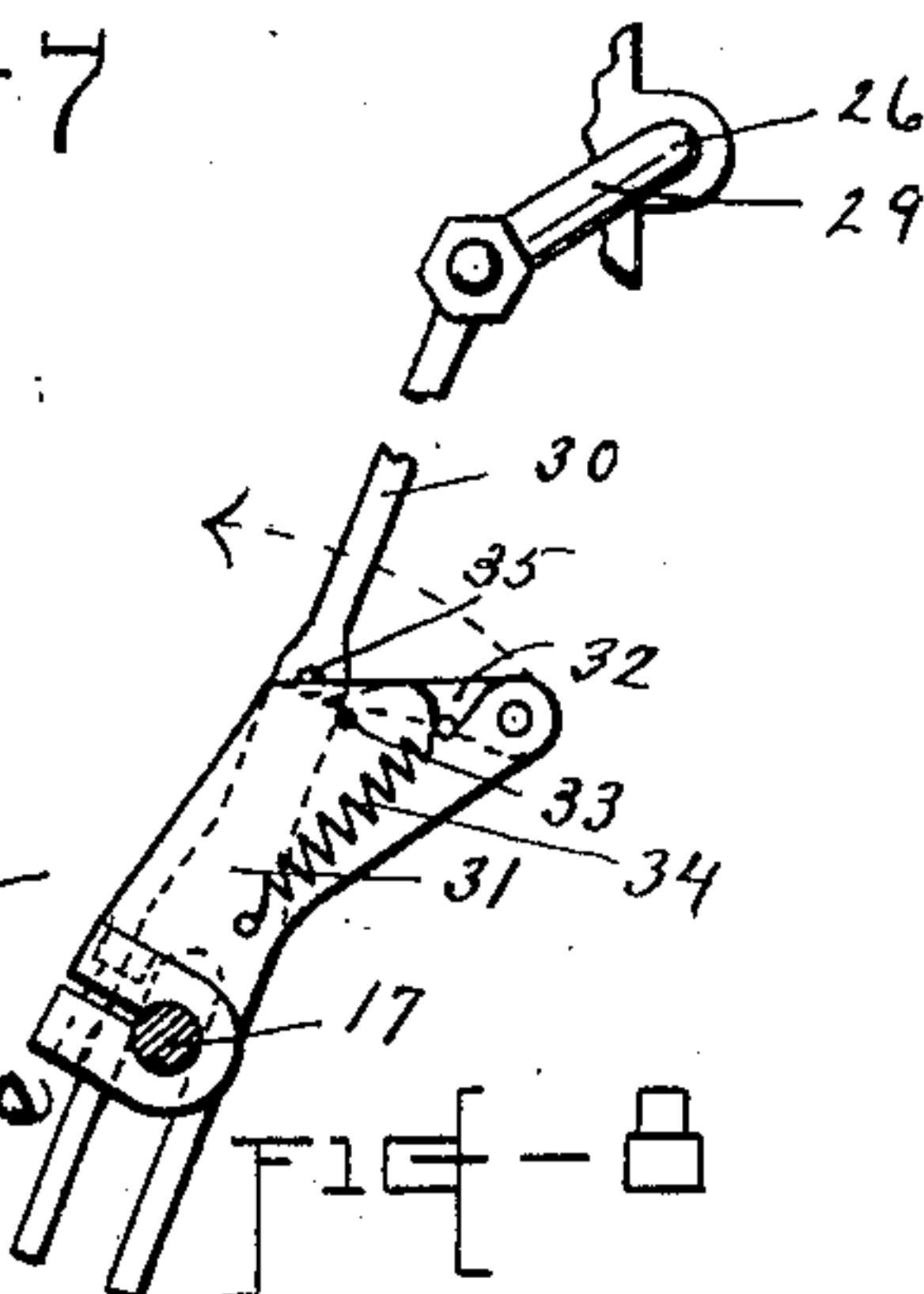
(No Model.)

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H. E. HAWES.
THREAD TRIMMING DEVICE FOR SEWING MACHINES.
No. 603,688. Patented May 10, 1898.



WITNESSES:
Hermann Meyer
Chester Higgins



Herbert E. Hawes
INVENTOR

BY Clarence A. Rogers
ATTORNEY.

(No Model.)

3 Sheets—Sheet 3.

H. E. HAWES.

THREAD TRIMMING DEVICE FOR SEWING MACHINES.

No. 603,688.

Patented May 10, 1898.

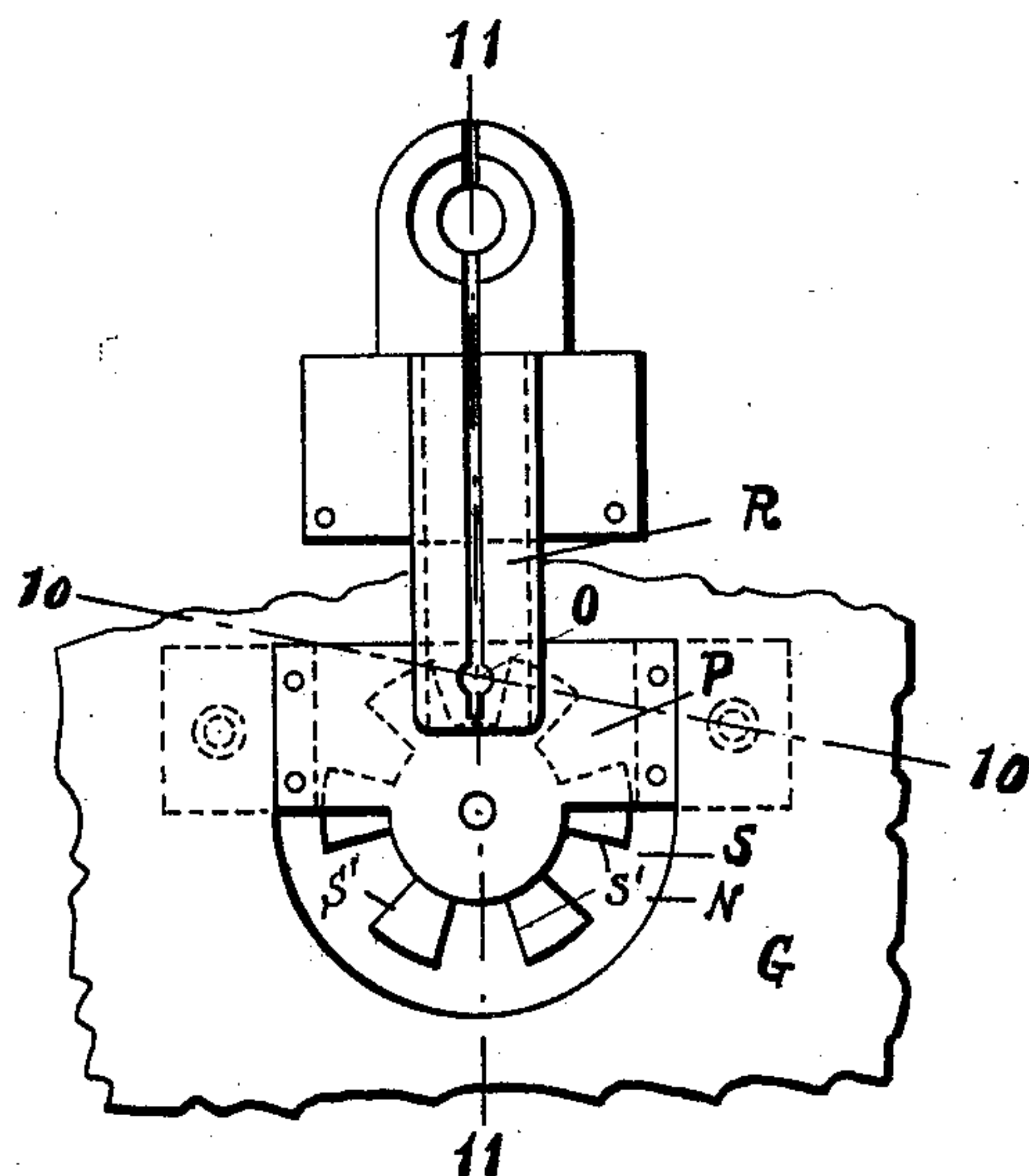


Fig. 9

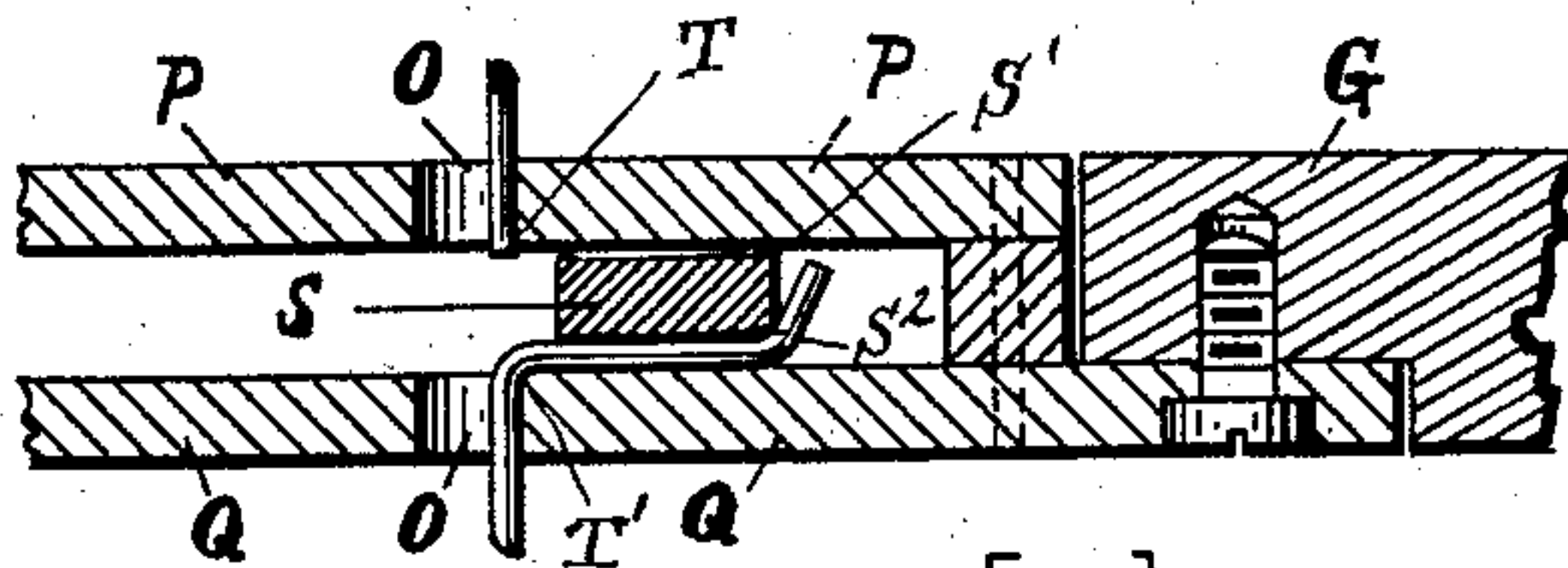


Fig. 10

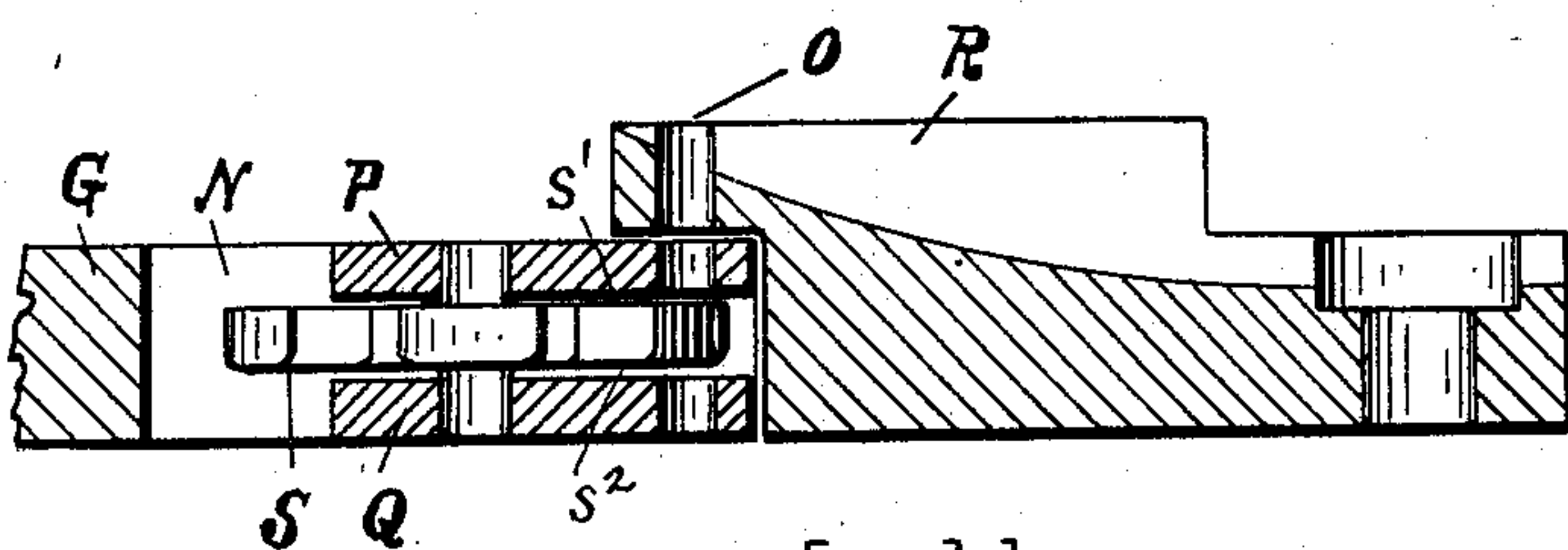


Fig. 11

WITNESSES:

Chas R Fitch
Chester Higgins

Herbert E Hawes

INVENTOR

BY *Clarence King*

ATTORNEY.

UNITED STATES PATENT OFFICE.

HERBERT E. HAWES, OF BROOKLYN, NEW YORK, ASSIGNOR TO COLBY & CO., OF SAME PLACE.

THREAD-TRIMMING DEVICE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 603,688, dated May 10, 1898.

Application filed March 16, 1897. Serial No. 627,746. (No model.)

To all whom it may concern:

Be it known that I, HERBERT E. HAWES, a citizen of the United States, residing in the city of Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Thread-Trimming Devices for Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to sewing-machines, and among its principal purposes are to cut the under or shuttle thread of double-thread sewing-machines as well as the upper thread from the work on the completion of the stitching operation; to hold the severed end of the under thread, as well as the upper thread, until after the next stitching operation is commenced; to, in buttonhole-machines on the completion of each buttonhole, cut the held initial threads as well as the final threads, both under and upper, from the work; to pull the held upper thread before stitching, so as to give the needle sufficient thread with which to commence work; to effect the operation of the presser-foot and the upper and under thread cutters and the thread-puller at the proper time and in a convenient manner; to operate the several thread-cutters, thread-holders, and thread-pullers, respectively, of a multiple-buttonhole-sewing machine simultaneously, and to effect these various purposes in a simple and practical manner. I accomplish these and other objects by the various features of my invention, and in order that it may be clearly understood I shall describe in detail the mode in which the invention is carried into practice and then point out its various features in the claims.

Reference is to be had to the accompanying drawings, forming part of this specification, in which the same parts are designated by like characters in all the figures.

Figure 1 represents in side elevation a multiple-buttonhole-sewing machine which I have equipped with my invention. Figs. 2, 3, 4, and 5 are enlarged detail views of certain parts of the same, hereinafter referred to. Fig. 6 is a front elevation of the same, showing the two end component buttonhole-sewing mechanisms, the intermediate sewing

mechanisms being omitted for the sake of brevity. Fig. 7 is a plan view of the same, parts being omitted. Figs. 8, 9, 10, and 11 are enlarged detail views of parts hereinafter referred to.

A designates the frame of a multiple-buttonhole-sewing machine in which I reduced my invention to practice and which is in its main features like that described in Letters Patent No. 441,058, granted to Thomas E. Colby November 18, 1890.

B is the common driving-shaft.

C are the individual main shafts of the component two-thread-sewing mechanisms, of which there are actually eight on this particular machine.

D are the individual needle-bars, and E their vertical guides.

F are the shuttles.

G are the cloth-plates.

H are the work-clamps, and H' the presser-feet thereof, and I is the common work-clamp carrier, to which the several work-clamps are attached and by which and a common buttonhole-feed mechanism they are simultaneously given as one clamp a buttonhole-feed motion.

J is the thread cutter and clamp, mounted in each presser-foot H', for trimming the initial and final upper or needle threads from the buttonhole and holding the needle end for the next buttonhole, substantially as described in Letters Patent No. 561,766, granted to Charles H. Colby and Thomas E. Colby June 9, 1896.

K is the ratchet-wheel, L the pawl, and M the pawl-reciprocating link for actuating each said thread cutter and clamp, substantially as described in said Patent No. 561,766.

To trim the under thread as well as the upper thread from the work required a large amount of study and experimentation on my part, as owing to the different surroundings and circumstances I could not use the upper-thread-cutter-actuating mechanism described or any known thread-cutter-actuating mechanism for this purpose. I finally found it preferable to use the above-described thread cutter and clamp patented by Colby and Colby, locating it in the cloth-plate, and I ef-

fected this in the machine described as follows: In each cloth-plate G, I cut an opening N in front of the needle-hole O, and in the rear of said opening I fixed thin upper and lower bearings P Q level with the top and bottom, respectively, of the cloth-plate, so as not to interfere with the work-clamp above and the shuttle mechanism below. The needle-hole O was formed through the bearings P Q and in an anvil R, slotted to receive the blade of the buttonhole-cutter, substantially as described in another application for patent filed in the Patent Office, Serial No. 618,804. In and between the bearings P Q, I mounted a rotary thread cutting and clamping device S, substantially like the upper-thread cutter and clamp J, having a number of radial wings with upper-thread-cutting edges S' and lower rounded thread-clamping edges S² to swing across the needle-hole O and cooperate, respectively, with the fixed cutting edge T and the fixed rounded clamping edge T' of the bearings P Q in the cloth-plate. The cooperating cutting edges S' and T thus cut off the under threads of the stitched buttonhole closely thereto, and the clamping edges S² and T' clamp the severed shuttle end of the thread. To properly operate each cutting and clamping piece S and to operate them all simultaneously, I arranged a stretcher U to extend and reciprocate lengthwise across and beneath the several cloth-plates G and provided the stretcher with a spring-pressed finger V for each piece S to extend upward into the openings N and engage, as a pawl does a ratchet-wheel, the corresponding radial wings of the pieces S, so that when the stretcher U is reciprocated in one direction on the completion of one set of buttonholes it will swing the cutting and clamping edges S' S² of the pieces S across the needle-holes O, cut and clamp the under threads, as described, and bring the next cutting and clamping edges into position. On the reverse movement of the stretcher it will not move the pieces S; but when operated on the completion of the next set of buttonholes the succeeding cutting and clamping edges of the pieces S will cut both the initial and final under threads from the buttonholes and at the same time hold the shuttle-threads for the next sewing operation, as before.

To conveniently reciprocate the stretcher U and to operate all the under and upper thread cutters and clamps at the same time, I connected one end of the same with an elbow-lever W, pivoted to the under side of the cloth-plate G of the end sewing mechanism and connected by a pitman X with a cam-follower Y, actuated by a cam Z, rotating on a short shaft 1 on the frame A of the machine. To the cam Z, I attached a ratchet-wheel 2, which is intermittently actuated by a pawl 3 on a spring-retained lever 4, rocking on the shaft I', and I connected the lever 4 by a rod 5 with a lever 6, pivoted on the frame A and having a cam-following projec-

tion 7, actuated by a cam 8, fixed on a shaft 9, mounted transversely in the frame A. On the shaft 9 I fixed a ratchet-wheel 10, actuated by a pawl 11 on a spring-retained lever 12, connected by a rod 13 with a treadle 14.

I further provided a duplicate cam-following lever 6 and cam 8 on the opposite end of the machine and of the shaft 9 and connected said levers 6 by rods 15 with the end arms 16 of a rock-shaft 17, extending across and mounted on the connected work-clamps H and having arms 18, connected with the actuating-links M of the upper-thread cutters and clamps J before referred to. By this arrangement when the operator depresses the treadle 14 on the completion of a set of buttonholes the ratchet-wheel 10 will be rotated one tooth, the levers 6 will be depressed by the cams 8, the rods 15 will operate the upper-thread cutters and clamps, and the rod 5 will rotate the ratchet-wheel 2 one tooth and thereby partially rotate the cam Z, reciprocate the stretcher U, and simultaneously operate the under-thread trimmers and clamps, as previously described.

To operate the several presser-feet H' in harmony with the upper and lower thread cutters and clamps, I connect the end arms 19 of the transverse rock-shaft 20, which clamps the several presser-feet simultaneously, as described in Letters Patent No. 441,058, before referred to, by rods 21 with levers 22, (only one shown,) pivoted on opposite ends of the frame of the machine and having cam-following projections 23, actuated by cams 24 on the before-described shaft 9. The said rock-shaft 20 is widened along its length to form a continuous cam, which engages the rearward extensions of the arms of all the presser-feet H' and throws and locks said presser-feet down when the rock-shaft 20 is rocked by the arms 19, rods 21, cam-levers 22, and cams 24 described. The arrangement is such that on commencing work the operator introduces the work—in this instance, waistband to be buttonholed—beneath the several presser-feet H' and then depresses the treadle 14, causing the cams 24 to clamp the presser-feet on the work by the connections just described. The operator then starts the buttonhole-stitching mechanism, and the buttonholes are simultaneously stitched. The operator then again depresses the treadle 14, which causes the cams 8 to operate the upper and lower thread cutting and clamping devices simultaneously through the cam-levers 7, rods 5 and 15, and connections, as described, and the operator then raises the presser-feet, which remain locked in clamping position by the cam-shaft 20 even after the cams 24 pass the cam projections 22, as by means of a handle-arm 25 on the clamping-shaft 20, and removes the work. To simultaneously slack the upper threads between the thread-supply devices and the needles, I mounted a transverse rock-shaft 26 transversely on and across the several

needle-bar guides E, said shaft having bent arms 27 to pull out the thread when the shaft is rocked and a spring 28 to return it.

The shaft 26 has an arm 29, pivoted to a bar 30, having a forked lower end receiving the upper-thread-trimmer-operating shaft 17. On the shaft 17 is fixed an arm 31, to which is pivoted a cam-piece 32, normally held down against a stop-pin 33, fixed to the arm 31, by a spring 34, as best shown in Fig. 8. When the arm 31 is swung forward in the direction indicated by the arrow in said figure, by rocking the shaft 17 to operate the upper-thread trimmers J, as before described, on completion of the buttonholes the upper edge of the cam-piece 32 engages and actuates a pin 35, fixed on the bar 30, so as to raise the bar 30, rock the shaft 26, and operate the thread-pullers 27, as before described. This occurs just before the threads are severed. As the cam-piece 32 passes completely under the pin 35 the bar 30 is immediately lowered again and the thread-pullers 27 returned to their normal position by the spring 28. Then as the rock-shaft 17 is returned to its normal position by a spring 36 on said rock-shaft the arm 31 swings backward and the cam-piece 32 returns over the pin 35 to its normal position. (Shown in Fig. 8.) Sufficient thread is thus pulled from the upper-thread supply before the trimming to relieve the strain on the upper thread during the commencement of the next buttonhole-stitching.

I claim as my invention—

1. The combination, with a sewing-machine

cloth-plate, of a winged thread-cutting piece mounted to revolve therein unidirectionally across the needle-hole, so as to cut the under thread, and a finger or pawl and its operating means to intermittently engage and rotate the wings of the thread-cutting piece in the cloth-plate.

2. The combination with the work-clamp and the cloth-plate of a two-thread sewing-machine, of rotatable thread-cutting pieces mounted in said cloth-plate and having wings designed to move between the needle-holes of both said work-clamp and cloth-plate, a rotatable shaft having cams mounted thereon, arms engaging said cams and adapted to operate said thread-cutting pieces, and means for operating said shaft, substantially as set forth.

3. The combination with the presser-foot of a sewing-machine and a thread-cutting device, of a cam, cam-follower, and connections to operate the presser-foot, another cam, cam-follower and connections to operate the thread-cutting device, and a primary operator, as a treadle, and connections to cause said cams to actuate their followers and hence the presser-foot and thread-cutting device in alternation.

In testimony whereof I have hereunto set my hand this 9th day of March, 1897.

HERBERT E. HAWES.

In presence of—

FRANCIS E. ROGERS,
SIDNEY A. BERRY.