

(No Model.)

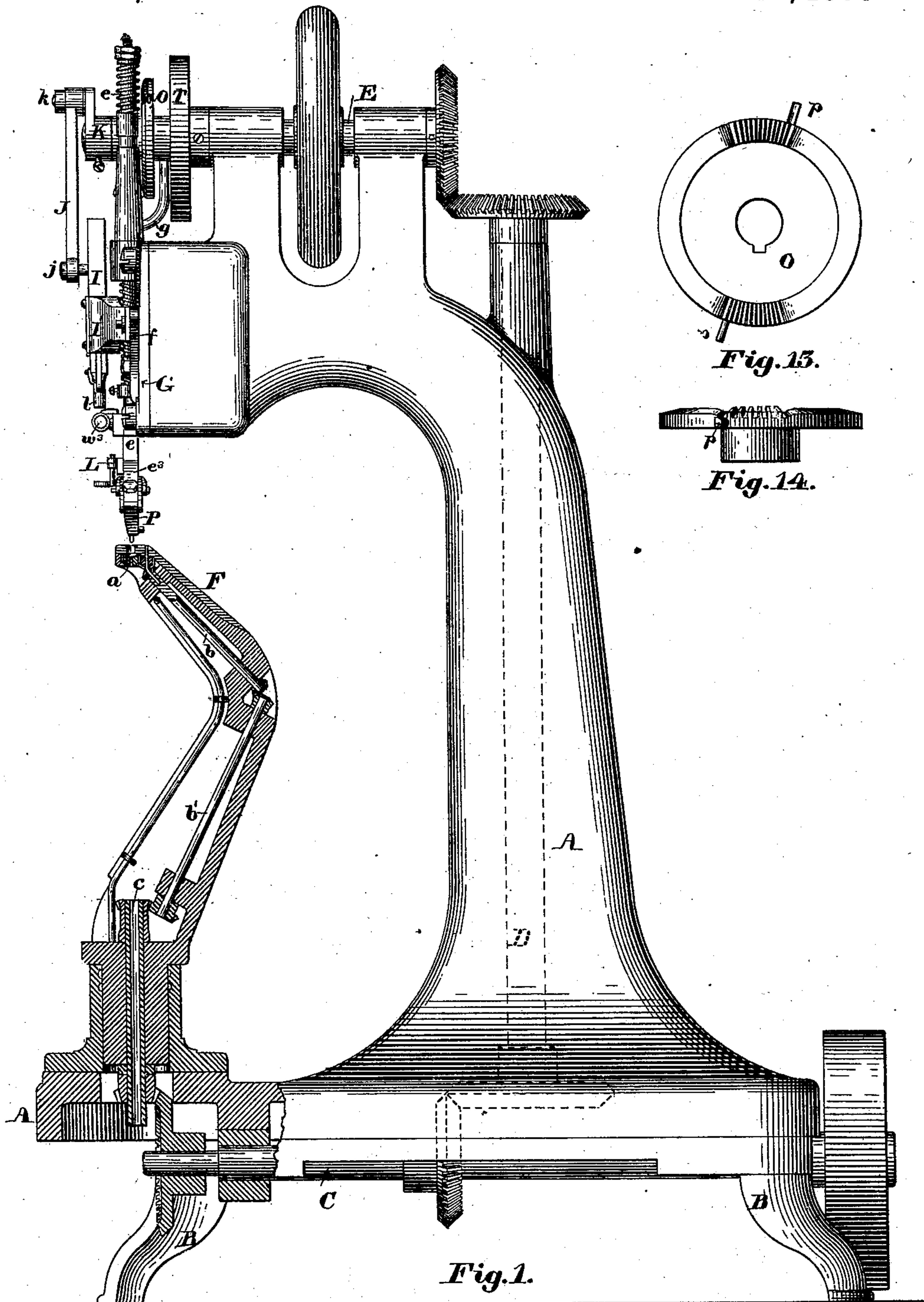
2 Sheets—Sheet 1.

C. BROWN.

BOOT AND SHOE SEWING MACHINE.

No. 272,409.

Patented Feb. 20, 1883.



Witnesses:

Walter E. Lombard.  
C. A. Hemmenway.

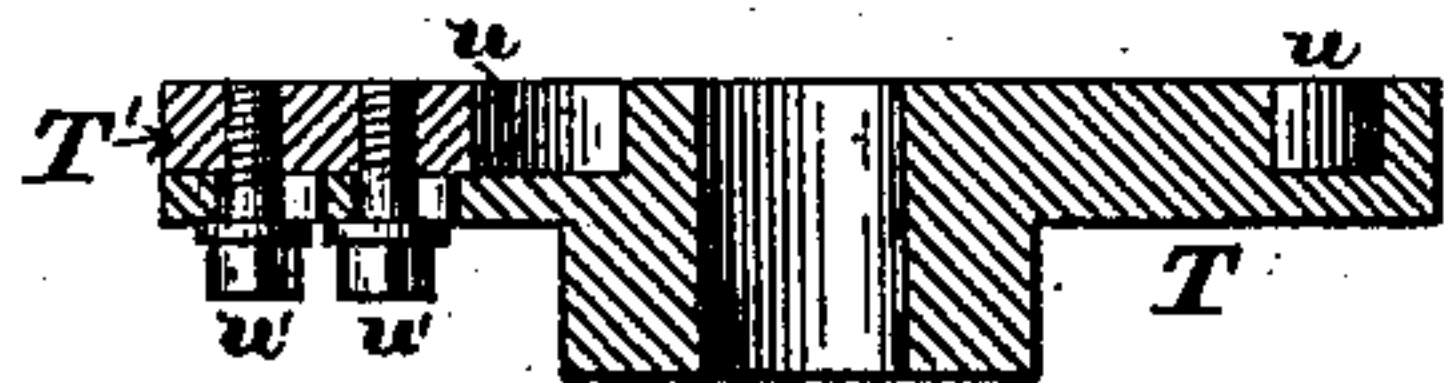
Inventor:

Charles Brown  
by N. E. Lombard,  
Attorney.

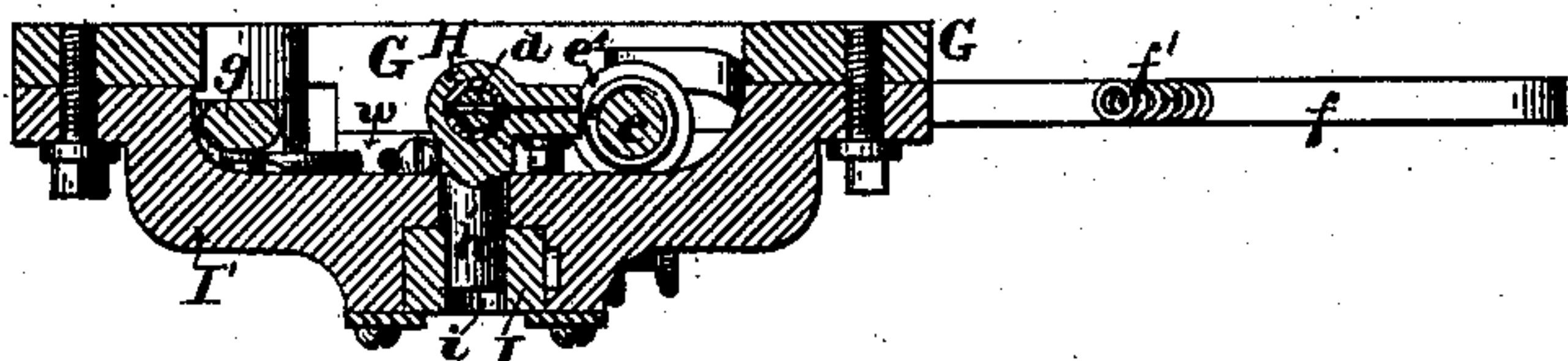
2 Sheets—Sheet 2.

## BOOT AND SHOE SEWING MACHINE.

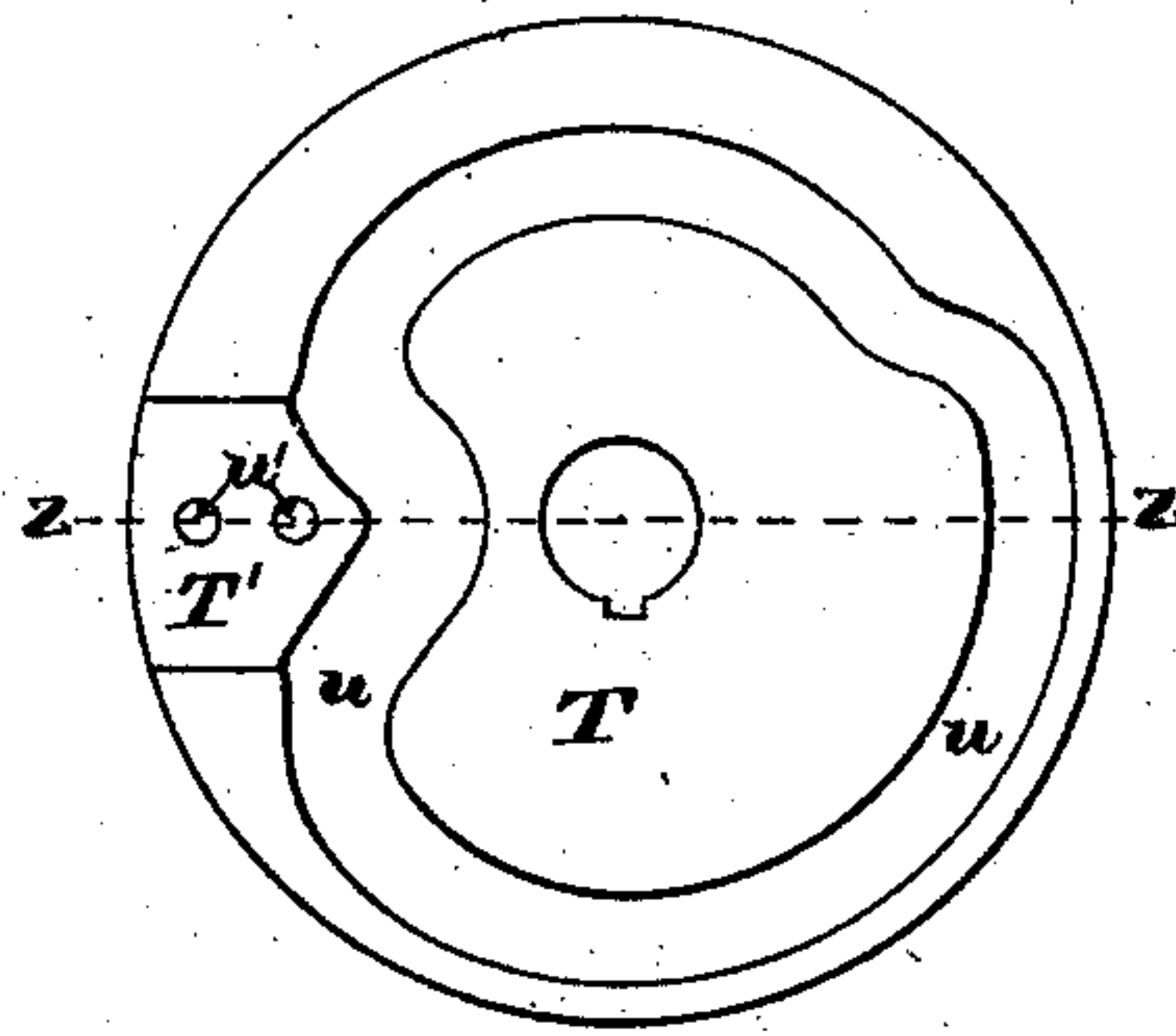
Patented Feb. 20, 1883.



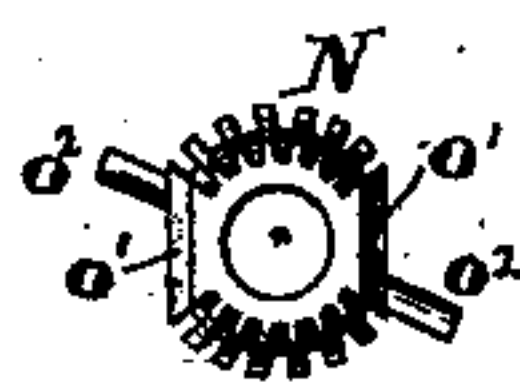
**Fig:6**



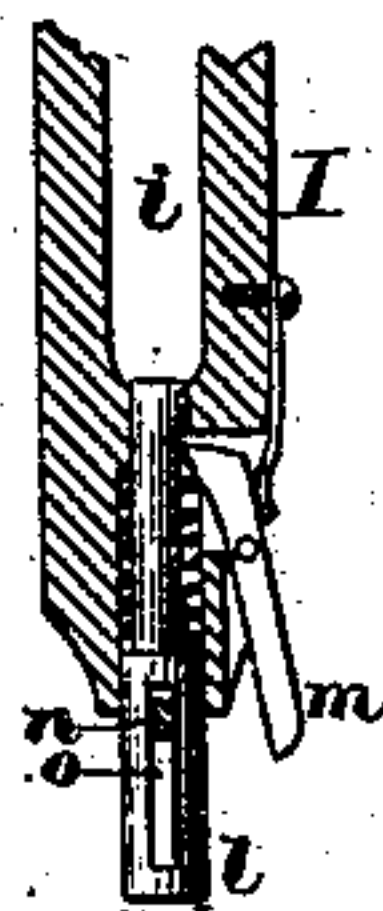
*Fig. 4*



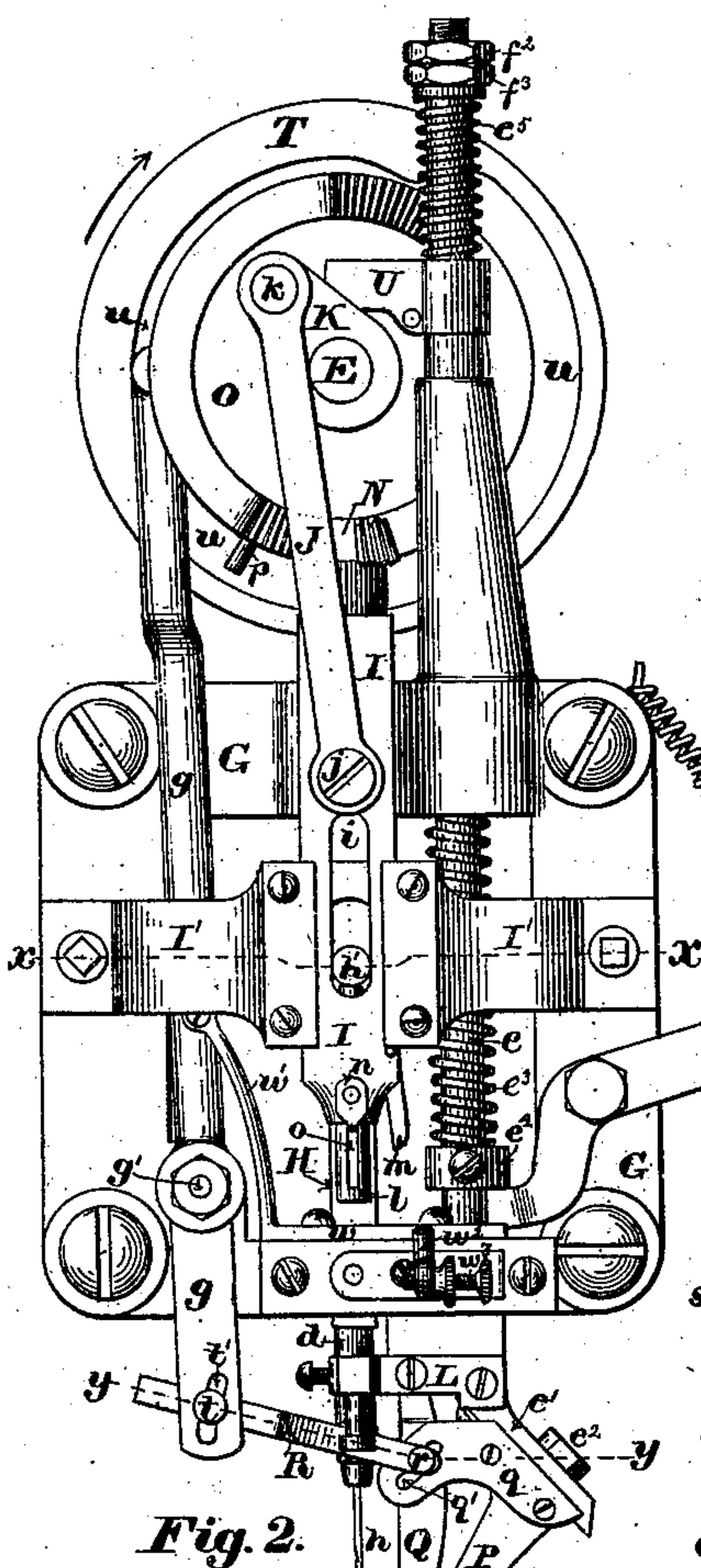
*Fig. 5.*



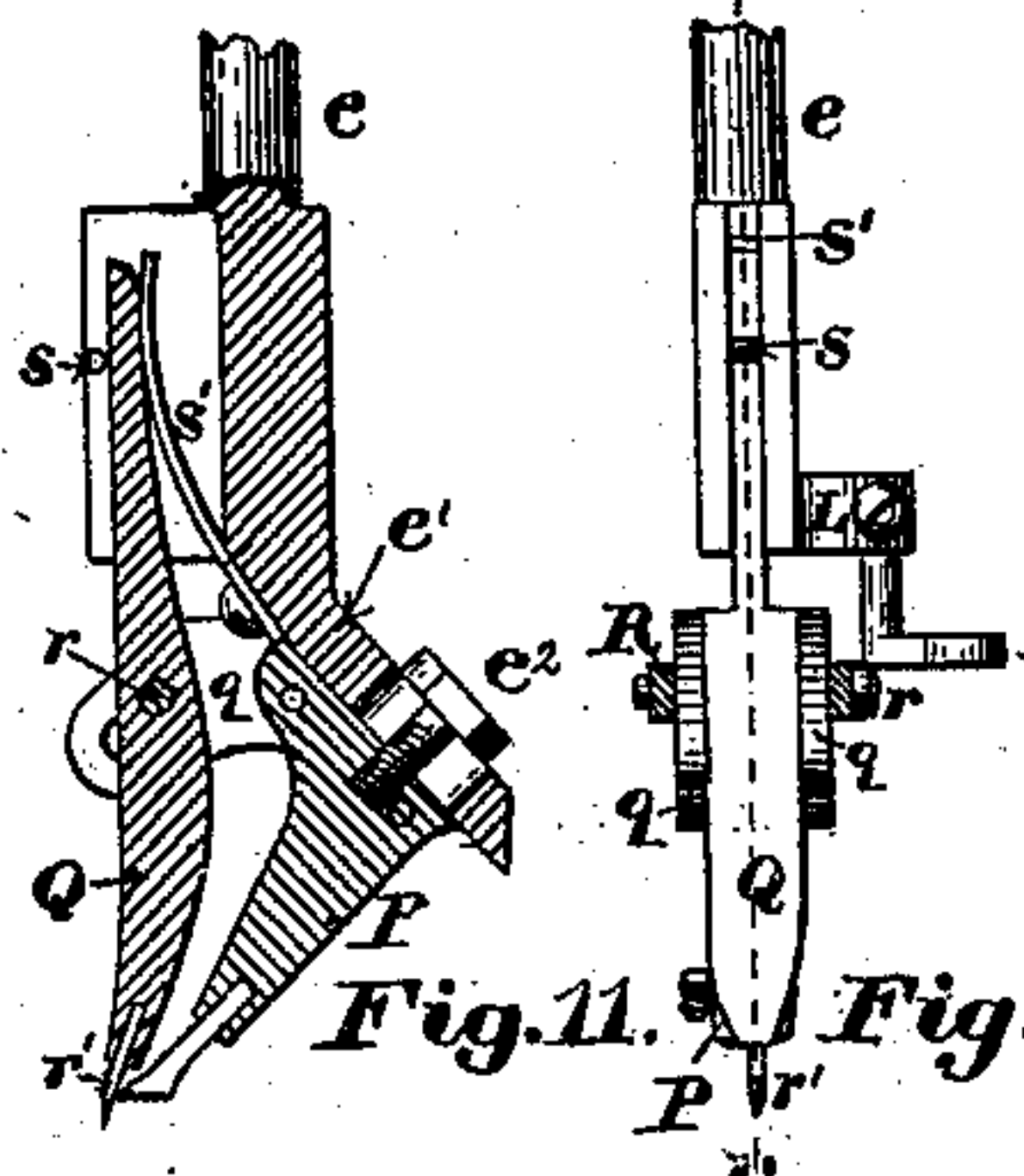
*Fig. 7.*



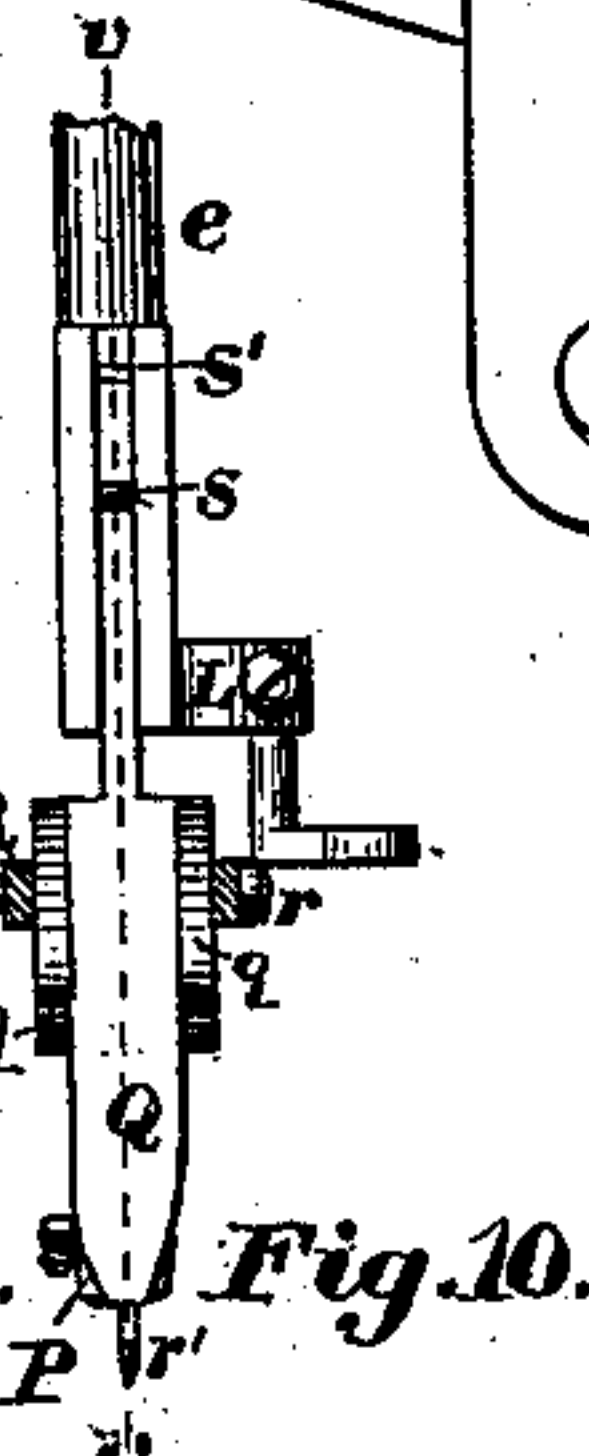
*Fig. 8.*



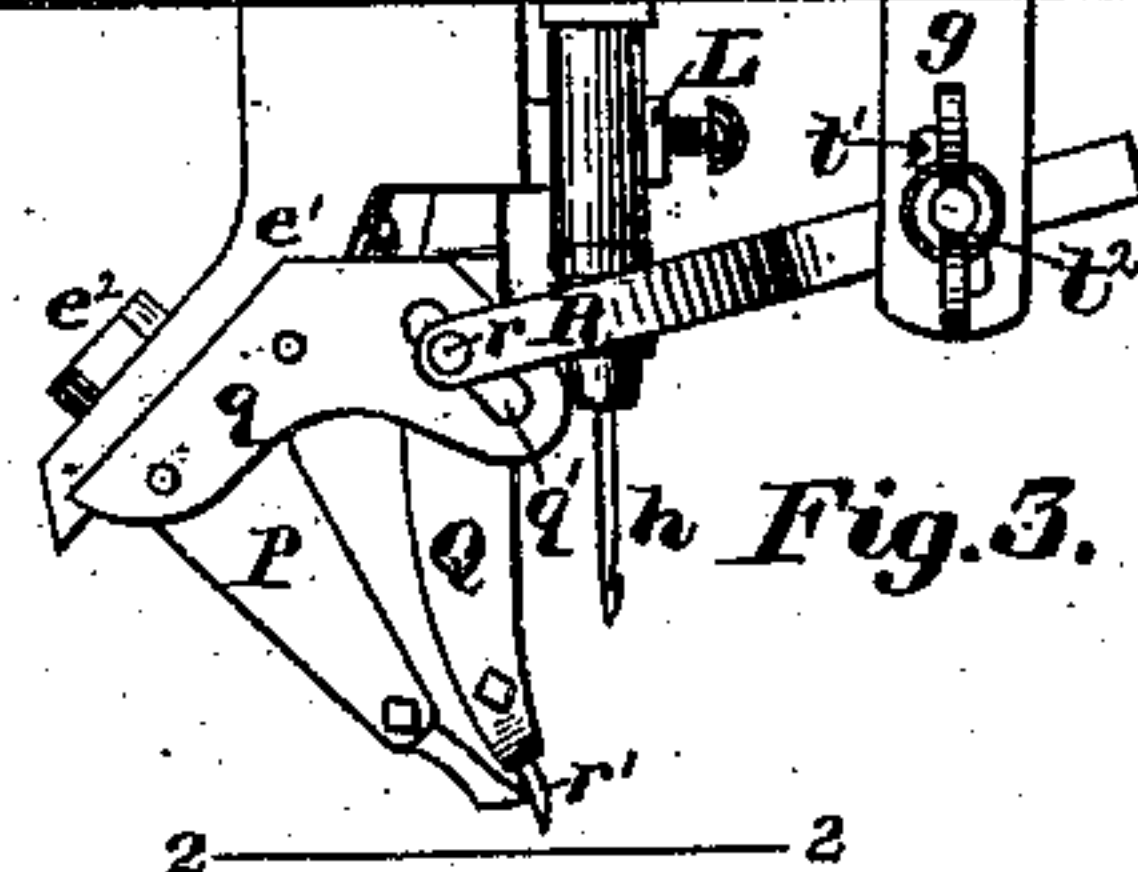
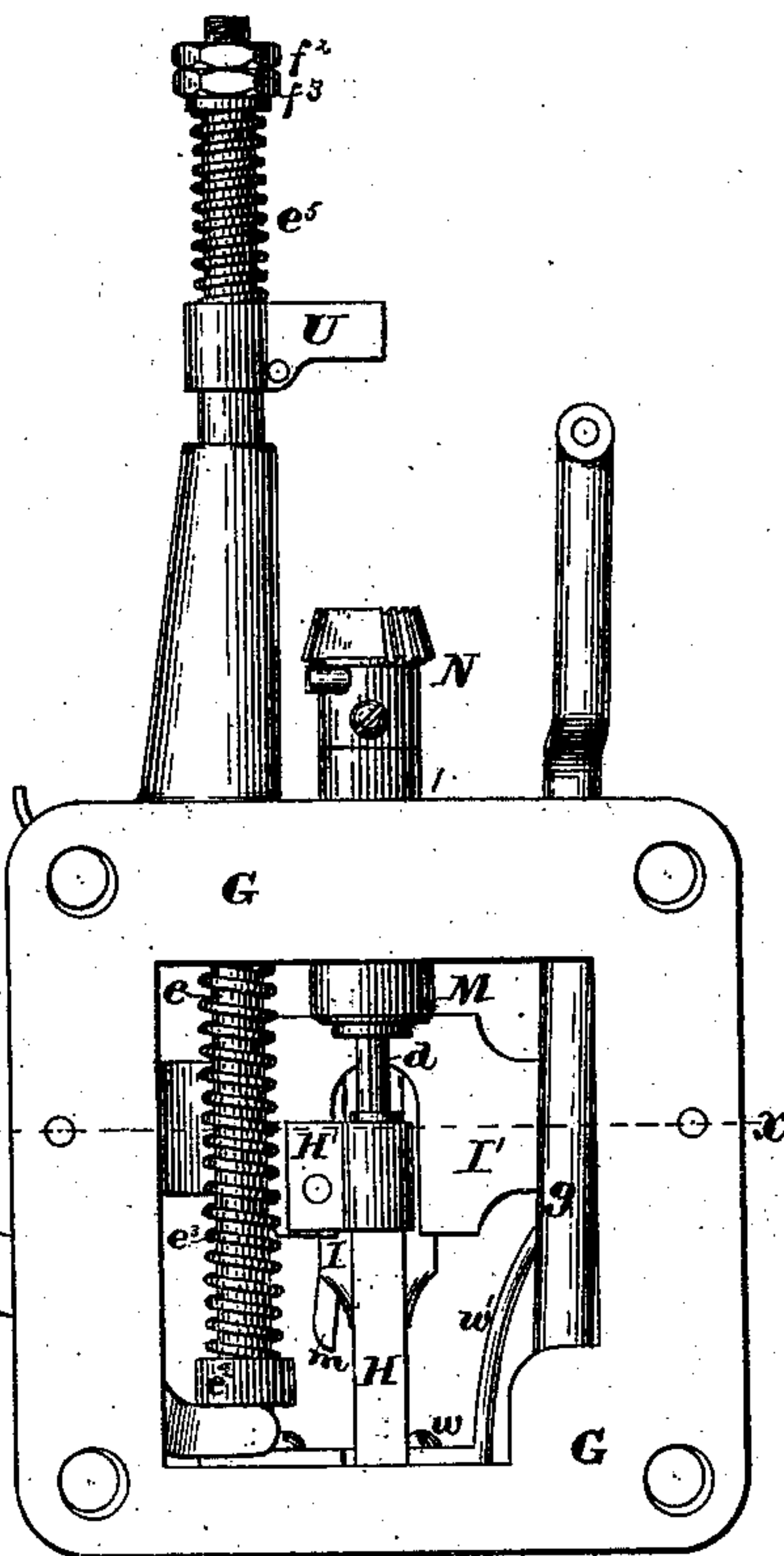
*Fig. 2.*



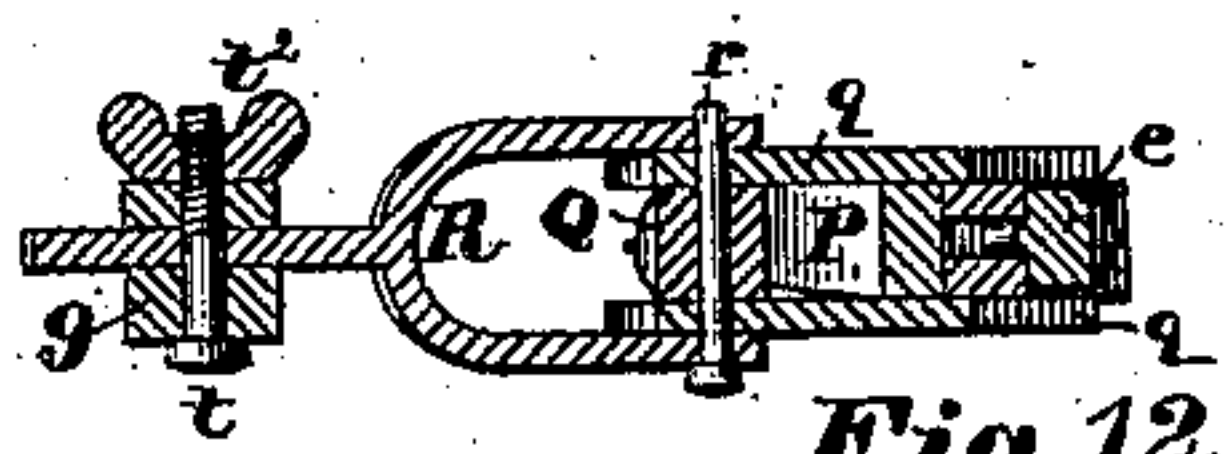
**Fig. 11.**



**Fig. 10.**



*Fig. 3.*



*Fig. 12.*

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# UNITED STATES PATENT OFFICE.

CHARLES BROWN, OF LYNN, MASSACHUSETTS, ASSIGNOR TO THE AMERICAN STAPLE SEWING MACHINE COMPANY, OF PUTNAM, CONNECTICUT.

## BOOT AND SHOE SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 272,409, dated February 20, 1883.

Application filed November 20, 1882. (No model.)

*To all whom it may concern :*

Be it known that I, CHARLES BROWN, of Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of wax-thread sewing-machines which are used for sewing the soles to the uppers of boots and shoes, and especially to the mechanism for feeding the sole and for operating and controlling the movements of the needle, and is an improvement upon the machines described in Letters Patent No. 187,874, granted to A. Leavitt and H. L. Drew, February 27, 1877, and reissue No. 9,698, granted to S. Sawyer and William Esty, May 10, 1881, original No. 174,159, dated February 29, 1876.

My invention consists in certain novel arrangements and combinations of devices, which will be readily understood by reference to the description of the drawings, and the claims to be hereinafter given.

Figure 1 of the drawings is a sectional side elevation of a machine embodying my invention. Fig. 2 is a front elevation of the working parts of the machine that are above the work, with the carrying-plate on which most of said parts are mounted. Fig. 3 is a rear elevation of the same parts, except the cam and large gear-wheel. Fig. 4 is a horizontal section on line *x x* on Figs. 2 and 3. Fig. 5 is a front elevation of the feed-cam. Fig. 6 is a section of the same on line *z z* on Fig. 5. Fig. 7 is a plan of the intermittently-acting bevel-pinion for rotating the needle. Fig. 8 is a partial vertical section of the mechanism for regulating the stroke of the needle. Fig. 9 is a plan of the device for tripping the pawl of the needle-regulating mechanism. Fig. 10 is a side elevation of the feed-point, presser-foot, and a portion of the feed-bar. Fig. 11 is a vertical section on line *v v* on Fig. 10. Fig. 12 is a section on line *y y* on Fig. 2, and Figs. 13 and 14 are respectively a front elevation and edge view of the bevel-gear wheel for intermittently rotating the needle.

A is the main frame or standard of the machine, mounted upon the legs B, and having

mounted in suitable bearings thereon the driving-shaft C, the vertical shaft D, and the cam-shaft E, connected together by suitable gearing, all constructed, arranged, and operating in the same manner as described in the before-cited patent to Sawyer and Esty.

F is the work-supporting horn, carrying in its tip the whirl *a*, and having mounted therein the inclined shafts *b* and *b'* and the vertical tubular shaft *c*, connected together and to the driving-shaft C by gearing, and operating in the same manner as in said patent to Sawyer and Esty.

G is a frame detachably secured to the front of the upper portion of the frame A, and having mounted thereon the needle-bar *d*, the presser-foot bar *e*, the presser-foot lifter *f*, and the feed-lever *g*. The needle-bar *d* is fitted to a bearing in the rectangular sleeve H in such a manner that it may be revolved therein, but cannot be moved endwise except in unison with said sleeve, and carries in its lower end the barbed needle *h*.

So far the construction and arrangement of the needle and needle-bar are the same as described in the patent to Sawyer and Esty, before cited, and the manner of reciprocating it and regulating its stroke according to the thickness of the sole being sewed is the same as described in the patent to Leavitt and Drew, before cited, excepting an improvement in the tripping device for disengaging the pawl from the regulating-bolt, the novel features of which will be hereinafter explained.

The rectangular sleeve H has secured thereto, by means of the clamp H', the pin *h'*, which projects at right angles thereto and into the slot *i* in the vertically-reciprocating bar I, located just in front of and parallel to the needle-bar, and having its bearing in the stand or bracket I', extending across and bolted to the frame G, as shown in Fig. 2. The bar I has set in its front side the pin *j*, which receives the lower end of the connecting-rod J, the upper end of which embraces the crank-pin *k*, set in the crank K, secured upon the front end of the cam-shaft E. The lower end of the bar I has fitted thereto the bolt *l*, having formed upon one side thereof a series of ratchet-teeth to engage with the pawl *m* to hold said bolt in



any desired position during the upward movement of the bar I. The bolt *l* is forced downward, when the pawl *m* is disengaged therefrom, by the tension of a coiled spring surrounding said bolt, as shown in Fig. 8, and is limited in its downward movement relative to the bar I by the stop *n*, which is secured to the bar I and projects into the slot *o* in the lower end of the bolt *l*, as shown in Figs. 2 and 8.

L is a bracket secured to and moving with the presser-foot bar *e*, the outer end of said bracket being directly beneath the lower end of the bolt *l*, in position to be struck by it when the bar I descends, and stop the downward movement of the bolt while the bar I and the pawl *m* continue to move downward, and thereby force the upper end of the bolt *l* farther into the slot *i*, in which position the pawl *m* retains it until the bar I and needle-bar *d* have completed their upward stroke.

So far the parts described are constructed, arranged, and operate substantially as described in one or both of the before-cited patents, and are not of my invention.

The upper end of the needle-bar *d* is fitted to move endwise in and be compelled to revolve with the sleeve M, mounted in a bearing in the upper bar of the frame G, so as to be free to revolve therein and prevented from moving endwise thereby, and has secured to its upper end the bevel-pinion N, having formed thereon two series of gear-teeth arranged upon opposite sides thereof and separated by two flat planes, *o'*, also opposite to each and tangent to the pitch-circle at the points equidistant between the two series of teeth, and also having set in its hub two pins, *o''*, opposite to each other, and with one of the sides of each in radial line, or nearly so, with the side of one of the end spaces of the series of teeth, as shown in Fig. 7.

O is a bevel-gear wheel mounted upon the cam-shaft E, and provided with two series of teeth arranged opposite to each other, and each consisting of as many teeth as there are spaces between the teeth of each series on the pinion N. The two portions of the wheel O which lie between the two series of teeth are turned to the same bevel as the teeth and to the same diameter as the pitch-circle, with the corners contiguous to the first space upon either side of each series of teeth rounded, as shown in Figs. 13 and 14. The wheel O also has set in its edge two pins, *p p*, opposite to each other, and in such positions relative to the two series of teeth formed thereon that said pins shall each engage with one of the pins *o''*, set in the pinion N, at the right time to insure the rotation of said pinion and the engagement of the first tooth of a series on the wheel O with the first space in a series of teeth on the pinion N. By this construction and arrangement of the pinion N and wheel O each revolution of the shaft E will cause two semi-rotations of the needle-bar in the same direction, with a period

of rest or standstill between said semi-rotations equal in duration to about twice the time occupied in making each semi-rotation. This method of imparting to the needle its intermittent semi-rotations is a great improvement upon the means employed in the machine described in the patent to Sawyer and Esty, before cited, for the reason that the rotary movement of the needle-bar is reduced one-half by doing away with the backward rotation, and for the reason that the plate K of said patent to Sawyer and Esty is dispensed with, thus very materially reducing the power required to operate the machine and causing the machine to run very much stiller.

The presser-foot P is adjustably secured to the angular lip *e'*, projecting from the lower end of the presser-bar *e*, by means of the bolt *e''*, which passes through a slot in said lip, as shown in Fig. 11. The presser-bar *e* is mounted in bearings in the frame G in a vertical position in such a manner that it may be moved vertically therein, and is prevented from rotating in said bearings by its lower portion being made rectangular in cross-section and fitted to a bearing of corresponding shape. The presser-foot P has secured to each side thereof a plate, *q*, in each of which is formed a curved inclined slot, *q'*, to receive the fulcrum-pin *r*, upon which is mounted the feed-point lever Q, the lower end of which is provided with the steel feed-point *r'*, and the upper end of which extends upward into a slot formed in the rectangular portion of the bar *e*, between the bottom of said slot and the pin *s*, against which the upper end of said lever is pressed by the spring *s'*, secured to the bar *e*, as shown in Fig. 11.

To the pin *r* is pivoted one end of the forked link R, the opposite end of which is adjustably pivoted to the lower end of the lever *g* by means of the bolt *t*, which passes through the curved slot *t'* in said lever, and the thumb-nut *t''*, as shown in Figs. 2 and 12. The lever *g* is fulcrumed at *g'*, and carries at its upper end a truck or stud, which fits into and is acted upon by the path *u* of the cam T, to impart thereto a vibratory motion about its fulcrum *g'* for the purpose of operating the feed-point lever. That portion T' of the cam T which causes the feeding of the material is made adjustable upon the main portions of the cam by means of the bolts *u' u'* passing through slots in the main body of the cam T and screwing into the section T', as shown in Figs. 5 and 6, for the purpose of varying the throw of the feed-point. Another means of varying the feed is by moving the link R toward or from the fulcrum *g'* of the lever *g* by means of the bolt *t* and nut *t''*.

Upon the upper side of the lower bar of the frame G, and in front of the needle and presser bars, is mounted, so as to be movable endwise thereon, the bar *w*, provided with the arm *w'*, the upper end of which is pivoted to the lever *g*, and with the lateral projection *w''*, in



which is adjustably secured the screw stop or trip  $w^3$ , the object of which is to trip the pawl  $m$  when the bar  $I$  descends.

The construction, arrangement, and mode of operating the feed mechanism and tripping the pawl  $m$  are great improvements upon the devices described in the patents to Sawyer and Esty and Leavitt and Drew, before cited, in that very much less weight has to be moved and the motions of operating parts are more generally continuous in the same direction, instead of having to be started from a state of rest, moved in one direction, brought to a standstill, and then moved in the opposite direction, as was the case with the reciprocating plate which rotated the needle and operated the feed-point in the Sawyer and Esty machine, and performed the same operations and tripped the pawl of the needle-lifting mechanism in the Leavitt and Drew machine.

The presser-bar  $e$  is forced downward by the spring  $e^3$ , surrounding said bar between its upper bearing and the collar  $e^4$ , and is raised for the purpose of placing the work upon the horn and beneath the presser-foot  $P$  by means of the hand-lever  $f$ , the inner end of which engages with the under side of the collar  $e^4$ , the outer end of said lever being held up, when not depressed by the hand of the operator, by means of the spring  $f'$ . The presser-bar  $e$  projects above its upper bearing, and has loosely fitted thereto, so as to be free to move up and down thereon, the arm  $U$ , which carries a pawl (not shown) to engage with ratchet-teeth formed in the side of the bar  $e$ , said pawl being acted upon by a cam on the shaft  $E$ , and the arm  $U$  being forced downward by the spring  $e^5$ , all these parts being constructed, arranged, and operated substantially as shown and described in the patent to Sawyer and Esty, before cited, and forming no part of my present invention. The tension of the spring  $e^5$  is regulated by means of the nuts  $f^2$  and  $f^3$  in a well-known manner. The line 2 2 in Figs. 2 and 3 indicates the level of the top of the work-supporting horn  $F$ .

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

1. In combination with the needle-bar of a sewing-machine, the sleeve  $M$ , connected with

said needle-bar so as to compel it to revolve therewith while it is free to be reciprocated therein, segmentally-toothed gear-wheels arranged and adapted to impart to said needle-bar a series of semi-rotations in the same direction at regular and equal intervals, with a defined and predetermined period of rest after each semi-rotation, substantially as described.

2. In combination with the reciprocating needle-bar of a sewing-machine, the sleeve  $M$ , the bevel-pinion  $N$ , provided with two series of teeth and two flat planes between them, and the pins  $o^2$   $o^2$ , and the bevel-wheel  $O$ , provided with two series of teeth, two smooth surfaces connecting said series of teeth, and the pins  $p$   $p$ , all constructed, arranged, and adapted to operate substantially as and for the purposes described.

3. The feed-point lever  $Q$ , pivoted upon the movable fulcrum-pin  $r$ , in combination with the presser-bar  $e$ , the pin  $s$ , and spring  $s'$ , all arranged and adapted to operate substantially as described.

4. The combination of the slotted presser-bar  $e$ , the presser-foot  $P$ , the slotted plates  $q$   $q$ , the feed-point lever  $Q$ , the movable fulcrum-pin  $r$ , pin  $s$ , spring  $s'$ , forked link  $R$ , the lever  $g$ , and the cam  $T$ , all constructed, arranged, and adapted to operate substantially as and for the purposes described.

5. The combination of the presser-bar  $e$ , the feed-point lever  $Q$ , mounted upon a movable fulcrum-pin, the pin  $s$ , the springs  $s'$ , the forked link  $R$ , the lever  $g$ , and the cam  $T$ , provided with the adjustable section  $T'$ , substantially as described.

6. In combination with the vertically-reciprocating bar  $I$ , movable bolt  $l$ , pawl  $m$ , and stop-bracket  $L$ , the sliding bar  $w$ , the adjustable stop-screw  $w^3$ , the lever  $g$ , and the cam  $T$ , substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 8th day of November, A. D. 1882.

CHARLES BROWN.

Witnesses:

E. A. HEMMENWAY,  
WALTER E. LOMBARD.