

(No Model.)

4 Sheets—Sheet 1.

J. E. BERTRAND.
SOLE SEWING MACHINE.

No. 502,873.

Patented Aug. 8, 1893.

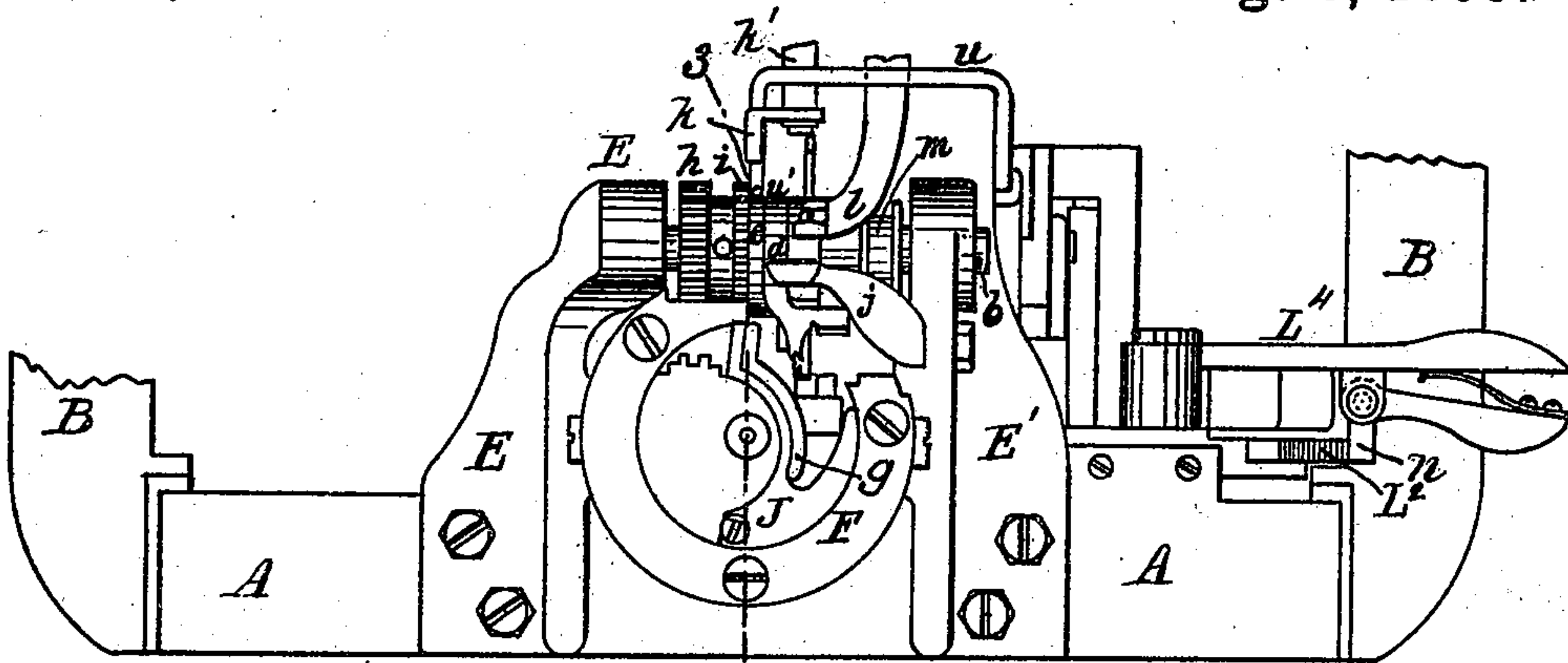
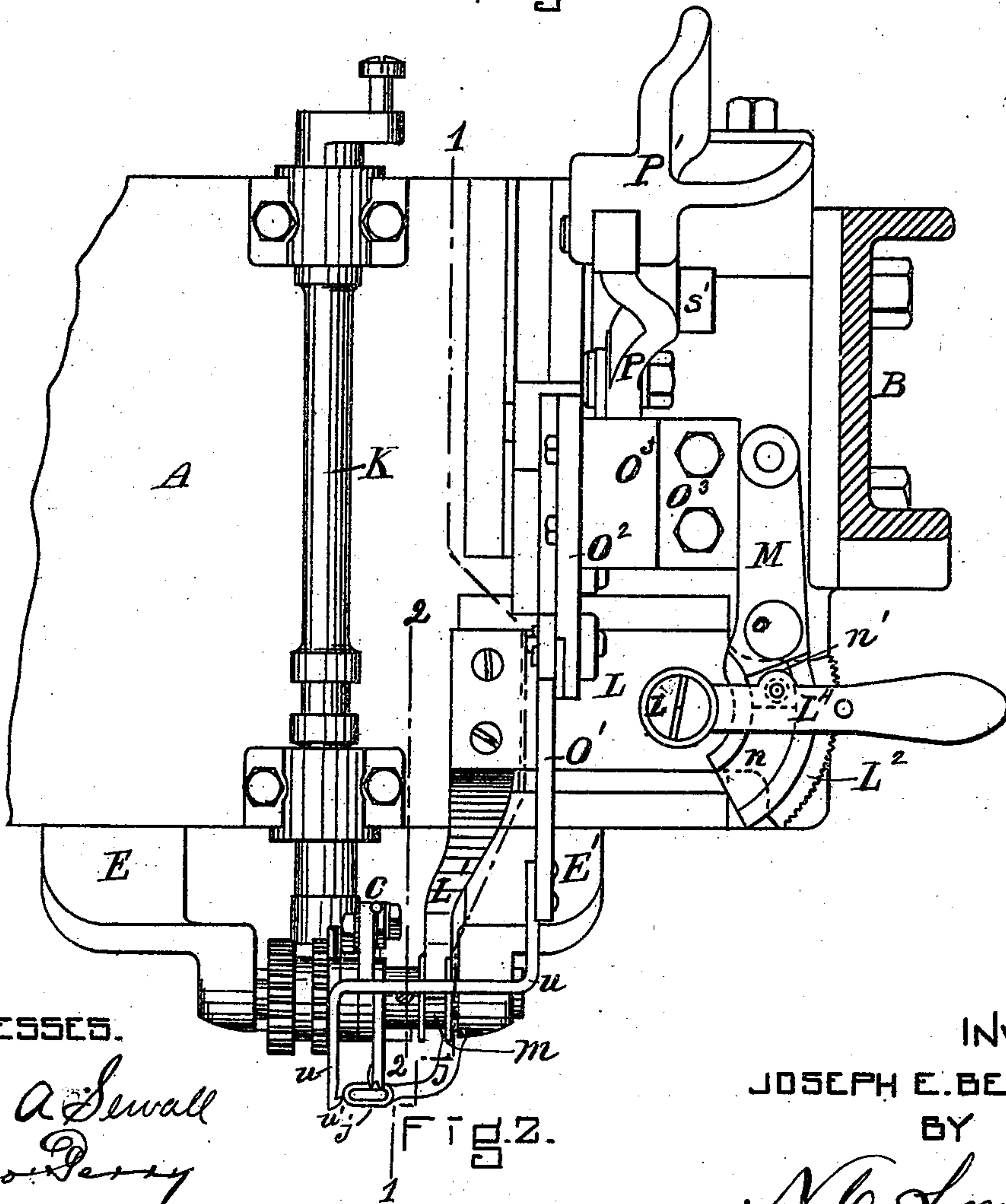


Fig. 1.



WITNESSES.

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Fig. 2.

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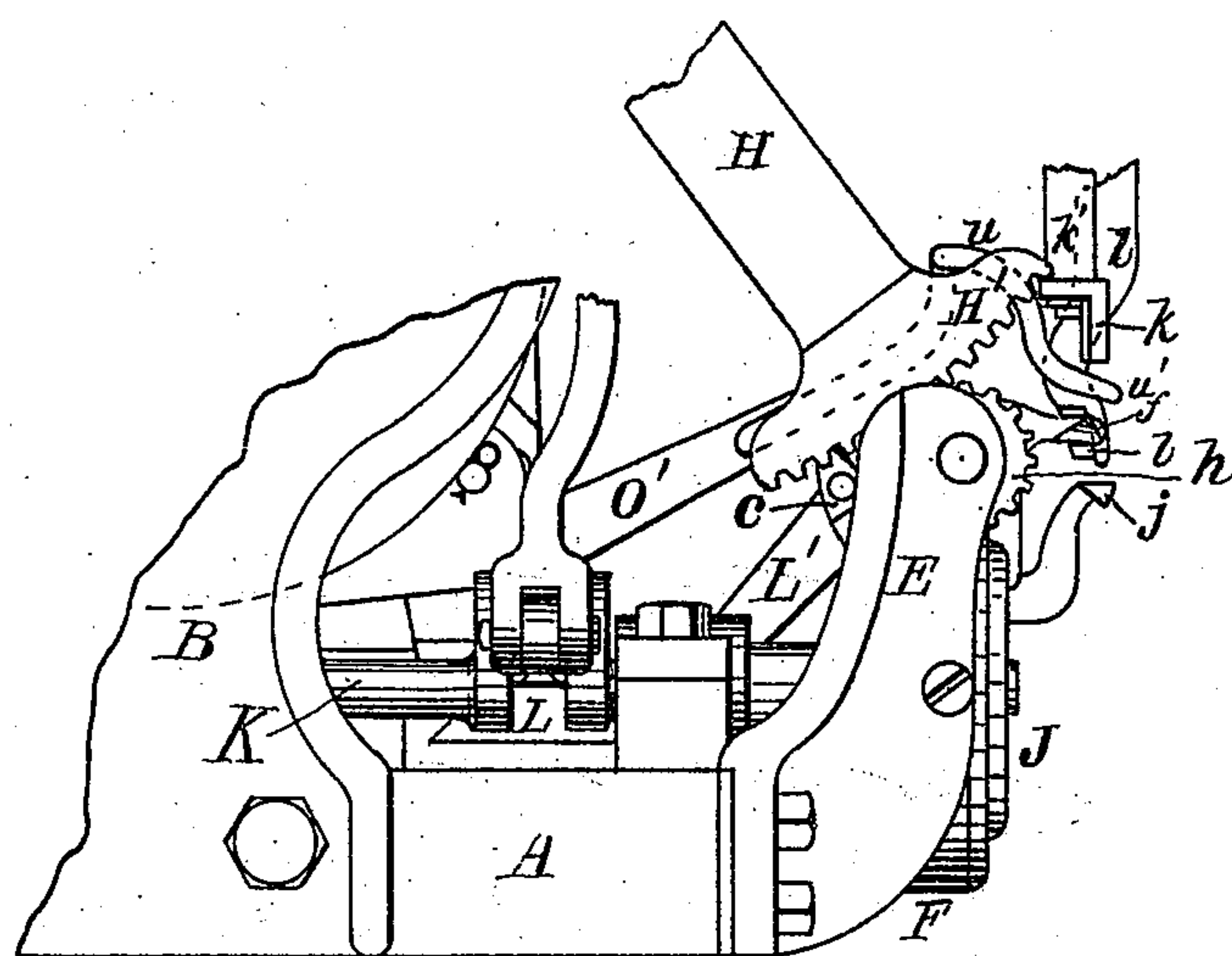


Fig. 3.

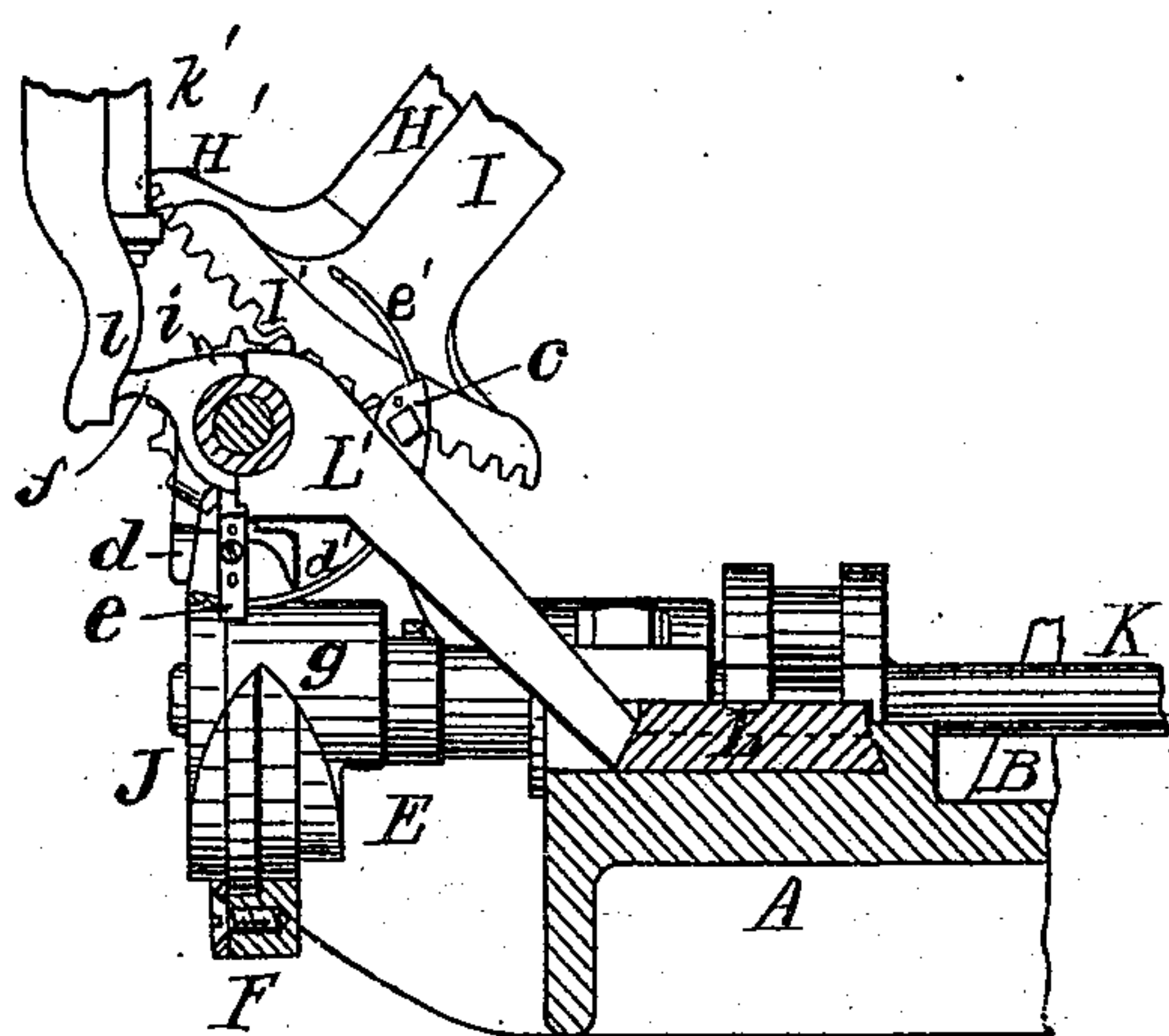


Fig. 4.

WITNESSES.

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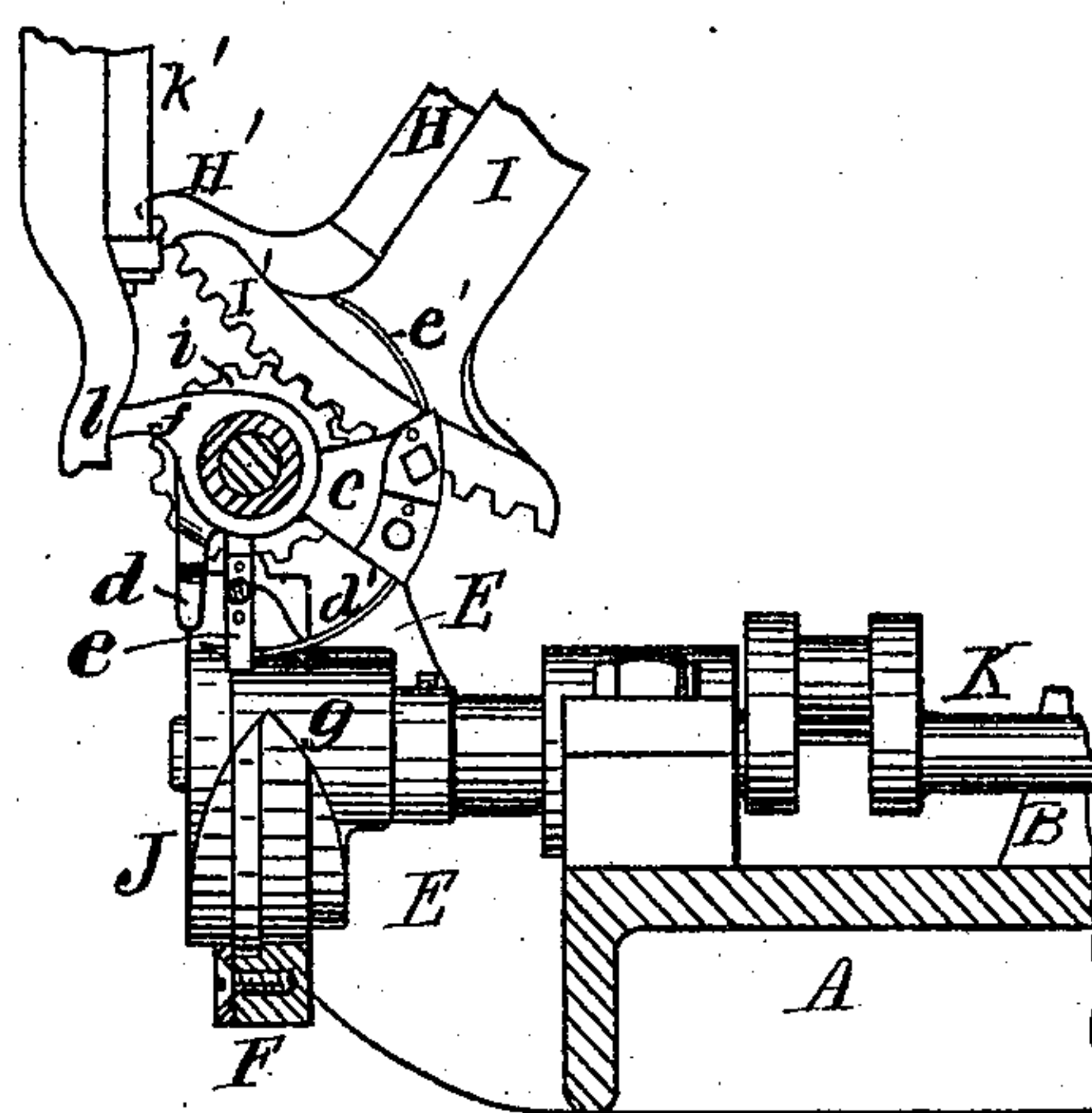


Fig. 5.

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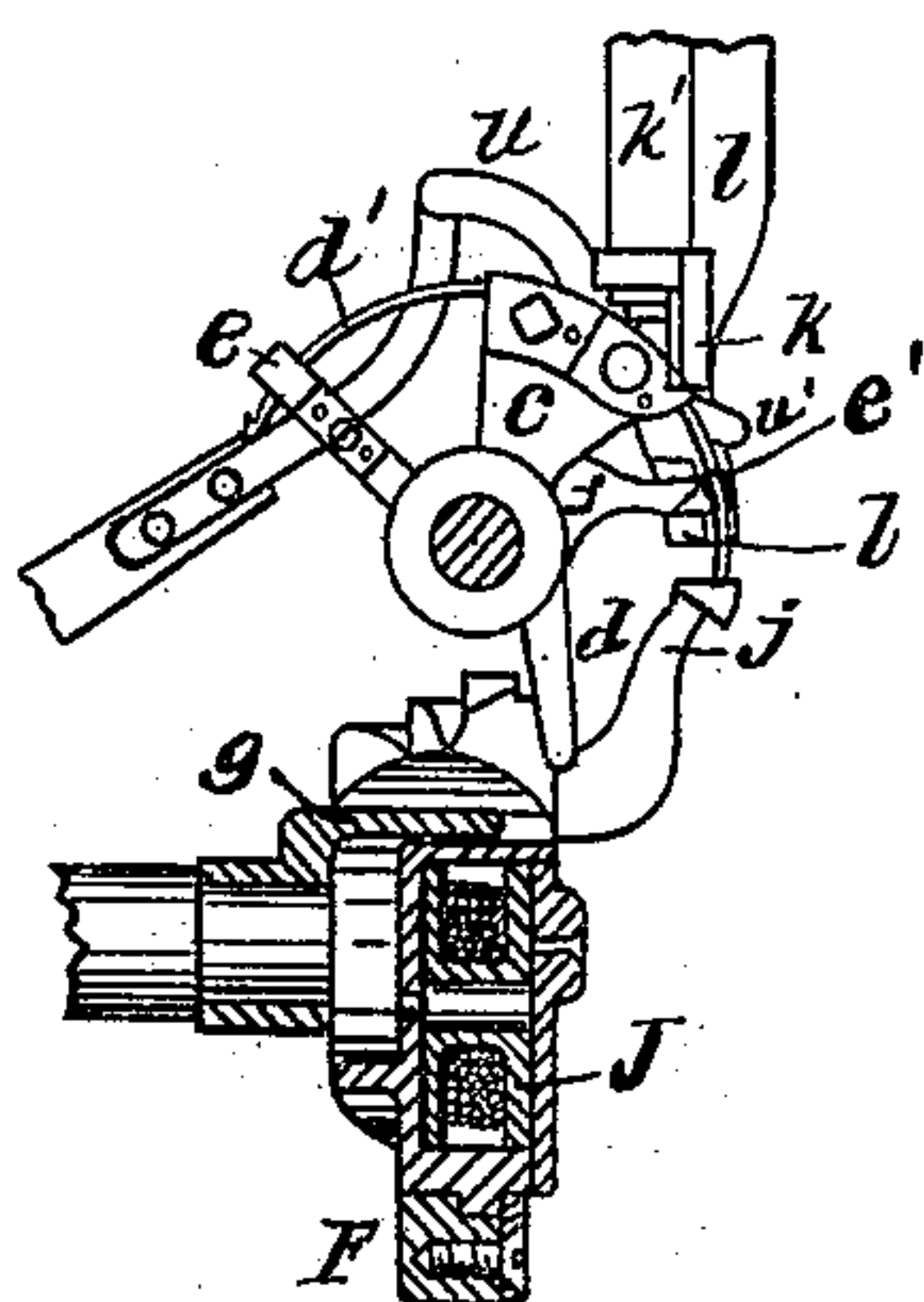


Fig. 6.

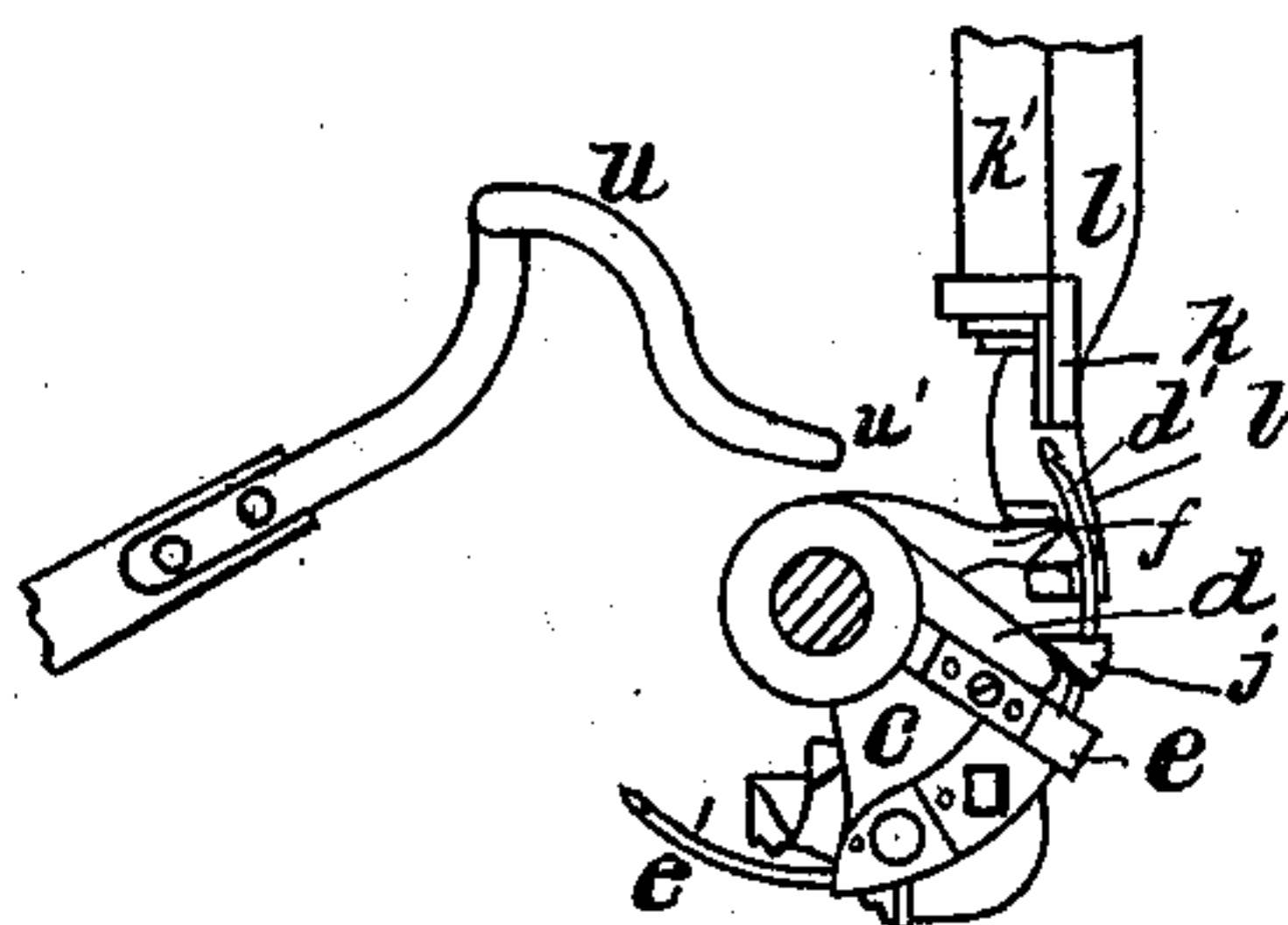


Fig-7-

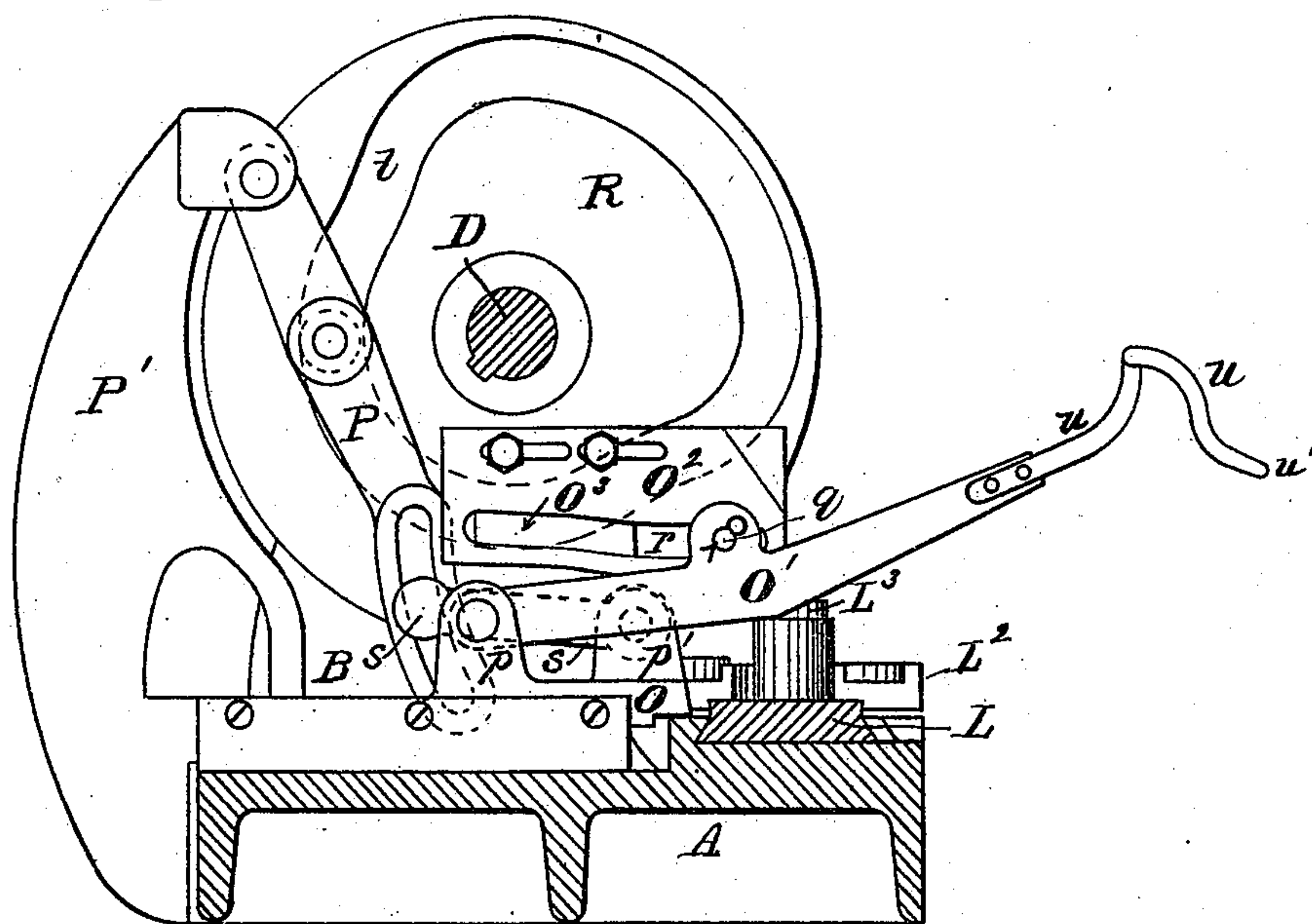


Fig-B.

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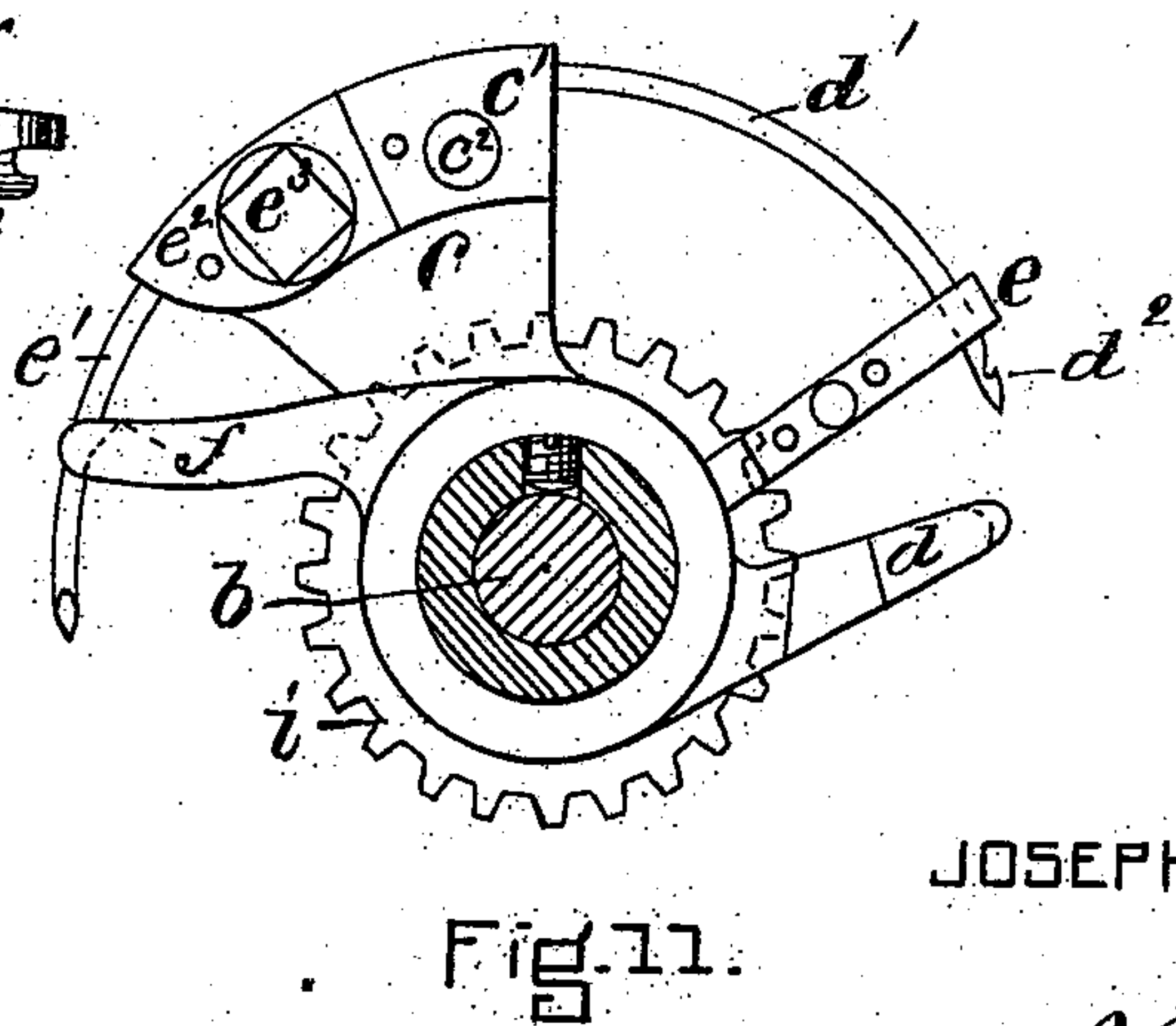
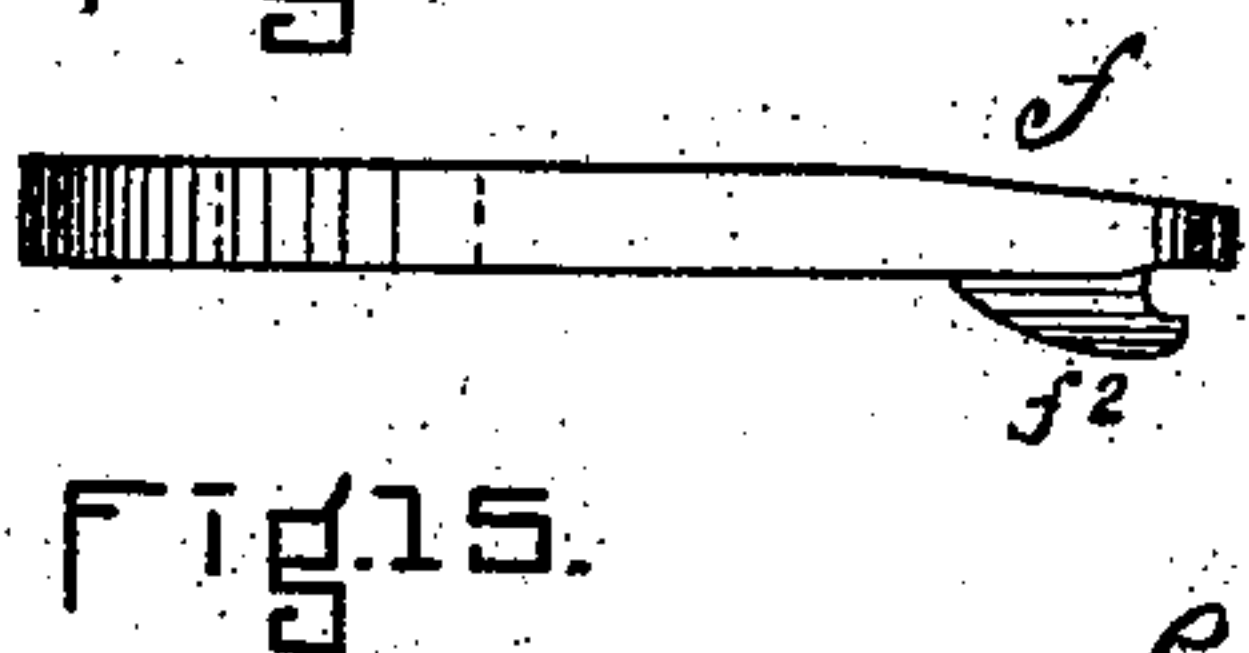
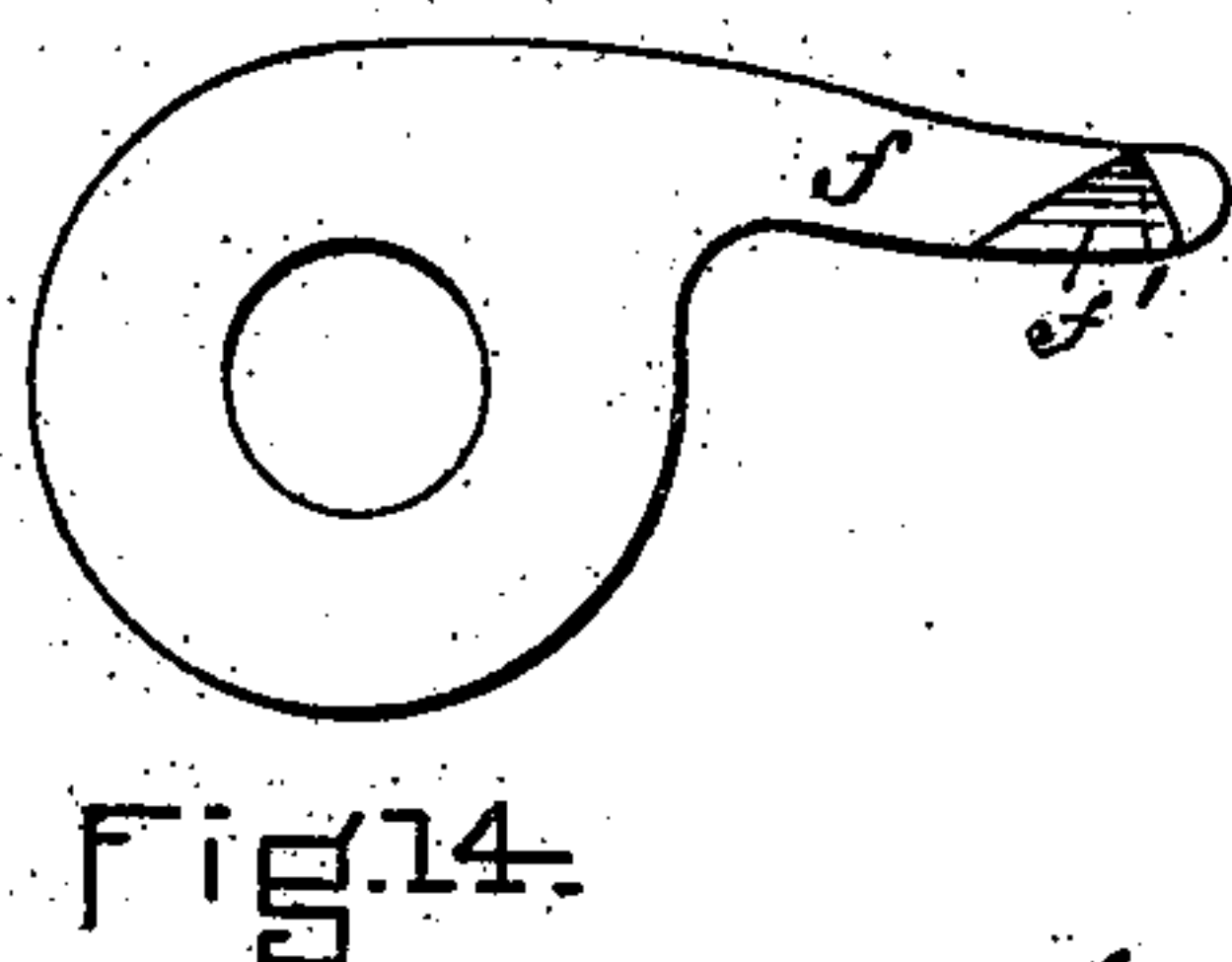
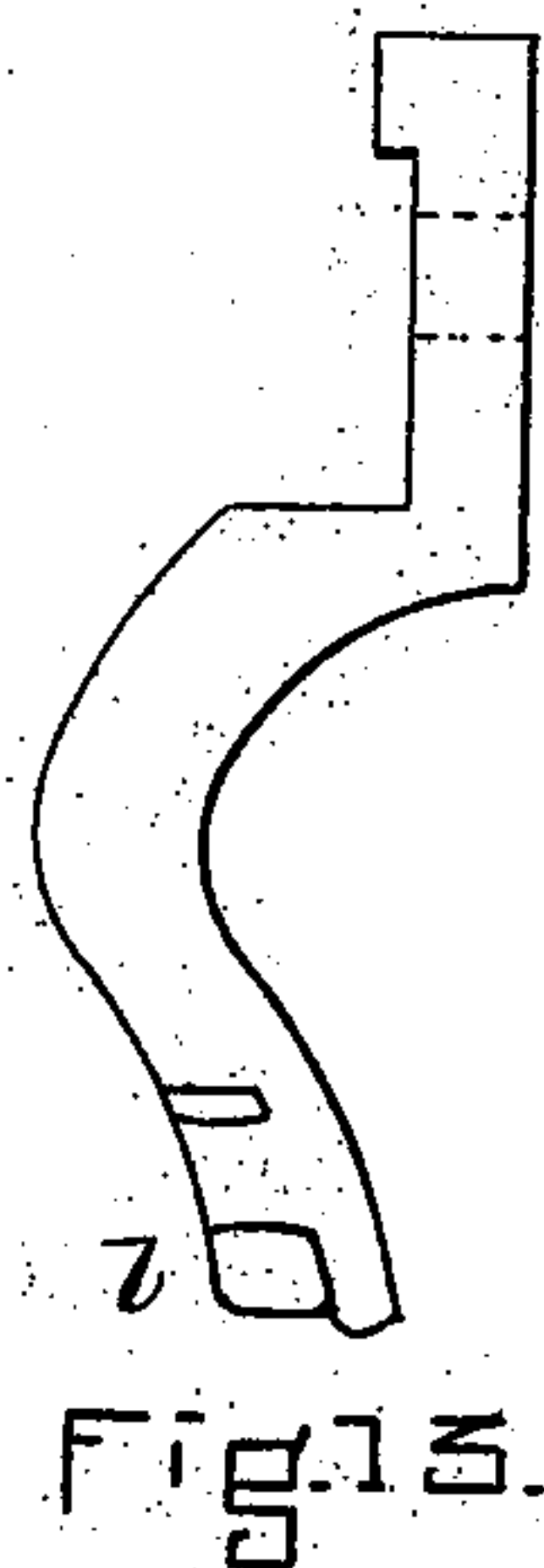
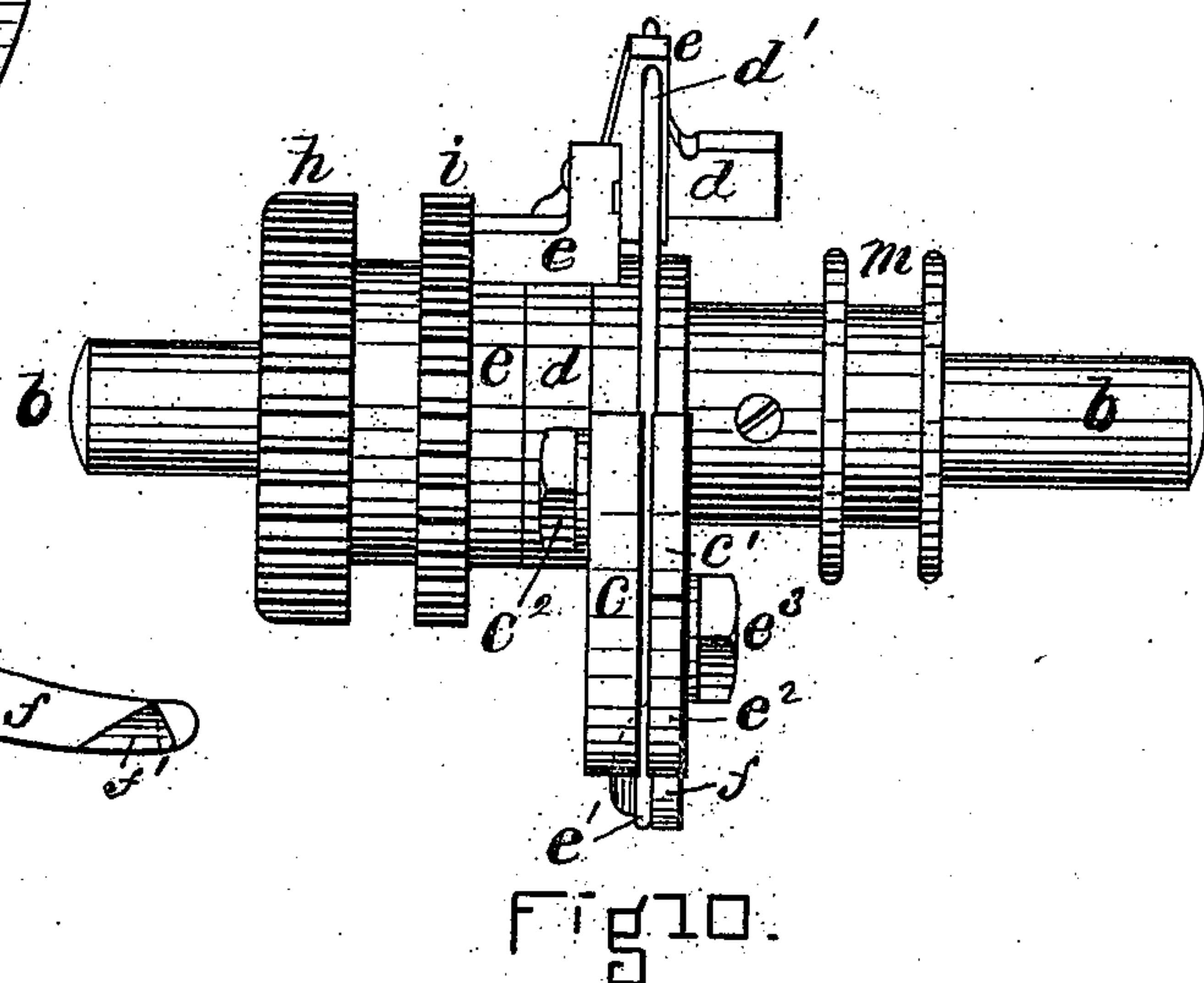
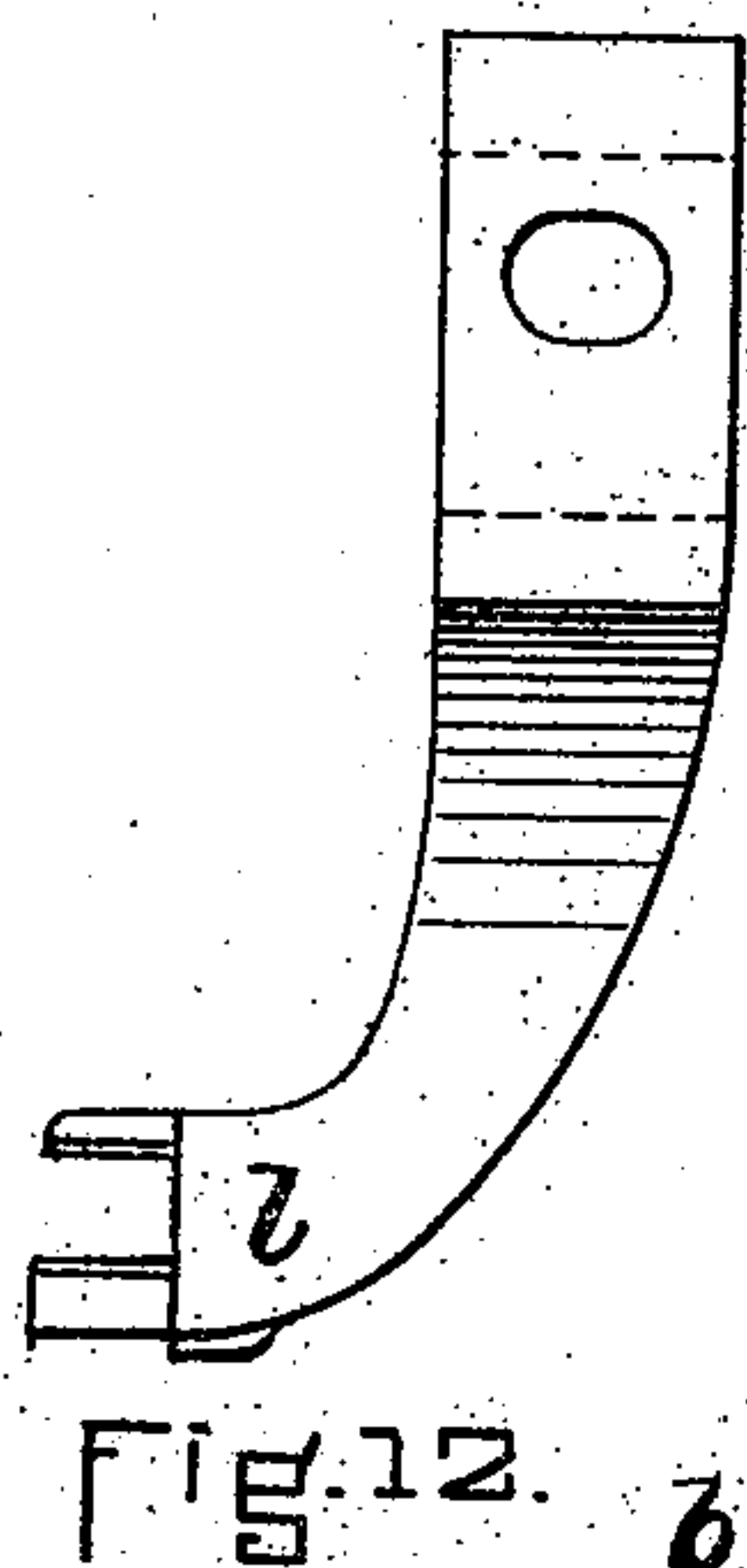
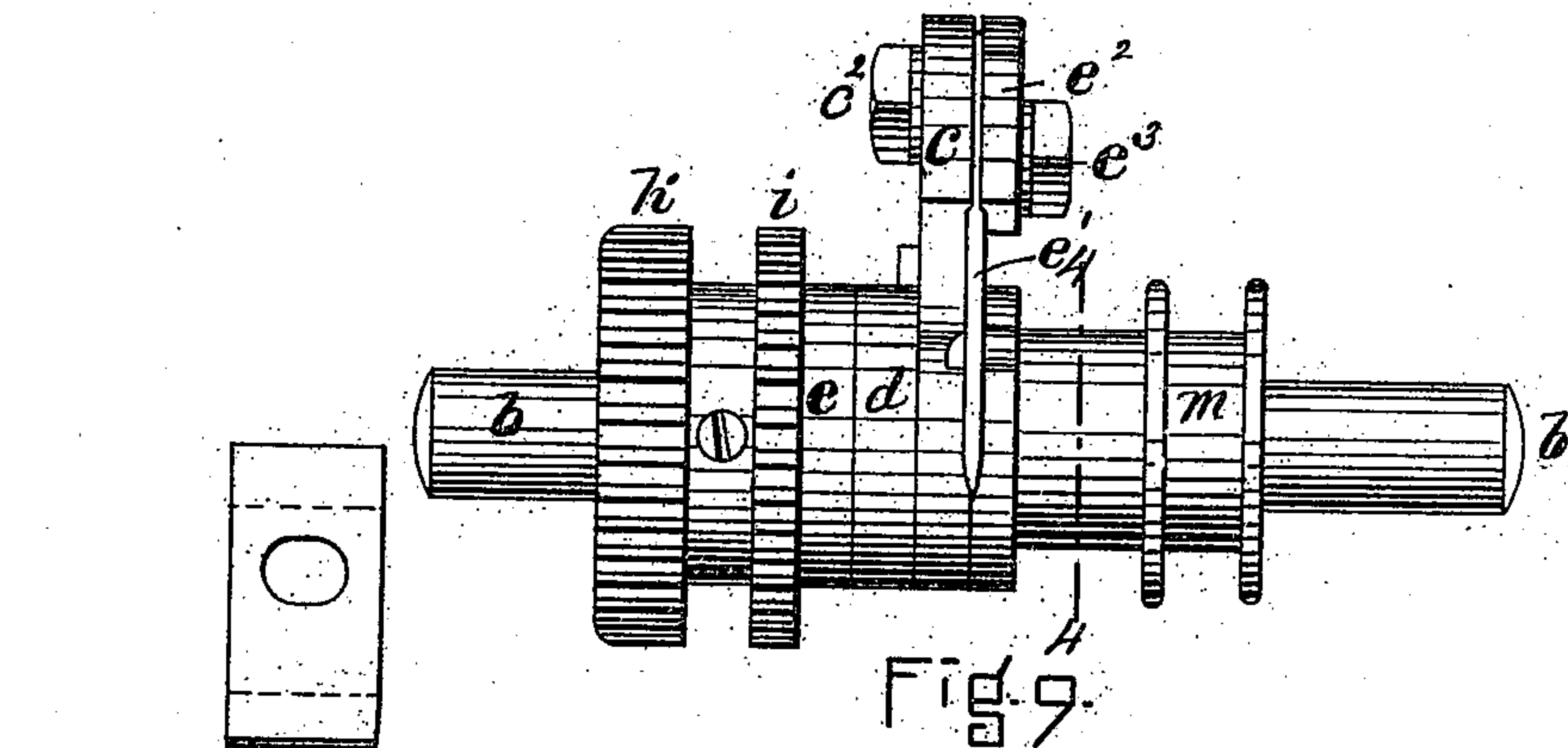
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George Perry

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UNITED STATES PATENT OFFICE.

JOSEPH ELI BERTRAND, OF BOSTON, ASSIGNOR OF ONE-HALF TO MELLEN BRAY, OF NEWTON, MASSACHUSETTS.

SOLE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 502,873, dated August 8, 1893.

Application filed September 17, 1892. Serial No. 446,208. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Sole-Sewing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to sole sewing machines and it consists in certain novel features of construction, arrangement and combination of parts which will be readily understood by reference to the description of the drawings and to the claims contained herein and in which my invention is clearly pointed out.

Figure 1 of the drawings is a front elevation of so much of the head of a sole sewing machine as is necessary to illustrate my invention, reference being had to the Letters-Patent, No. 432,011, granted to me July 15, 1890, and to another application of mine of even date herewith for information relative to the parts of the machine not illustrated in the drawings of this application. Fig. 2 is a partial sectional plan showing the same parts. Fig. 3 is a partial end elevation of the machine and showing the same parts. Fig. 4 is a vertical section on line 1, 1, on Fig. 2, looking toward the left of said figure. Fig. 5, is a similar section on line 2, 2, on Fig. 2 looking toward the left of said figure. Fig. 6 is a vertical section through the shuttle, its race and carrier and the needle and awl carrying shaft, on line 3, 3, on Fig. 1 and showing the needle and awl and their carrying arm, the needle guides or supports and the loop spreader in elevation, in the positions they assume when the needle is at the extreme of its rearward movement and the awl is in the work. Fig. 7 is a similar view showing the needle and awl at the other extreme of their movement with the needle in the work. Fig. 8, is a section of a portion of the machine on line 1, 1, on Fig. 2 looking toward the right of said figure. Fig. 9, is a front elevation of the needle and awl carrying arm, its supporting shaft, the needle guides or supports, the loop spreader and the pinions by which said parts are oscillated about their axis of motion as seen when removed from the machine. Fig. 10 is a plan of the same parts. Fig. 11 is a

sectional elevation of the same parts, the cutting plane being on line 4, 4, on Fig. 9, and looking toward the left of said figure. Fig. 12 is a front elevation of the presser foot removed from the machine. Fig. 13 is a side elevation of the same looking toward the right of Fig. 1. Fig. 14 is a side elevation of the upper needle guide or stay, and Fig. 15 is a plan of the same.

In the drawings A is the bed or base plate of the head of the machine.

B B represent portions of the end frames. D is the cam shaft.

E and E' are the stands which support the shuttle-race F and in bearings in which is mounted the shaft *b* having formed thereon or secured thereto the awl and needle carrying radius arm *c*, and having loosely mounted thereon the loop spreader *d*, the needle guide *e* and the needle stay or support *f*. The shaft *b* has firmly secured thereon the pinion *h* which is acted upon to oscillate said shaft *b* by the segment H' on the lever H to which an oscillating motion is imparted by a cam in the same manner as shown and described in the Letters Patent No. 432,011, dated July 15, 1890, and in another application of mine of even date herewith, Serial No. 446,207 to which reference may be had for information regarding all parts of the machine not clearly shown and described in this application. The needle guide *e* has an intermittent oscillating motion imparted thereto by the gear segment I' on the end of the lever I engaging with the pinion *i* on the hub of said needle guide and a suitable cam acting upon said lever to vibrate it as in my before cited prior patent.

To the stand E' is firmly secured the work support *j*.

k is the thread carrier; *k'* its shaft.

l is the presser foot carried by a presser-bar (not shown), and operated as in my prior patent and pending application before cited.

The radius arm *c* has clamped thereto by the plate *c'* and clamping screw *c²* the needle *d'* curved to an arc of a circle concentric to the axis of the shaft *b* and provided near its point with the barb *d²*.

In my prior patent before cited the awl and needle were arranged side by side and carried by separate radius arms or segments which were adjustable toward and from each

other and both entered the work from the same side, and in my pending application the awl and needle are shown and described as mounted in separate radius arms adjustable toward and from each other but so arranged relative to each other that they enter the work from opposite sides and at different times. In my present invention the awl e' is secured to the same radius arm c that carries the needle d' and in the same vertical plane therewith by the plate e^2 and clamping screw e^3 with its piercing end pointing in the opposite direction to that of the needle but distant from the piercing end of said needle, in the direction which the needle points, of somewhat more than one hundred and eighty degrees. By this arrangement of the awl and needle relative to each other I am enabled to impart to said needle and awl a sufficient length of stroke so that the needle will draw out the loop below the work to its full extent without the employment of any special or separate device therefor as shown in Fig. 11.

The needle guide e has formed in its outer end a hole for the passage of the needle and serves to stay or support the needle when it is being forced through the work and prevent it being thrown out of its proper position. It has been found however that with no other stay or support for the needle when feeding the work the needle is liable to be sprung to one side to the injury of the needle and also of the work performed. To obviate this defect I mount upon the shaft b the needle stay arm f the outer end of which has formed therein the slot or groove f' in which the needle lies when the work is being fed, the said outer end of said stay arm being connected to and movable with the presser foot l when said foot is moved up or down, and at the same time is movable laterally with the needle and the shaft b for the purpose of feeding the work when the needle is in the position shown in Fig. 7. The connection of the stay f to the presser foot l may be accomplished in any convenient manner, but I prefer to slot the presser foot as shown in Figs. 12 and 13, and insert the outer end of the stay arm within said slot as shown in Figs. 1, 3, 6, and 7. By this construction and arrangement of the parts the needle is firmly supported below the work by the needle guide e and above the work by the stay arm f , when the work is being fed so that it is impossible for the needle to be sprung out of shape or position by the strain of feeding the work.

The shuttle J is mounted in the race F and has an intermittent rotary motion always in the same direction imparted thereto by the crank shaft K the shuttle carrier g , a pair of cams, a pair of levers and a pair of connecting rods precisely as shown and described in my before cited application.

The bed A has formed on its upper surface, at its right hand front corner a dovetailed groove the sides of which are parallel with

the front edge of said bed, in which is fitted, so as to be movable endwise therein the plate L , which has formed thereon or secured thereto the shipper arm L' the front end of which is forked or grooved and engages with the annular groove of the collar m firmly secured upon the shaft b , as a means of moving said shaft and the needle and awl carrying radius arm in the direction of the length of said shaft in the same manner as shown and described in my before cited prior patent.

The right hand end of the plate L has formed thereon or secured thereto the segmental ratchet L^2 the curve of which is concentric with the center of the stud L^3 set in said plate L and upon which is mounted the hand-lever L^4 the handle end of which is provided with the spring actuated dog or pawl n which engages the teeth of the segment L^2 to lock said hand-lever in the position to which it is adjusted. The hand-lever L^4 has set in its under side a stud upon which is mounted a segmental block n' which fits into the curved slot n^2 formed in the upper side of the front arm of the lever M fulcrumed at o and carrying at its rear end a roll which is acted upon by a cylinder cam to vibrate said lever all as shown and described in my before cited Letters Patent.

The bed A has formed in its upper surface another dovetailed groove at right angles to the front edge of said bed on which is mounted, so as to be movable endwise therein, the bar or plate O provided with two upwardly projecting ears p and p' to the former of which is pivoted the lever O' carrying at or near the middle of its length a roll or stud q which fits into and reciprocates in the cam slot r formed in the plate O^2 adjustably secured to the stand O^3 as shown in Fig. 8. The ear p' has pivoted thereto one end of the link s the opposite end of which is adjustably pivoted to the slotted lower arm of the lever P which is pivoted at its upper end to the stand P' and carries between its two ends a roll or stud s' (shown in Fig. 2 and in dotted lines in Fig. 8,) which fits into and is acted upon by the cam path t of the cam disk R to impart to said plate O and lever O' a reciprocating motion toward and from the front of the machine during which reciprocation the front end of said lever O' has imparted thereto, by the action of the cam-slot r upon the stud or roll q , a short rise and fall, all as shown and described in my before cited prior patent.

To the front end of the lever O' is secured the rear end of the looper-finger u which has formed on its front end the thread engaging hook u' and is bent upward and downward as shown in Figs. 3, 6, 7 and 8 and laterally as shown in Figs. 1 and 2 so as to permit a free oscillation of the needle and awl carrier without conflict therewith. Otherwise the looper-finger u is constructed and operated in the same manner as in my prior patent and pending application before cited.

The arm *f* serves the double purpose of a support or stay for the needle upon the side of the work opposite to that at which the needle enters the work to prevent the needle being sprung or thrown out of its proper position when the work is being fed, and to prevent the loop of thread, when discharged from the hook of the looper-finger and being drawn through the work by the rearward movement of the needle from falling upon the work in such a position as to be cut by the awl when it pierces the material. This latter function is performed by the curved and rounded projection *f*² which spreads the loop and keeps the two parts separate until the thread is nearly drawn tight and the awl has pierced the work. By the action of the curved and rounded projection *f*² upon the left hand strand of the loop of thread pressing it away from the right hand strand toward the left as said loop is being drawn downward it is impossible for said loop of thread to lie in a position to be cut by the awl as it enters the work.

The principal movements of the machine when in operation are substantially the same as in my prior patent or pending application hereinbefore cited and hence they are not fully illustrated in the drawings or described herein.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a sewing machine the combination with a needle constructed and arranged to enter the work and then be moved laterally to feed the work, and mechanism for moving said needle laterally, of a needle guide on the side of the work that the needle enters the same, and a needle stay or support upon the opposite side of the work said guide and stay both being movable laterally with said needle.

2. In a sewing machine the combination with a work support and a presser-foot, of a needle constructed and arranged to enter the work from the side that rests upon the work support and a needle stay or supporting arm upon the opposite side of the work and con-

structed and arranged to be moved laterally with said needle to feed the work.

3. The combination of a work support a needle constructed and arranged to enter the work at the side thereof that rests upon said work support; a presser foot constructed and arranged to press upon the side of the work opposite to said work support; a needle stay or support upon the same side of the work as, and connected to, the presser-foot so as to be movable therewith when said presser foot is raised or depressed and adapted to be moved laterally independently of said presser foot, and means having provision for moving said needle and needle stay laterally to feed the work.

4. The combination in a sewing machine of a needle and awl operating shaft mounted in bearings so as to be revoluble and movable endwise therein; a single radius arm or segment formed in one piece with or firmly secured to said shaft so as to be revoluble and movable endwise therewith; a curved needle mounted in and projecting from one side of said arm or segment; a curved awl mounted in and projecting from the opposite side of said arm or segment; a grooved collar fixed on said shaft, a loop spreader and two needle guides or supports mounted on said shaft and movable about its axis said needle guides or supports being arranged upon opposite sides of the work; a shipper arm engaging said grooved collar; means having provision for reciprocating said shipper arm to move said shaft endwise; and mechanism for oscillating said shaft to cause the needle and awl to alternately pierce the work.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 14th day of September, A. D. 1892.

JOSEPH ELI BERTRAND.

Witnesses:

N. C. LOMBARD,
JAMES T. MURRAY.