

No. 614,106.

Patented Nov. 15, 1898.

I. HOLDEN.
BUTTONHOLE SEWING MACHINE.

(Application filed June 4, 1897.)

(No Model.)

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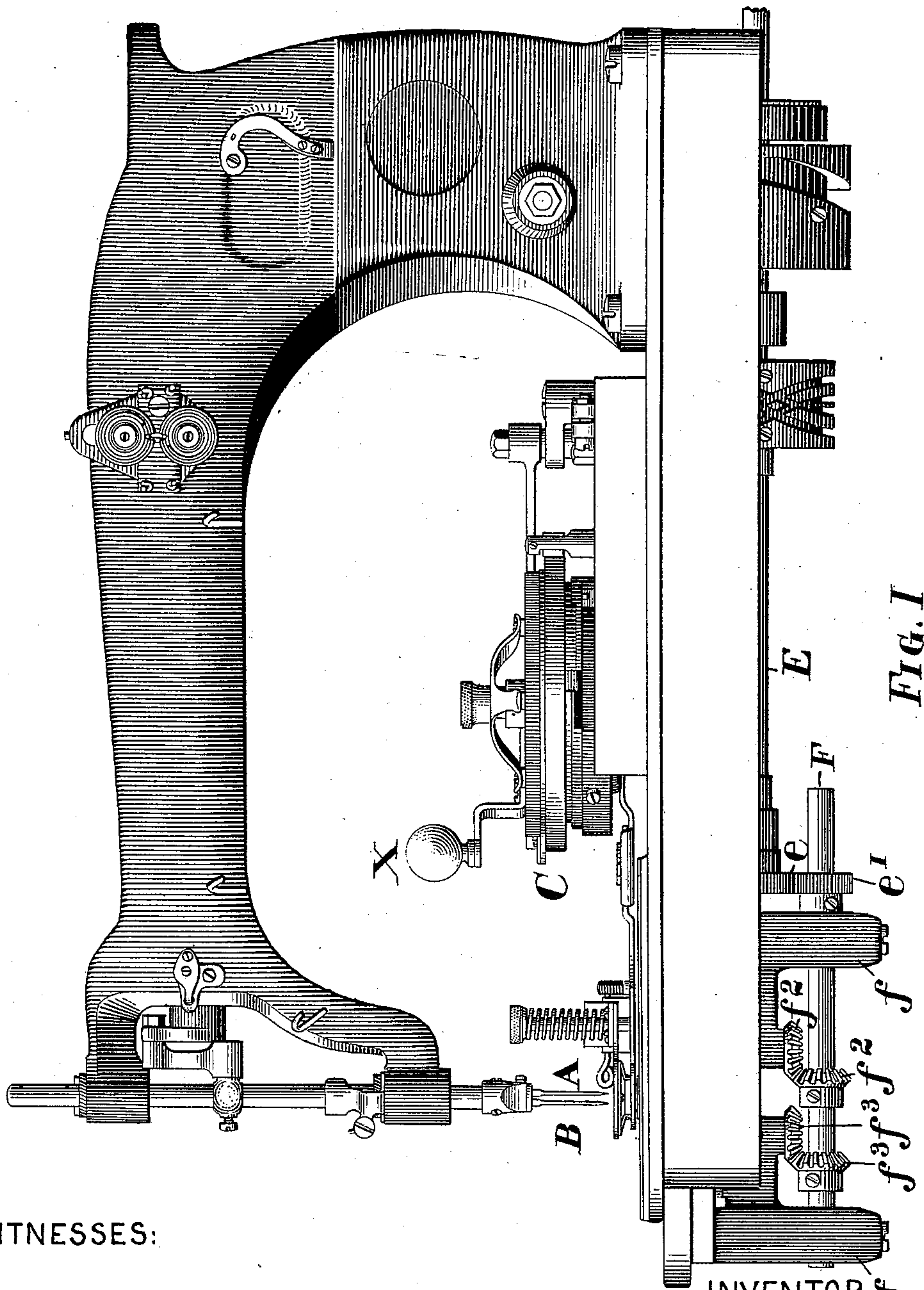


FIG. 1

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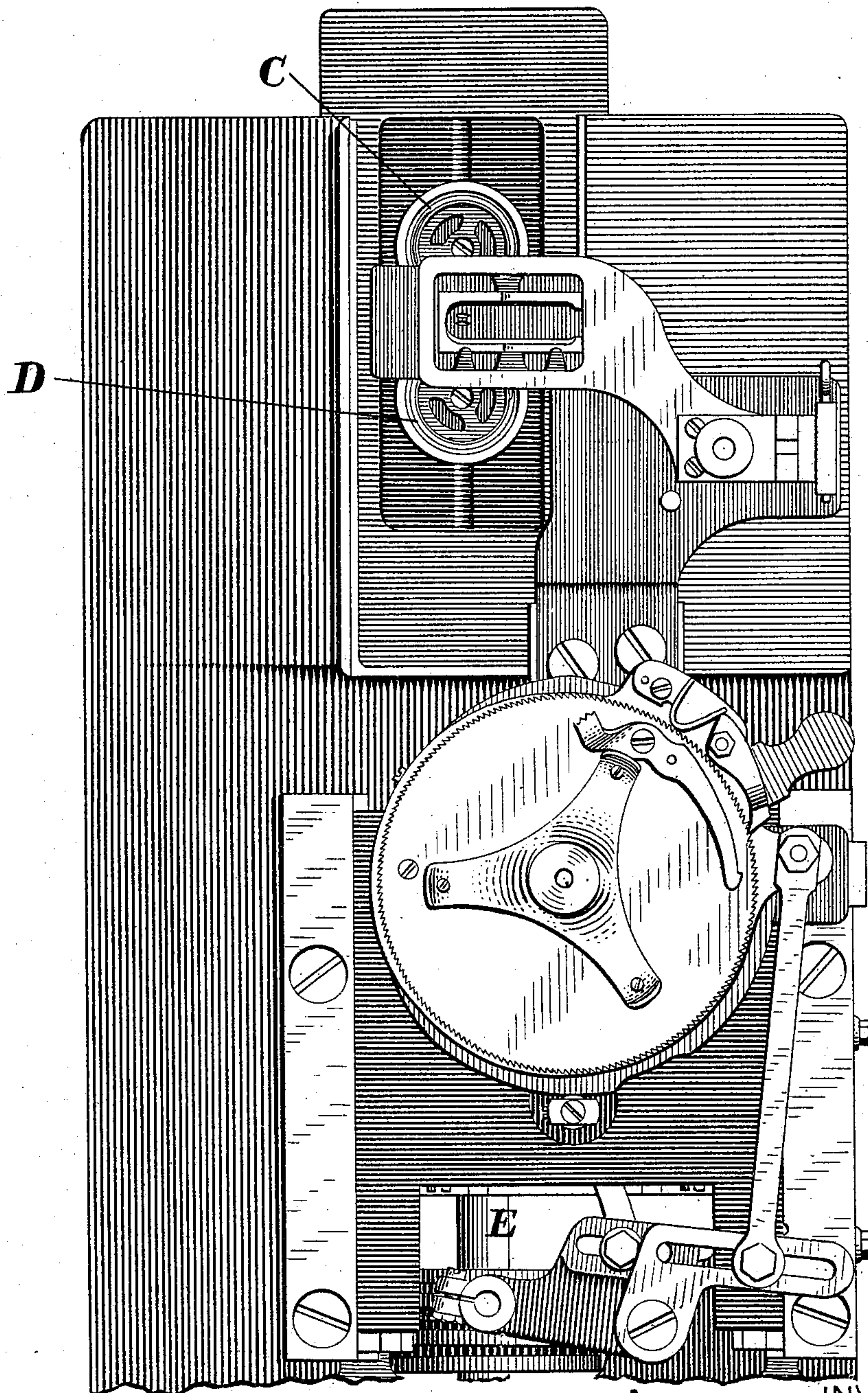
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FIG. 2



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FIG. 3

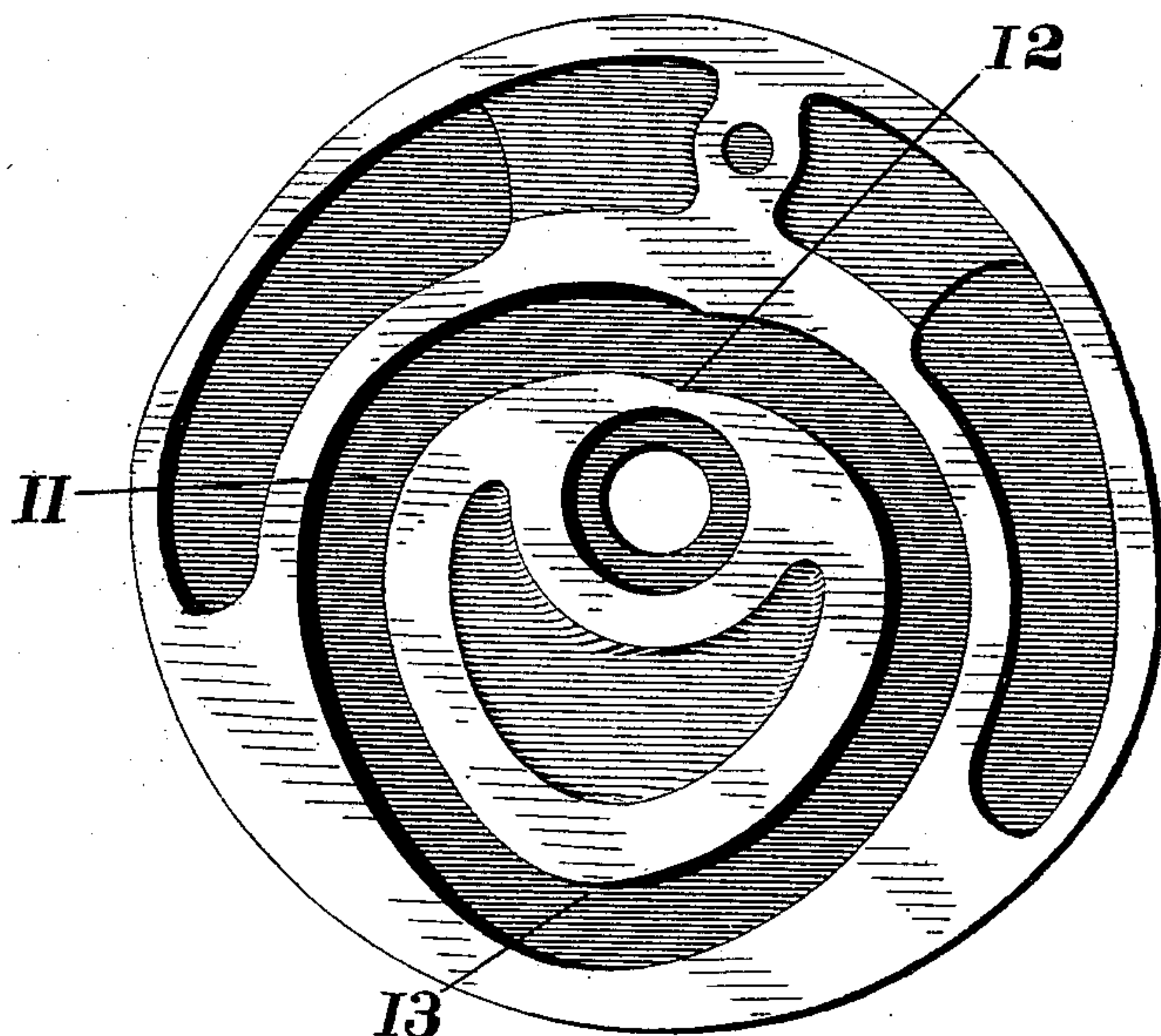


FIG. 6

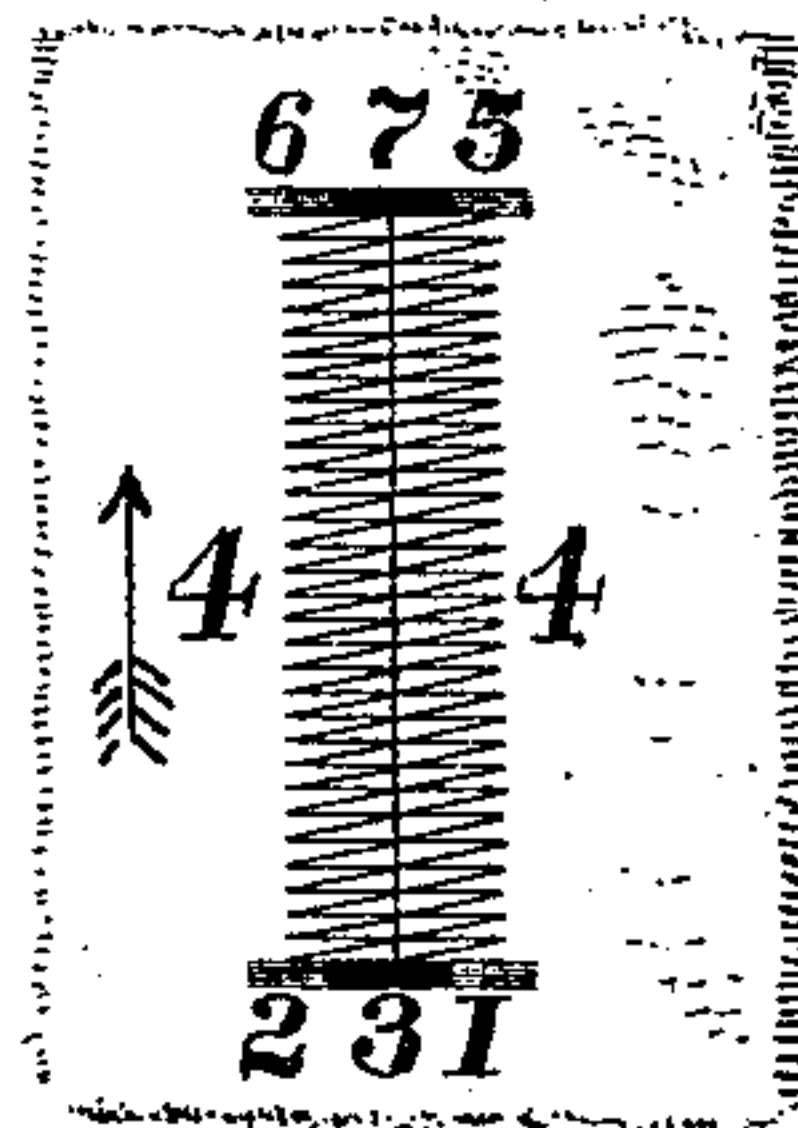
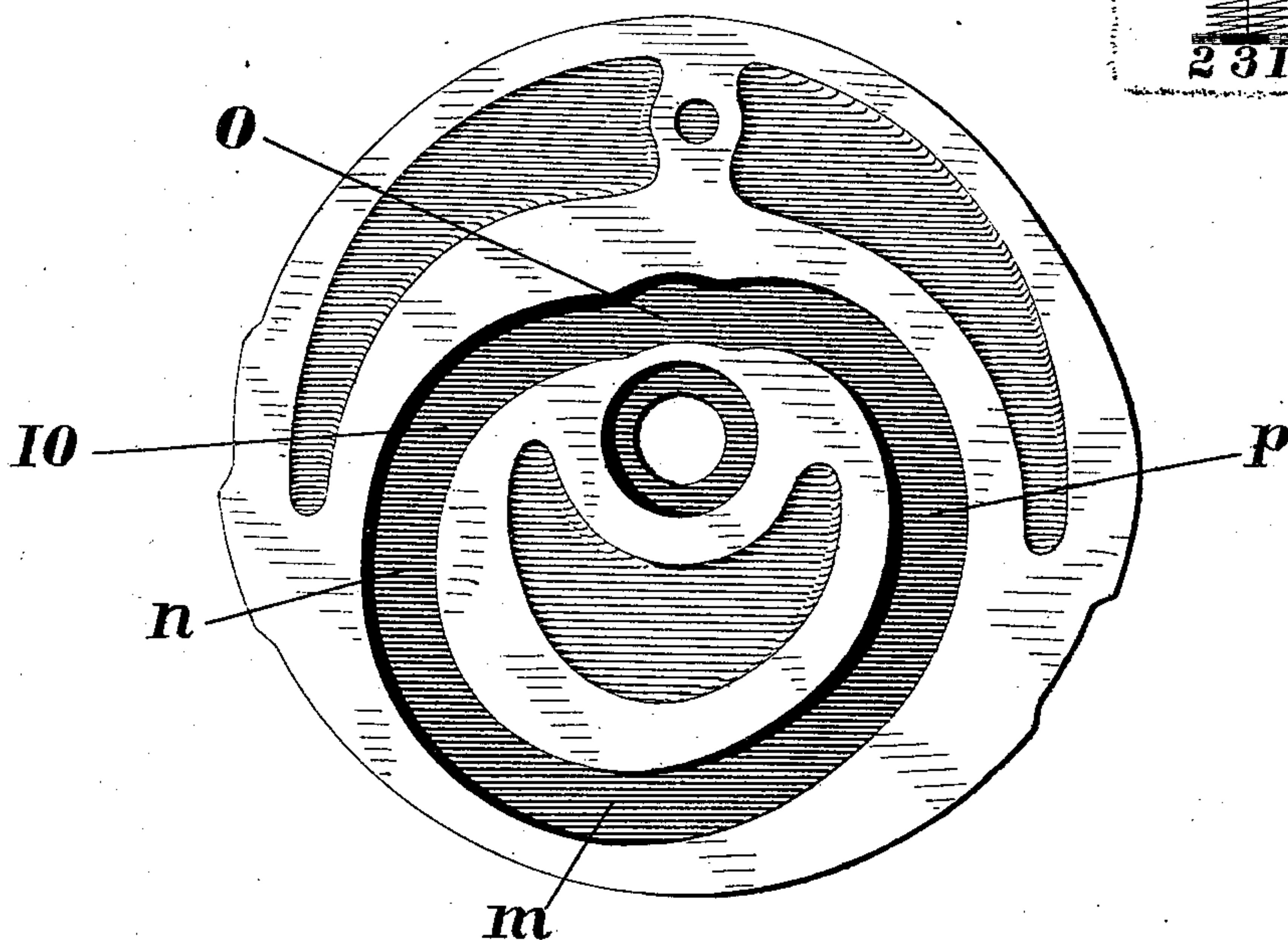


FIG. 4



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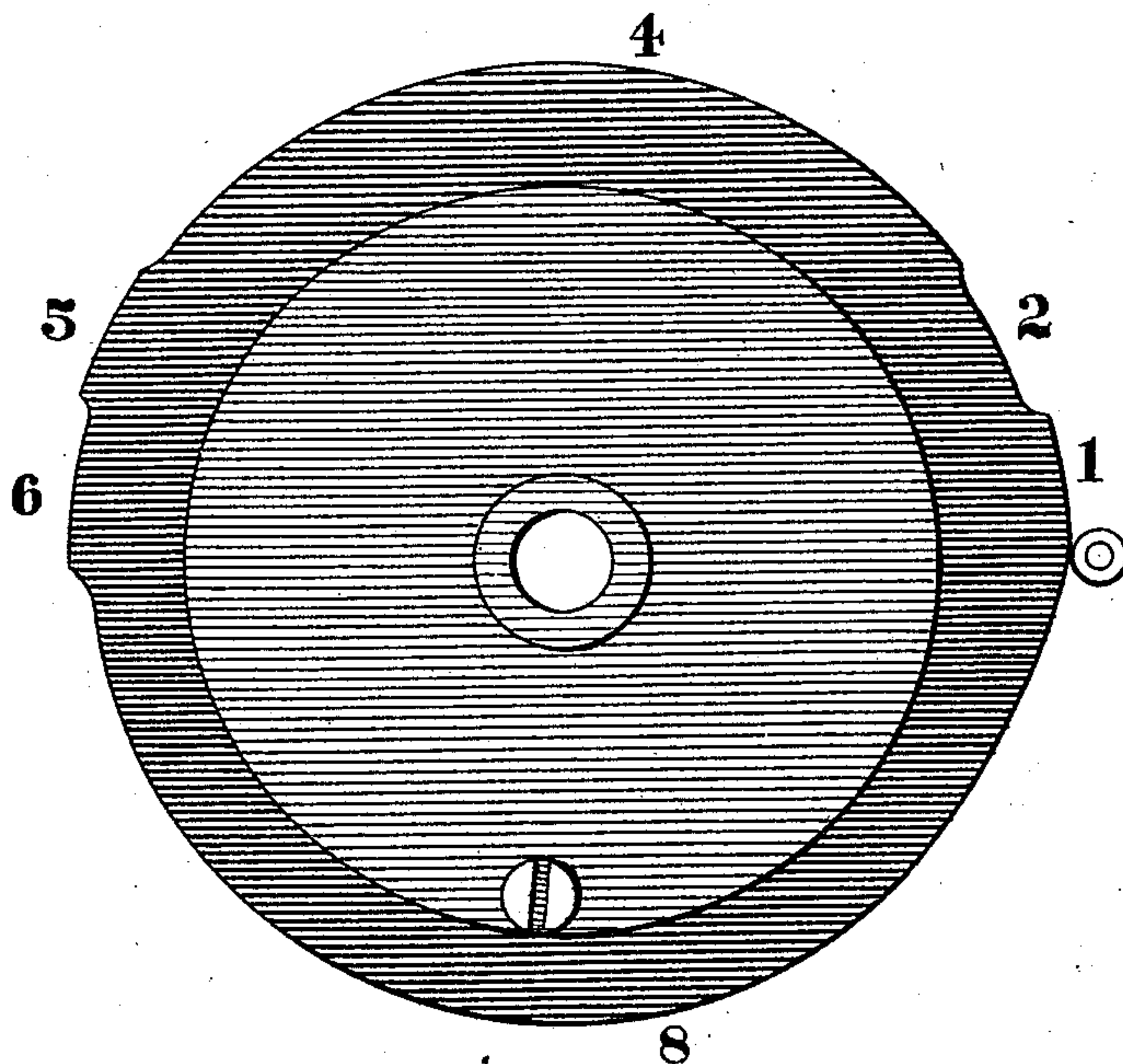
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(No Model.)

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FIG. 5



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UNITED STATES PATENT OFFICE.

ISAAC HOLDEN, OF BRIDGEPORT, CONNECTICUT.

BUTTONHOLE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 614,106, dated November 15, 1898.

Application filed June 4, 1897. Serial No. 639,441. (No model.)

To all whom it may concern:

Be it known that I, ISAAC HOLDEN, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Buttonhole-Sewing Machines, of which the following is a specification.

My invention relates to buttonhole-sewing machines of the well-known Wheeler & Wilson type.

In patent to A. C. Campbell, No. 303,557, granted August 12, 1884, mechanism is shown and described for actuating the cloth-clamp of a buttonhole-sewing machine.

The Wheeler & Wilson buttonhole-sewing machine embodies the principle or mode of operation of the Campbell invention referred to for actuating the cloth-clamp in connection with other improvements and with sewing mechanism employing but one needle to stitch both sides and to bar the ends of the buttonhole.

I have incorporated into the Wheeler & Wilson buttonhole-sewing machine an improved mechanism operating in connection with cloth-clamp-actuating mechanism of the Campbell type, in which I employ two needles to simultaneously overseam the two sides of a buttonhole and to bar each end of the buttonhole, one needle independent of the other, by a peculiar formation of barring-stitch, so as to obtain what is known as a "square-end" bar. By means of the peculiar bar which I give to the buttonhole by the employment of my improved mechanism the barring is greatly increased in strength at the point of the greatest wear or strain—namely, at the line of the buttonhole-slit. To these ends I have materially modified the cloth-clamp-actuating mechanism of the Wheeler & Wilson buttonhole-sewing machine, so as to coact with the two needles.

Having thus stated the principle of my invention, I will proceed now to describe the best mode in which I have contemplated applying that principle and then will particularly point out and distinctly claim the part, improvement, or combination which I claim as my invention.

Referring to the figures of the drawings, Figure 1 is a front side elevation of a Wheeler & Wilson automatic buttonhole-sewing ma-

chine embodying my invention. Fig. 2 is a plan view of Fig. 1 minus the arm of the machine and so much of the base to which the arm is attached. Fig. 3 is a plan view of the under side of the feed-cam embodied in the well-known Wheeler & Wilson automatic buttonhole-sewing machine. Fig. 4 is a similar view of the feed-cam as employed in my present invention. Fig. 5 is a top view of the cam shown in Fig. 4. Fig. 6 is a plan of a piece of material, showing the formation of the buttonhole overseaming and barring stitches made by a machine embodying my invention.

In the annexed drawings the cloth-clamp-actuating mechanism, which I designate generally by the reference-letter C, is common to the well-known Wheeler & Wilson automatic buttonhole-sewing machine and is shown and described in the Campbell patent above referred to, with the exception that herein I omit the space-screw B'', and with the further exception of changes in the cloth-clamp-actuating mechanism to be particularly pointed out hereinafter.

In the present instance there are some slight modifications in the clamp and pawl actuating mechanisms and in the switch-cam of the like parts shown and described in the Campbell patent; but these modifications are common to the Wheeler & Wilson buttonhole-sewing machine, and since they have nothing to do with my present invention I omit detailed description thereof.

In lieu of the single needle and single hook of the Wheeler & Wilson buttonhole-sewing machine I employ two vertical rotary hooks, two needles, one needle-bar, and needle-bar operating mechanism, together with complementary take-up mechanism common to the two-needle sewing-machine shown and described in United States Patent No. 578,136, granted March 2, 1897, to W. F. Dial and Geo. H. Dimond, assignors to the Wheeler & Wilson Manufacturing Company.

In the present instance I employ two needles which simultaneously bar one end of the buttonhole, after which they are employed to simultaneously stitch each one side of the buttonhole, and after the stitching simultaneously of both sides of the buttonhole, one by each needle, both needles are again employed

simultaneously to bar the other end of the buttonhole. For this purpose I give to the periphery of the feed-cam a peculiar conformation—namely, the periphery is divided up into portions varying with relation to the axis of the feed-cam, each portion serving its purpose in connection with the usual jog-roller, so that the barring and stitching will be formed in the order above indicated. The periphery of the feed-cam is divided into the following portions: 1 2 4 5 6 8. When the feed-cam and jog-roller are in the normal or starting position, (shown in Figs. 2 and 5,) the jog-roller is at the beginning of that portion of the periphery of the feed-cam designated by Fig. 1, and, coöperating with such portion, it will so hold the cloth-clamp with relation to the stitching mechanism, there being at such time the usual jog movement, but no lengthwise feed of the cloth-clamp, that the needles will operate in the following manner, namely: The needle A will bar the light portion 1 (see Fig. 6) while the needle B is barring a part of the dark portion 3, and they will so continue to bar so long as the portion 1 of the periphery of the feed-cam continues to pass by the jog-roller. Following this operation the depressed portion 2 of the periphery of the feed-cam will be brought opposite the jog-roller, whereupon the needles will operate to complete the barring at the first end of the buttonhole and in the following manner: The needle A will complete the barring of the black portion 3, (see Fig. 6,) while the needle-bar B will bar the light portion 2, and thus the bar at the first end of the buttonhole will have been completed as soon as the portion 2 of the periphery of the feed-cam shall have passed beyond the jog-roller. Next the portion 4 of the periphery of the feed-cam will be brought opposite the jog-roller, and thereupon the needles will stitch simultaneously, one for each side of the two sides of the buttonhole, it being of course understood that during such period of stitching the cloth-clamp-actuating mechanism will begin and continue the lengthwise feed of the cloth-clamp with relation to the needles in connection with the jog movement of said cloth-clamp, and the parts will continue to so operate until the portion 5 of the periphery of the feed-cam is brought opposite the jog-roller. At this stage the stitching of the sides of the buttonhole will have been completed, the lengthwise feed of the cloth-clamp will have been discontinued, and the buttonhole will have been brought into position with relation to the needles to begin the barring of the last end of the buttonhole. While the portion 5 of the periphery of the feed-cam continues opposite the jog-roller, the needle A will bar the portion 5 of Fig. 6 and the needle B will bar a part of the dark portion 7 of said figure. Upon continued rotation of the feed-cam the portion 6, succeeding portion 5, will be brought opposite the jog-roller, and thereupon the needle A (there being then no lengthwise

feed movement of the cloth-clamp-actuating mechanism) will complete the barring of the dark portion 7 and the needle B will bar the light portion 6, thus completing the bar at the last end of the buttonhole.

It will be observed that in the stitching and barring of the buttonhole (shown in Fig. 6) no portion of the periphery of the feed-cam designated by 8 will have passed by the jog-roller, and hence it will be observed that so much of the periphery of the feed-cam designated by 8 is not employed in the stitching and barring of the buttonhole. After a buttonhole is completed, therefore, the operator by means of the handle X (see Fig. 1) manually rotates the feed-cam to starting or normal position, (shown in Fig. 5,) when the machine is again in readiness to bar and stitch another buttonhole.

In Fig. 3 of the annexed drawings I have shown an under side plan view of the feed-cam of the well-known Wheeler & Wilson buttonhole-sewing machine, and in Fig. 4 I have shown a similar view of the same cam, but modified to better meet the requirements of my present invention. The modification of the periphery of the cam is also shown in Fig. 5 and has been fully described.

To refer now to the remaining modifications, the cam-groove 10 is constructed to coöperate with the peripheral surface as follows: Following in sequence the description of the peripheral portion of the cam, the portion *m* of the cam-groove 10 coöperates with the peripheral portions 1 and 2, the portion *n* with the peripheral portion 4, the portion *o* with the peripheral portions 5 and 6, and the portion *p* with the peripheral portion 8. The portion *p* of the cam-groove differs somewhat from the portion *n* of said cam-groove, the latter portion being constructed to give the proper step-by-step feed movement of the cloth-clamp while stitching the sides of the buttonhole. I make this change in the portion *p*, which coöperates with the peripheral portion 8, merely to get an easy run of the feed-cam when returned manually to starting position. This change is not essential, but merely desirable. In fact a heart cam-groove, such as is illustrated by 11, Fig. 3, could be employed in connection with my invention, provided the heel and point 12 13, respectively, were deadened substantially as shown at *o* and *m* in Fig. 4, so as to coöperate, respectively, with the portions 1 and 2 and the portions 5 and 6. When so constructed, the feed-cam could be automatically returned to starting position by the continued operation of the machine, in which instance the needles would travel back over the overseam-stitches laid along the sides of the buttonhole and overcast said overseam-stitches with a second line of overseam-stitches, whereby the buttonhole would be overseamed by a double line of overseam-stitches.

Referring to Fig. 2, C D are two vertical

hooks constructed and operating substantially as shown and described in the patent to Dial and Dimond, above referred to, and which are respectively operated on the main shaft E through the gears *e e'*, the auxiliary shaft F in the hangers *f*, and the beveled gears *f² f³*. I claim herein no novelty in the vertical hooks and their operating mechanism *per se*, and hence I deem it unnecessary to give further description thereof.

What I claim is—

In a buttonhole-sewing machine, stitch-forming mechanism including two needles, two upper threads, two looper mechanisms, two lower threads to cooperate with the needles and their threads; a cloth-clamp, a mechanism, including a cloth-clamp feed-cam and a cooperating design-cam, for producing

a relative feeding and jogging movement between said cloth-clamp and stitch-forming mechanism whereby the two sides of the buttonhole are sewed, and mechanism for changing the relative jogging movement, whereby the ends of the buttonhole are barred by stitches laid crosswise of the buttonhole-slit, and which overlap the line of said slit, all by one continuous automatic operation, in combination, substantially as described.

In testimony whereof I have signed this specification, in the presence of two subscribing witnesses, this 31st day of May, 1897.

ISAAC HOLDEN.

Witnesses:

F. W. OSTROW,
GEO. CORNWELL.