

(Model.)

5 Sheets—Sheet 1.

J. STEWART, Jr.
SEWING MACHINE.

No. 432,449.

Patented July 15, 1890.

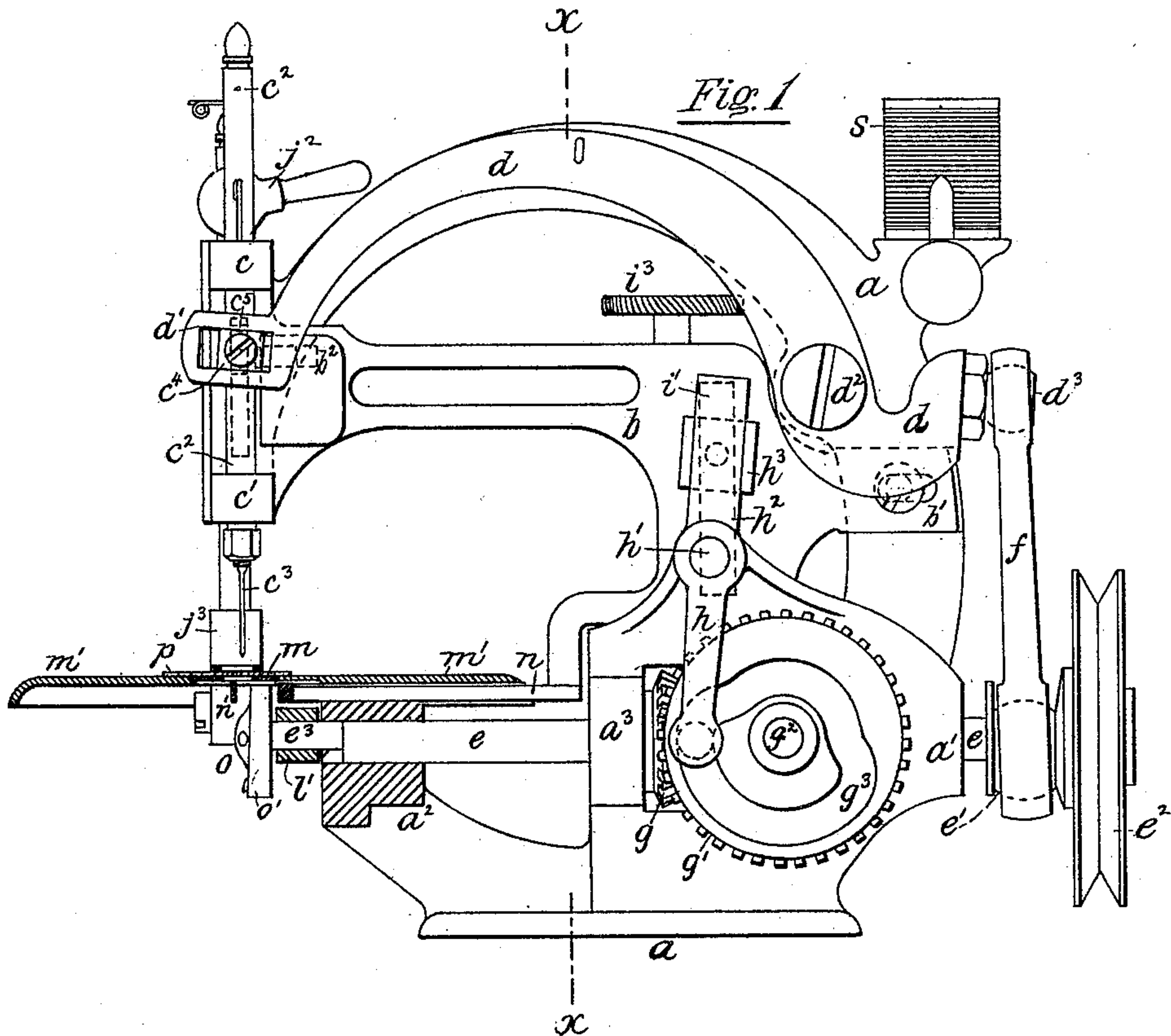


Fig. 10

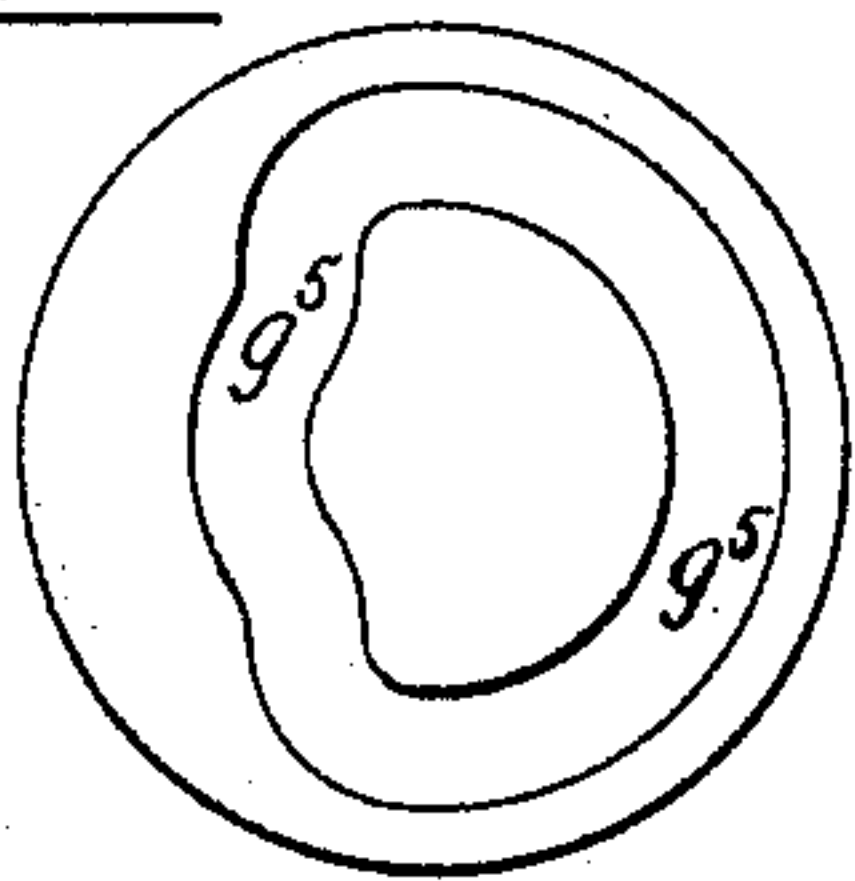
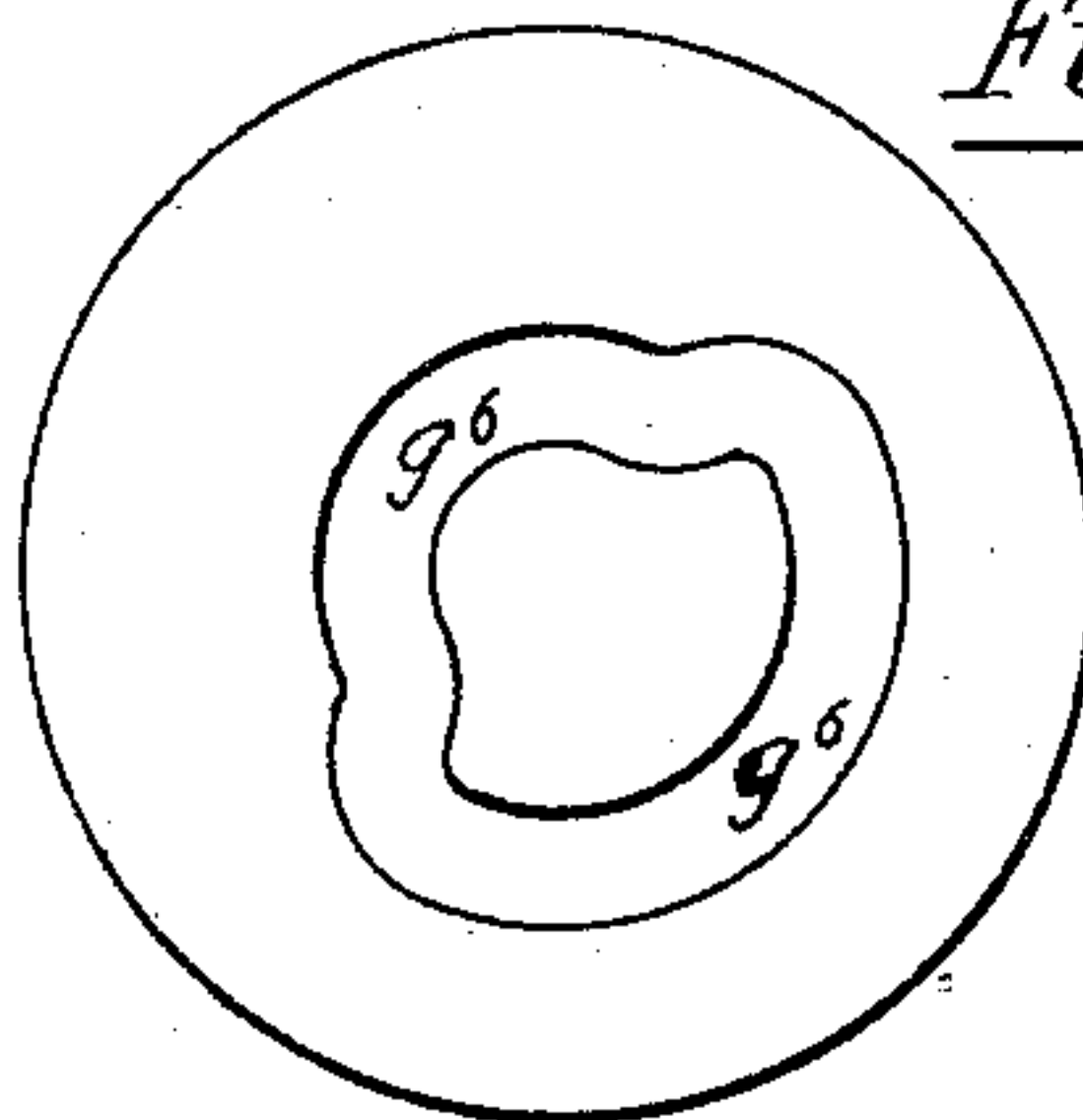


Fig. 11



Witnesses

H. D. Williams

B. F. Mitchell.

James Stewart, Jr.

Inventor

per Alfred Theobald
att.

(Model.)

5 Sheets—Sheet 2.

J. STEWART, Jr.
SEWING MACHINE.

No. 432,449.

Patented July 15, 1890.

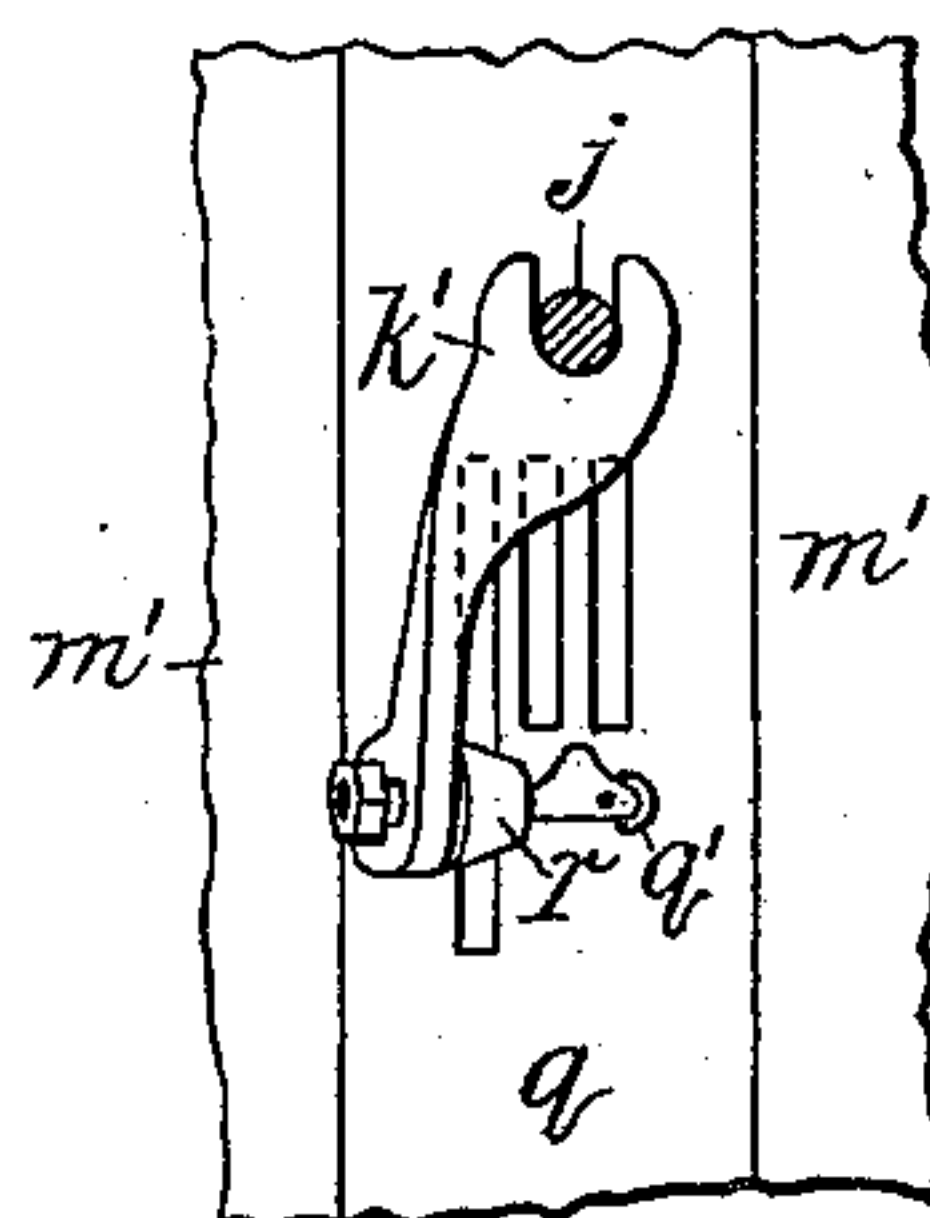
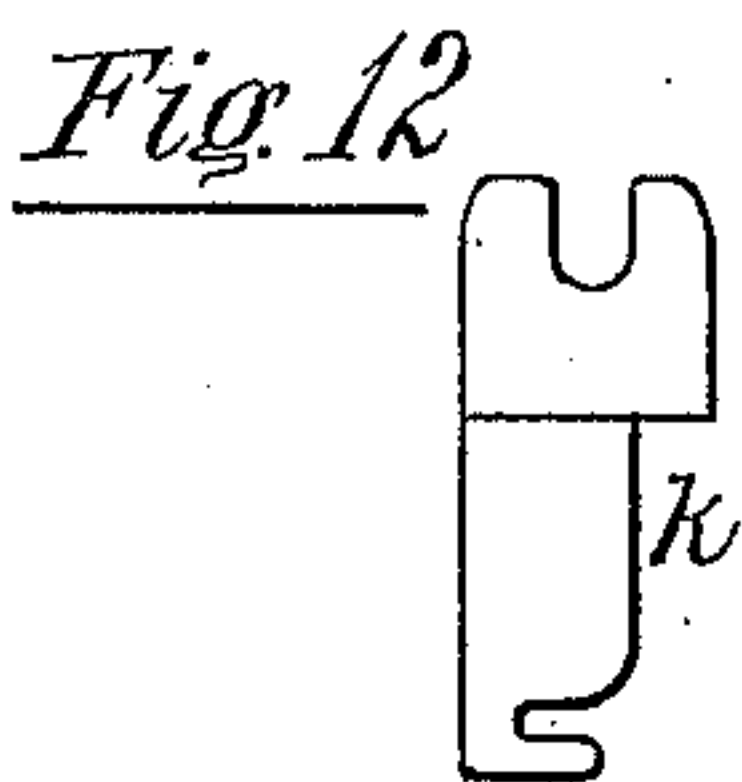
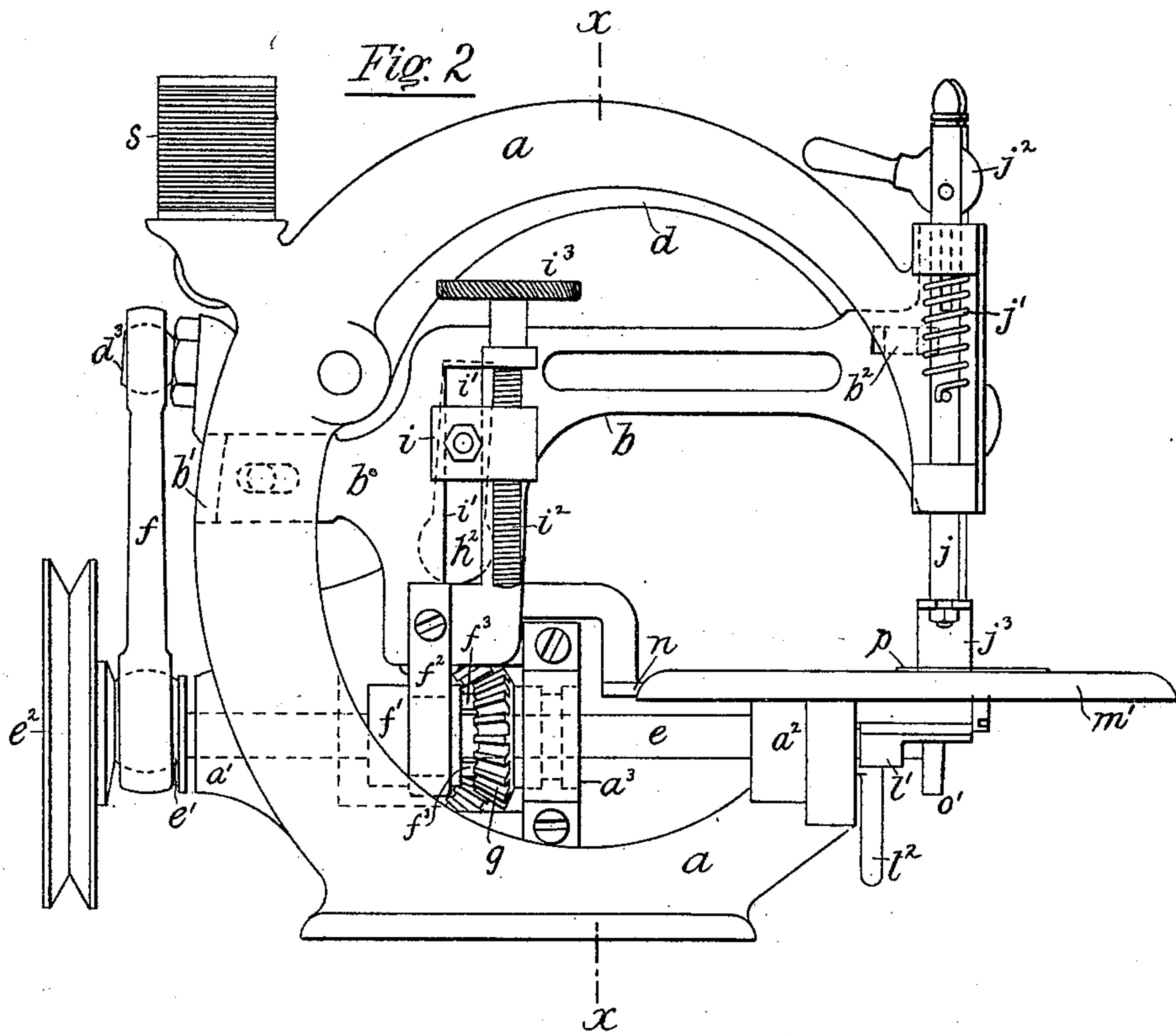


Fig. 13

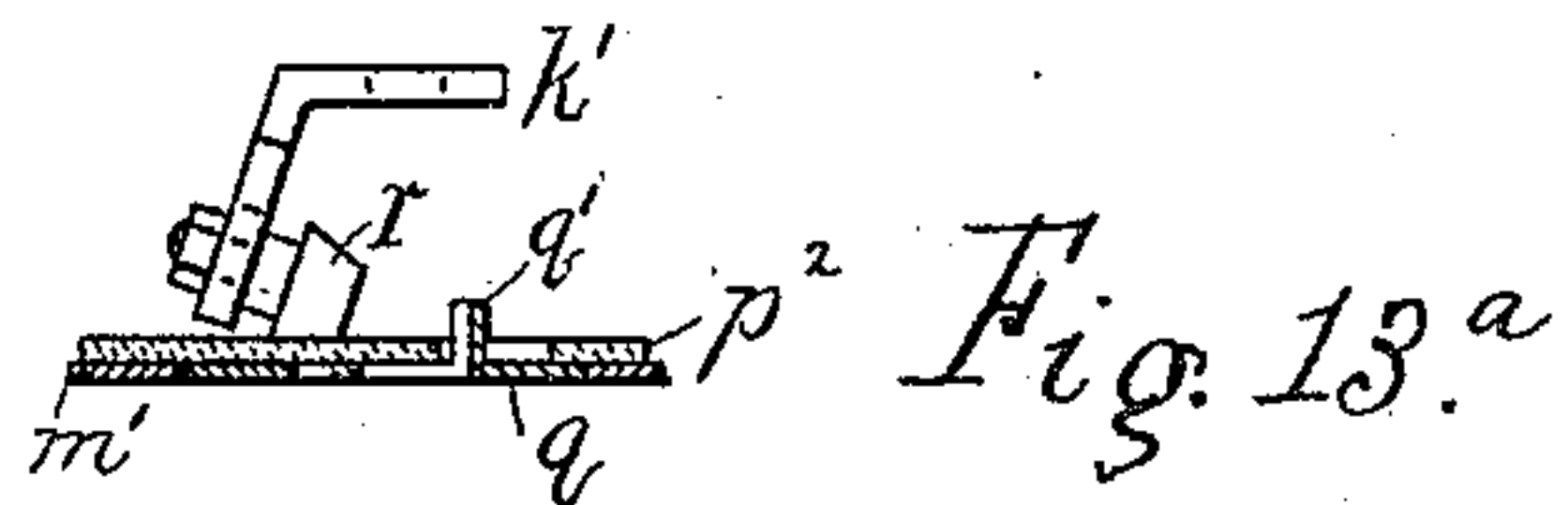


Fig. 13^a

Witnesses

H. D. Williams
B. F. Mitchell.

James Stewart Jr.

Inventor

per Alfred H. Cook,
Att'y.

(Model.)

5 Sheets—Sheet 3.

J. STEWART, Jr.
SEWING MACHINE.

No. 432,449.

Patented July 15, 1890.

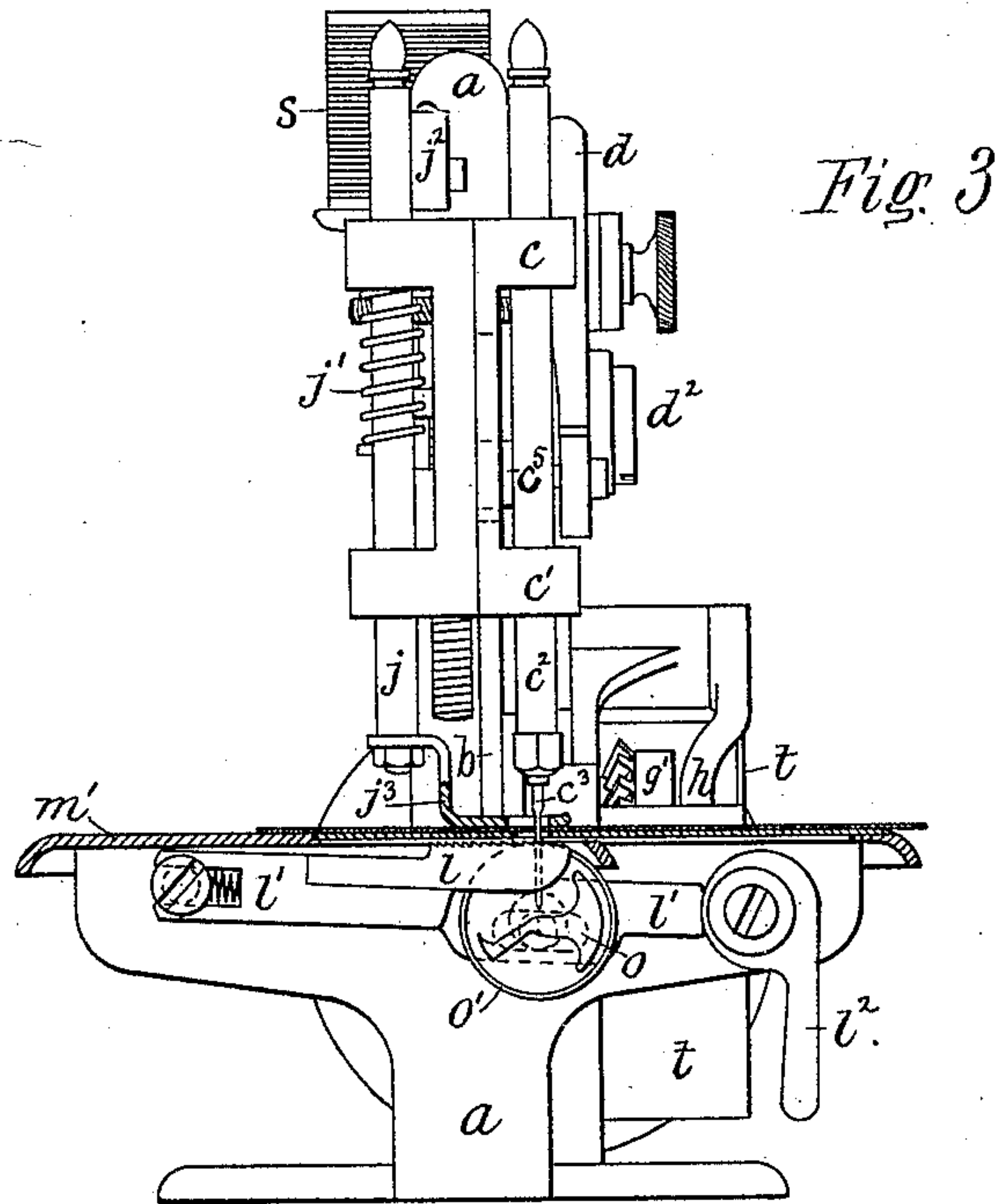


Fig. 3

Fig. 14

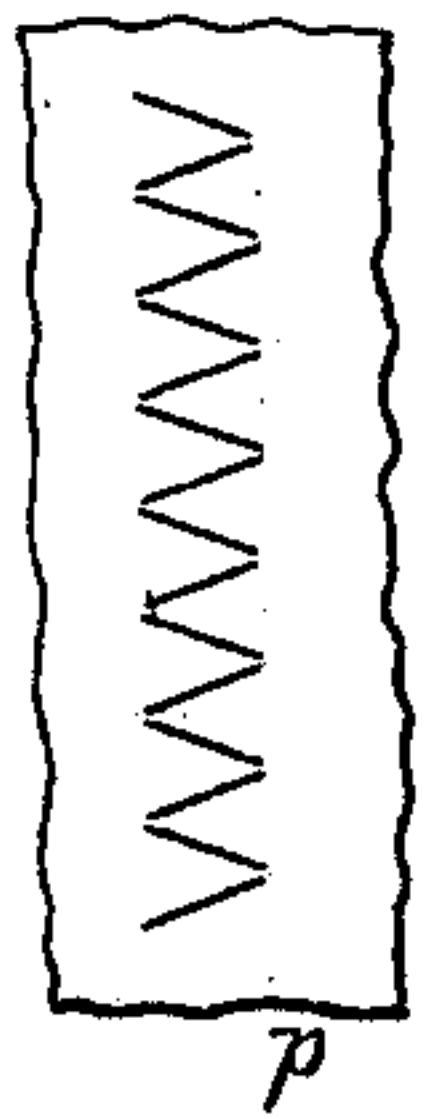


Fig. 15

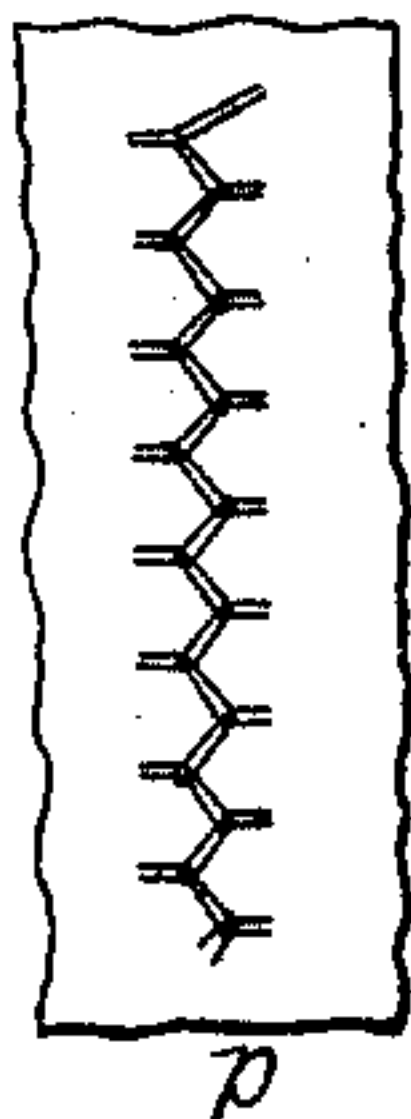


Fig. 16

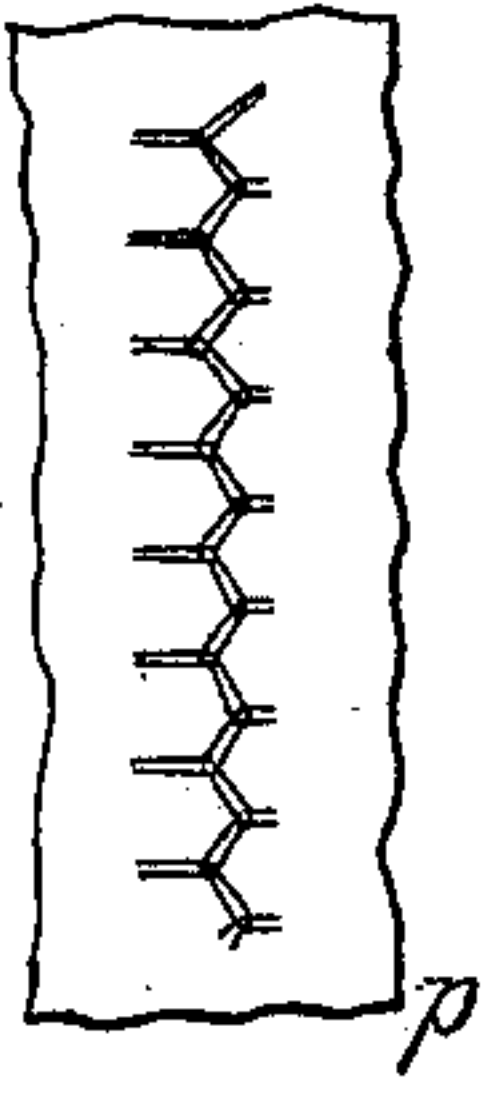


Fig. 17

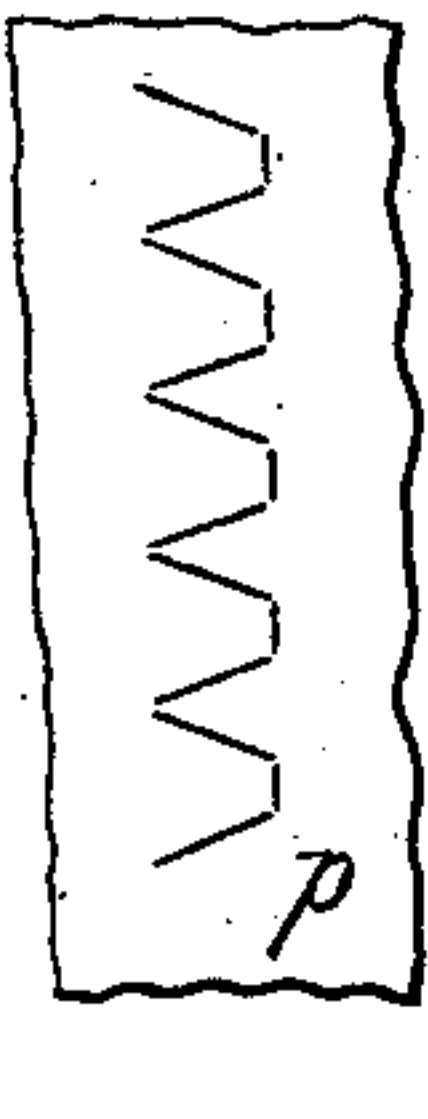


Fig. 18

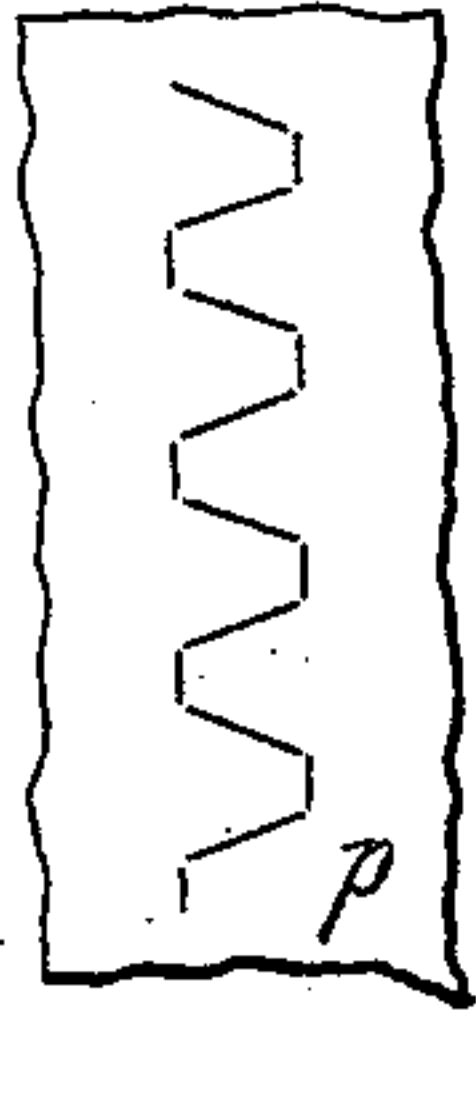


Fig. 19

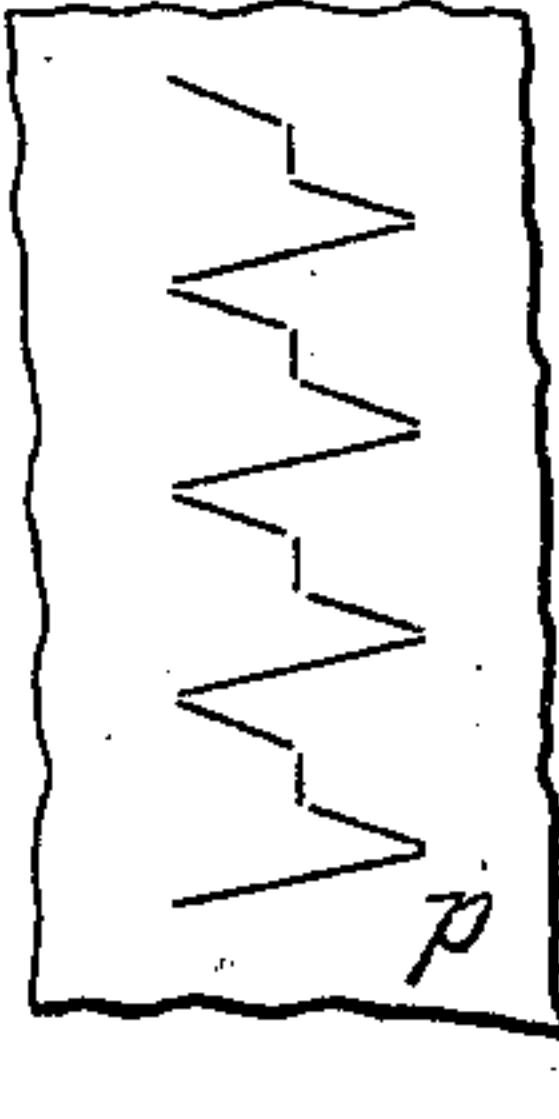


Fig. 20

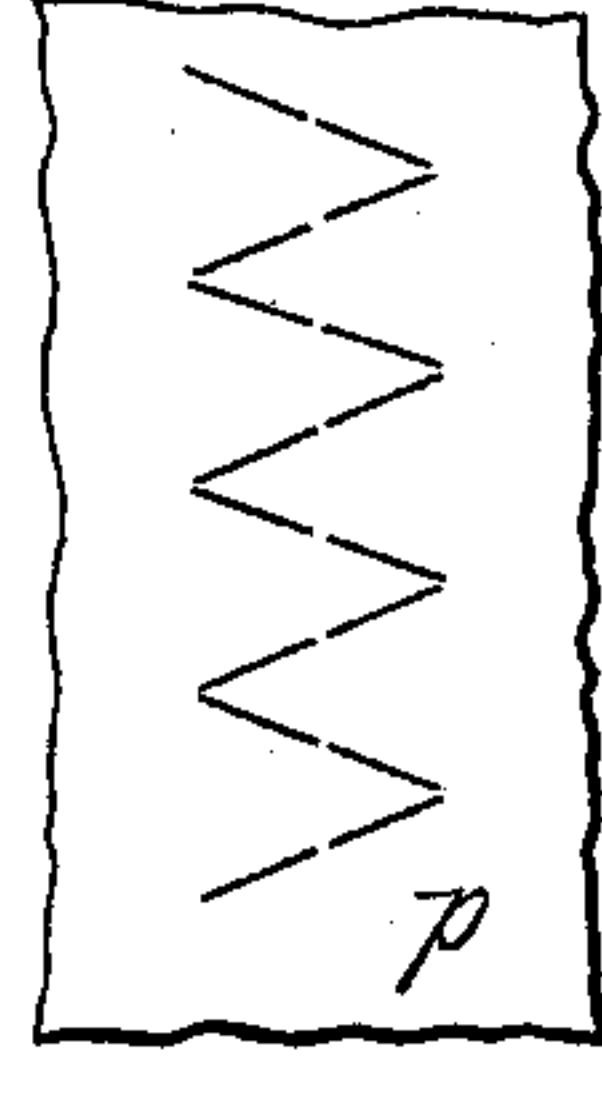


Fig. 21

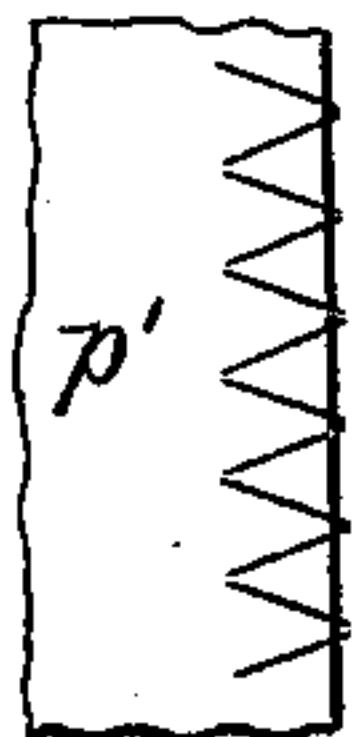


Fig. 22

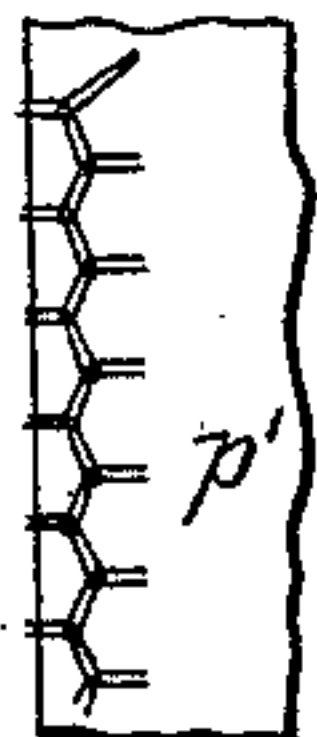


Fig. 23



Witnesses

H. D. Williams
B. F. Mitchell

James Stewart, Jr.
Inventor
per Alfred Theobald
Atty.

(Model.)

5 Sheets—Sheet 4.

J. STEWART, Jr.
SEWING MACHINE.

No. 432,449.

Patented July 15, 1890.

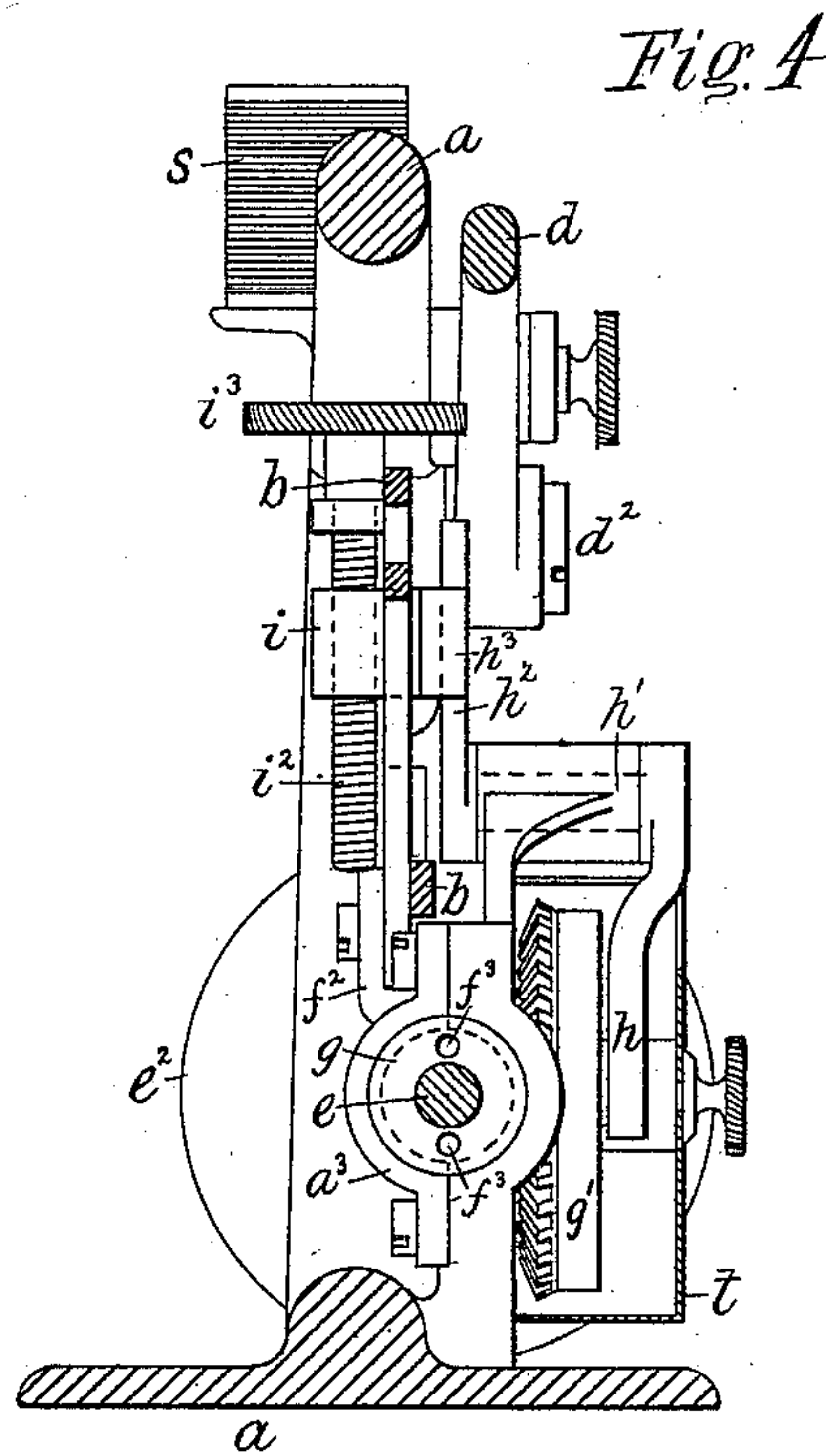
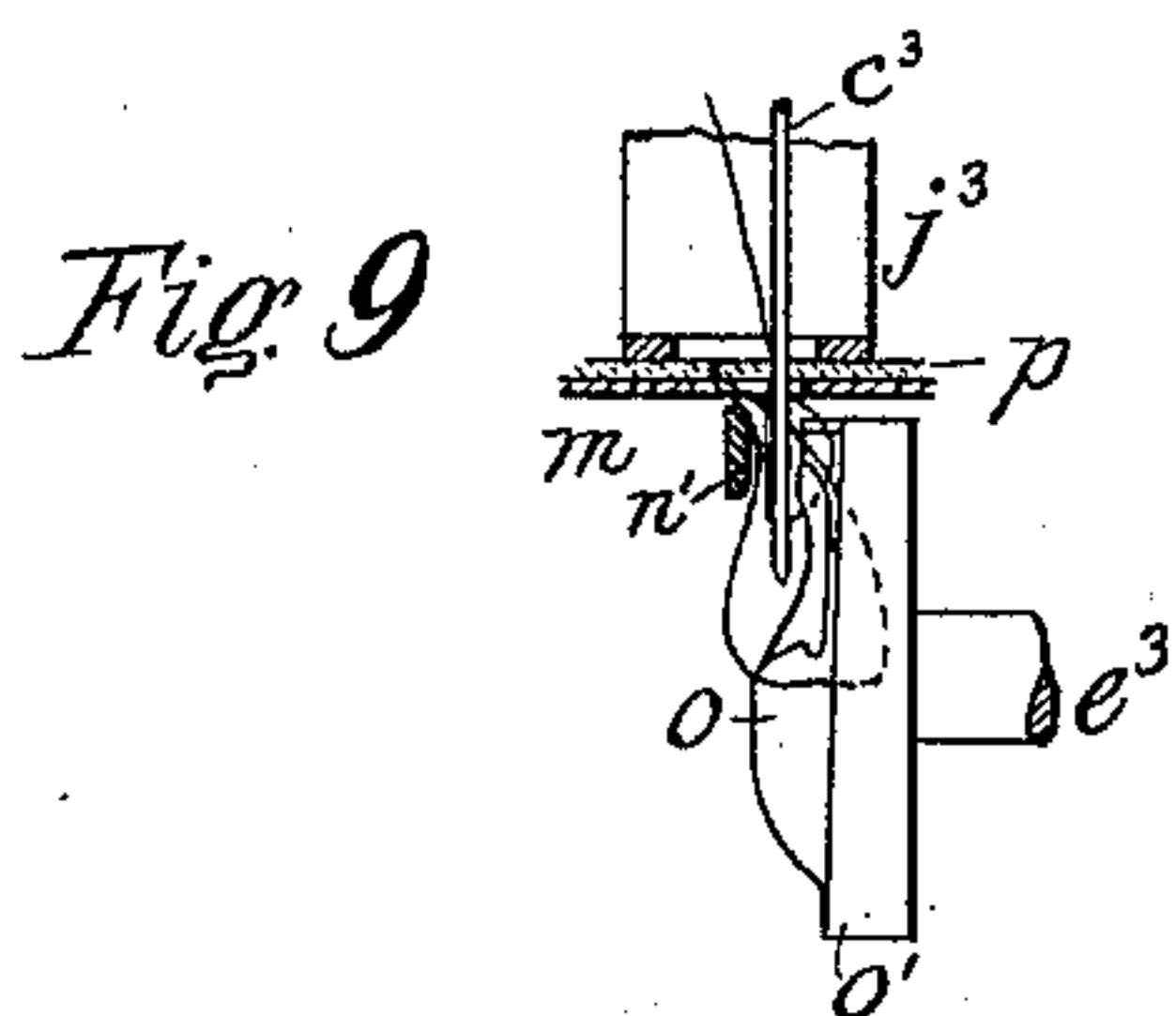
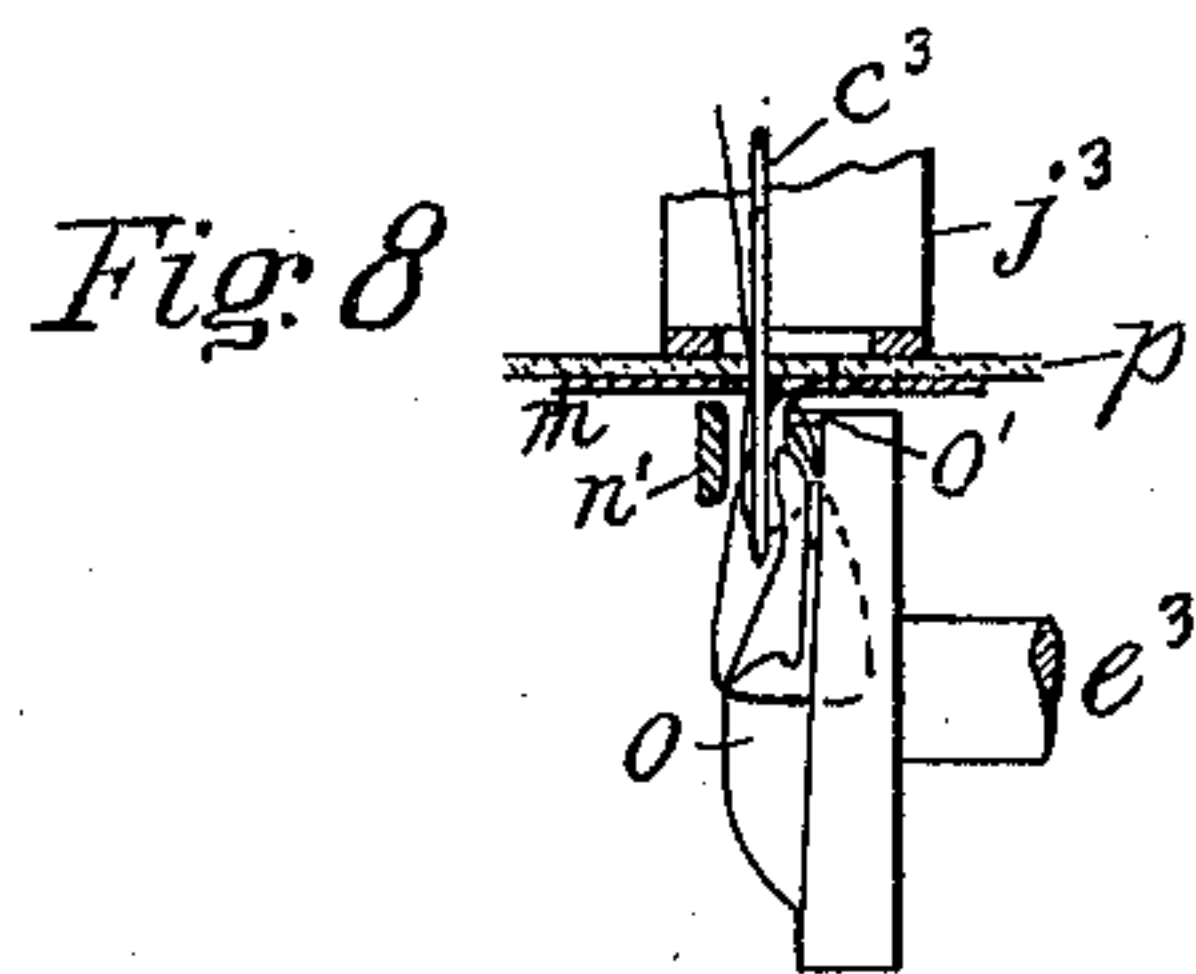


Fig. 5

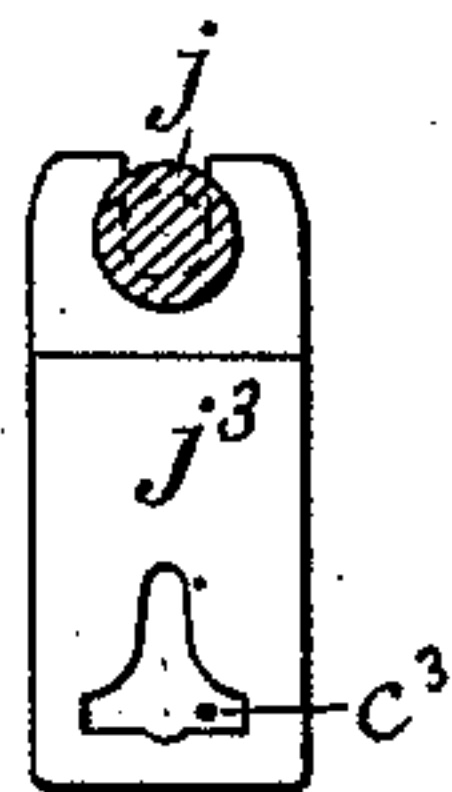


Fig. 6

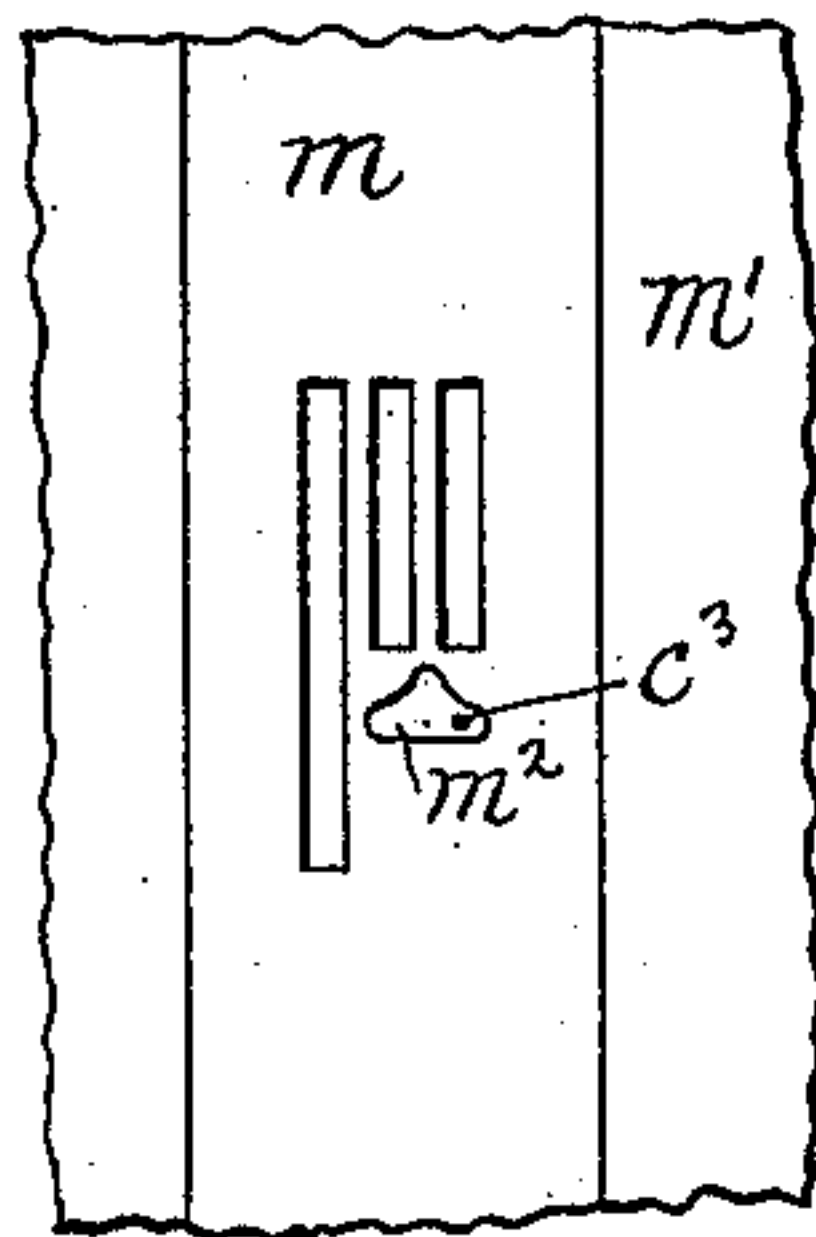
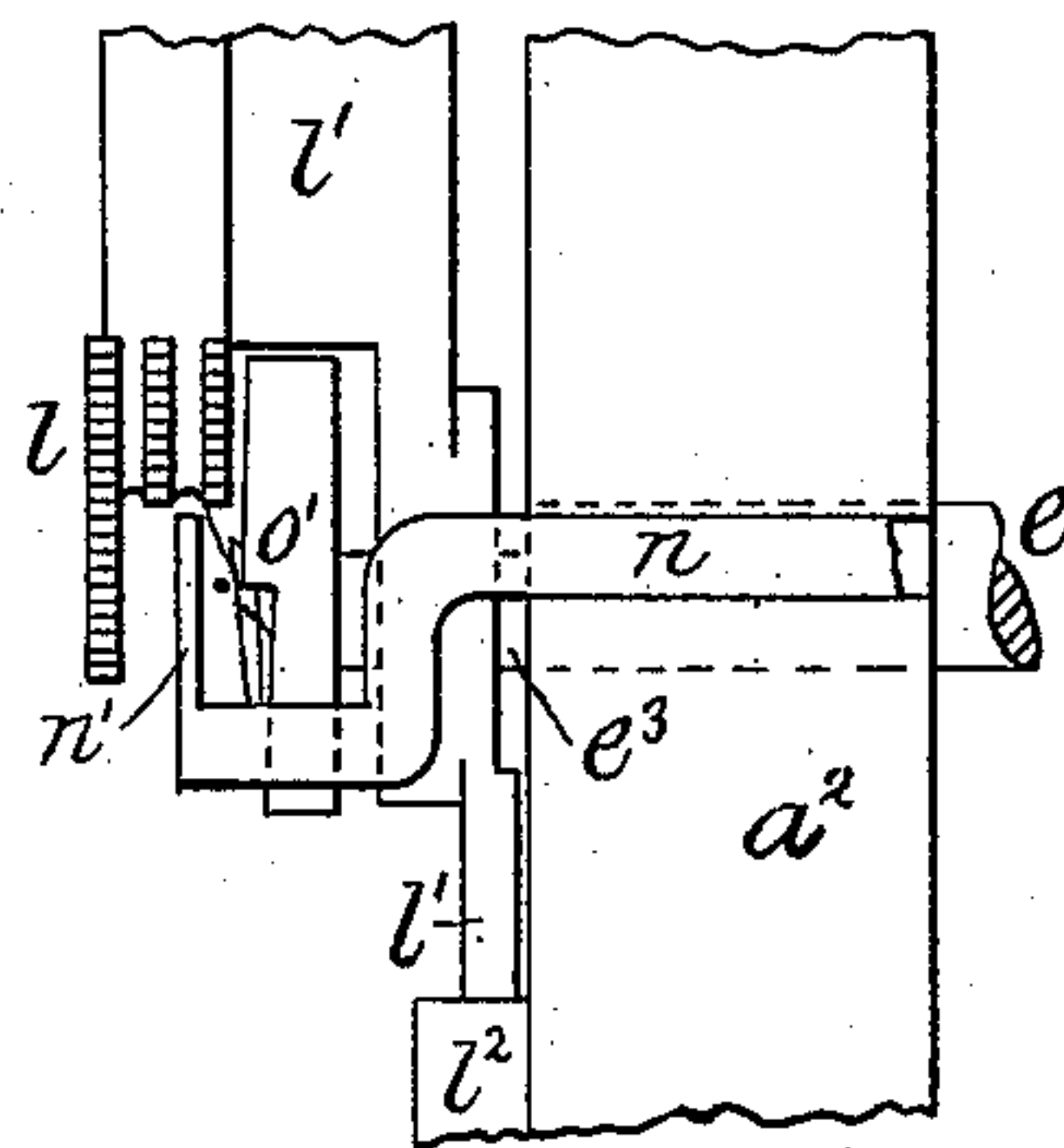


Fig. 7



Witnesses

H. D. Williams

B. F. Mitchell

James Stewart Jr.
Inventor
per Alfred Sheddlock
Atty.

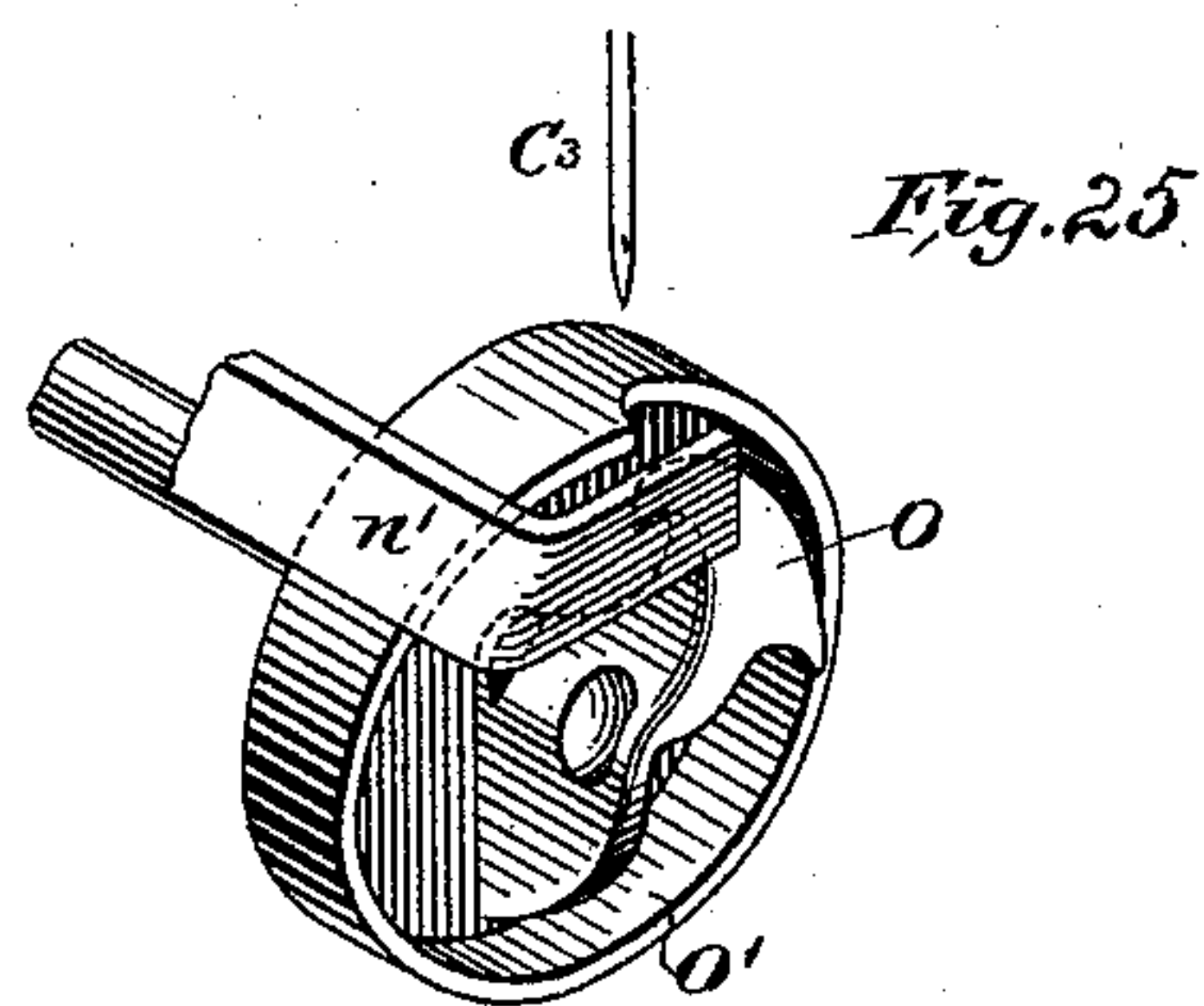
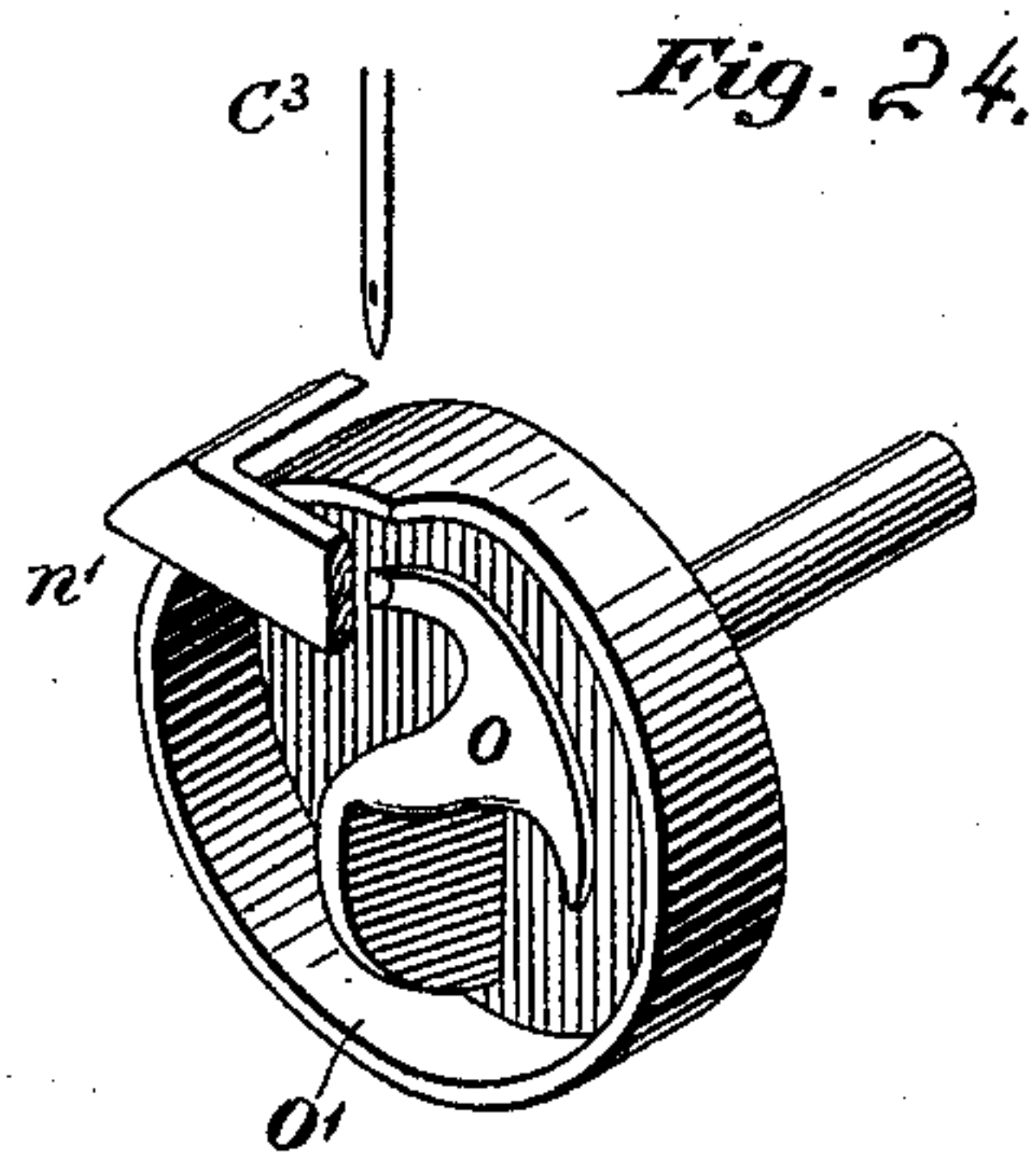
(Model.)

5 Sheets—Sheet 5.

J. STEWART, Jr.
SEWING MACHINE.

No. 432,449.

Patented July 15, 1890.



James Stewart Jr.
Inventor

Witnesses

S. H. Starratt.
Wm. D. Brown.

By his Attorney Alfred Hewlock

UNITED STATES PATENT OFFICE.

JAMES STEWART, JR., OF YONKERS, NEW YORK.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 432,449, dated July 15, 1890.

Application filed November 25, 1887. Serial No. 256,060. (Model.)

To all whom it may concern:

Be it known that I, JAMES STEWART, Jr., a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to a machine adapted not only for ordinary straight sewing, but also to fancy, ornamental, overedge, and eyelet-hole sewing.

Its object is to produce a simple and effective machine, readily adjustable, and adaptable to the particular stitch to be made, which end I attain by a novel organization of instrumentalities.

The subject-matter claimed is hereinafter specified. Unless otherwise designated the parts are of usual construction.

My improved organization involves the lateral movement or traverse of the stitch-forming mechanism in alternately-opposite directions across the line of feed of the goods. Where the loop is formed on the under side of the goods by means of a rotating hook, I form on the front face thereof an annular flange, the working-edge of which is inclined to the plane of its rotation or the line of traverse of the needle, so as to deflect the thread relatively to the path of the needle at proper intervals in co-operation with a pin or stud lying in close proximity to the path of the needle and oscillating laterally therewith and with the hook to control the thread in forming the loop. The driving-wheel, the driving-shaft, the rotating hook, the looper-stud, and the needle-bar, in addition to their usual movements, all reciprocate transversely to the line of feed, being mounted in or carried by a plate or frame sliding on the main frame and provided with a bearing embracing a journal on the driving-shaft, which carries a pinion gearing with a corresponding wheel carrying a detachable pattern-cam connected with the frame by adjustable levers, so that various designs and kinds of stitches may be produced by varying the relative movements of the parts.

The accompanying drawings show so much

of a single-thread sewing-machine embodying my improvements as is necessary to illustrate the subject-matter claimed.

Figure 1 shows a front elevation of the machine or that side on which the pattern-cam is located with the cover of the pattern-cam removed and the table and adjacent parts in section. Fig. 2 is a similar elevation of the rear or opposite side of the machine. Fig. 3 is a view in elevation of the stitch-forming end of the machine with the table in section. Fig. 4 is a vertical transverse central section on the line $x x$ of Figs. 1 and 2, looking toward the driving-wheel end of the machine. Fig. 5 is a plan of the presser-foot ordinarily employed; Fig. 6, a plan of part of the table; Fig. 7, a plan of the feeding and loop-forming mechanism under the table. Fig. 8 shows a view in elevation, partly in section, of the stitch-forming mechanism detached, with the parts in the position they occupy when the needle begins to rise in advance of the medial line of the needle; and Fig. 9, a similar view of the same parts during the corresponding operation in their retracted position or that nearest the driving-wheel end of the machine. Fig. 10 is an outline face view of a pattern-cam adapted to produce the stitch shown in Fig. 17, and Fig. 11 a similar view of a pattern-cam adapted to produce the stitch shown in Fig. 18. Fig. 12 shows a plan of a presser-foot adapted for overedge stitching. Fig. 13 shows a plan, and Fig. 13^a a vertical transverse section, of a presser-foot and guide adapted for forming eyelets. Figs. 14 to 23, both inclusive, illustrate some of the various kinds of stitching which my improved machine is capable of producing. Figs. 24 and 25 are perspective views, on an enlarged scale, of my improved stitch or loop forming mechanism.

The drawings show a G-shaped stationary or main frame a . A U-shaped plate or frame is provided with horizontally-elongated slots near its upper front and rear ends, which slide on guide-pins $b' b^2$ on the upper arm of the main frame a , thus leaving the plate b free to slide horizontally and longitudinally thereon. A needle-bar c^2 reciprocates vertically in bearing-blocks $c c'$ on the front end

of the sliding frame b and carries a needle c^3 on its lower end. A block c^4 , pivoted on the needle-bar between its bearings, slides in a horizontal slot in the free end of an arm d ,
 5 rocking on a pivot d^2 on the main frame a and having a spherical stud d^3 on its short arm, connected with a similar eccentric e' on the driving-shaft E by a connecting-rod F . A guide-block e^5 , secured to the rear side
 10 of the needle-bar, works in a vertical slot in the slide-frame, thus preventing the needle-bar from turning axially in its bearings. A bearing-arm f^2 , rigidly secured to and pendent from the sliding frame or plate, embraces a grooved journal in a collar f' , fixed
 15 on the driving-shaft, which shaft is thus caused to slide longitudinally or move endwise in its bearings $a' a^2$ in the main frame coincidently with the reciprocating movements of the slide-frame or plate in its bearings. The driving-shaft also turns freely in its bearings, being driven by a belt encircling a driving wheel or pulley e^2 thereon. It also moves freely endwise through a bevel-
 25 pinion g , mounted in a fixed bearing a^3 in the main frame in such manner as to rotate freely therein in a fixed plane or without end-play. Pins f^3 , projecting from the face of the grooved collar f' parallel with the driving-shaft, enter holes in the bevel-pinion, thus forming a feather, which causes the pinion and collar to rotate together, while leaving the latter free to move to and fro relatively to the former. A bevel-wheel g' turns on a stud g^2
 35 on the main frame and meshes with this bevel-pinion g . A face-cam g^3 is secured to or formed on the outer side of the bevel-wheel g' . A lever h on a short shaft h' , rocking in a bearing on the main frame, carries on its
 40 free end a guide-pin or friction-roller working in the cam g^3 . An arm h^2 on the rock-shaft is embraced by the flanges of an adjusting-block h^3 , pivoted in a slide-block i , adjustable vertically in a slot i' in the sliding frame. An adjusting-screw i^2 , provided with a milled head i^3 and turning in a bearing in the sliding frame, passes through this slide-block, and thus adjusts it higher or lower in the slide-frame, the flanged block h^3 sliding
 50 correspondingly on the rocking arm h^2 . This adjustment correspondingly regulates the throw or amount of lateral reciprocation imparted to the sliding frame and its connected parts by means of the face-cam, the range of movement of course being greater the farther the adjusting-block is set from the axis of the rock-shaft h' . When the center of this block coincides with the axis of that shaft, the slide-frame will remain unmoved, and the mechanism will be in condition for ordinary straight sewing.

The article to be stitched is held in proper position by a presser-foot having the usual bar j , movable vertically endwise in the main frame, its depressing-spring j' , and lifting-cam j^2 . Special presser-feet are secured on

the lower end of the bar j for different styles of sewing. The presser-foot j^3 , (shown in the main views and in Fig. 5) has a triangular opening, through which the needle passes. 70 Other forms of presser-feet will hereinafter be described.

The feeding device l is shown as consisting of three sets of parallel teeth working through three slots in the throat-plate m of the table 75 m' and carried by a bar l' , actuated by an eccentric e^3 on the driving-shaft, and controlled in its movement by the ordinary eccentric-stop l^2 at the front end of the machine, while its other end slides in the usual guides. The feed 80 operates in a fixed relation to the main frame, while the eccentric partakes of the endwise movement of the driving-shaft, and is accordingly elongated to an extent sufficient to accommodate this movement—that is to say, the 85 eccentric both rotates and moves endwise in the feeding device to actuate it. The throat-plate m is adapted to slide in grooves in the table, so as readily to admit of its insertion or removal or replacement by others of special 90 construction. Fig. 6 shows it as provided with a triangular opening m^2 , through which the needle passes, and with three parallel slits, through which the feed-teeth project, two of these slits being short and immediately behind the needle-opening, and the third and 95 longer one extending alongside the opening.

A bar n , extending forward from the sliding ing frame under the table, carries at its forward end a looper-stud or thread-guiding pin n' , located immediately below the table about the level of the top of the rotary hook in advance thereof—that is, on the side opposite from the driving-wheel—and projecting backward from the front side of the machine or that on which 105 the face-cam is located. The needle reciprocates in the space between the forward face of the rotary hook and the looper-stud, the free end of which points toward the feed-bar. This looper-stud or thread-guiding pin controls the loops formed by the rotary hook o and presents them properly to the needle when the latter and the stitch-forming devices are in the positions shown in Figs. 1 and 9—that is, in their retracted position or that nearest 115 the driving-wheel. The rotary hook o is mounted on the forward end of the elongated eccentric e^3 , formed on the driving-shaft E , and is provided with an annular or cylindrical thread-guiding flange or rim o' , the forward or operative edge of which is inclined or cam-shaped relatively to its plane of rotation on the side next the wheel, its greatest projection being just behind the point of the hook relatively to its direction of rotation, 125 just behind which point the cam suddenly inclines away from the needle to a point opposite the other end of the hook, whence it gradually widens to the point of greatest extension above mentioned. The relation of 130 the parts is such that the thread is taken from the needle just as it begins to rise by the hook

o, passing between the back of the hook and the flange, subjecting it to increasing friction or pressure during the rotation of the hook in forming the loop, which is then presented to the needle for its passage therethrough in making the next stitch, the drop-off part of the flange assisting in controlling the thread in properly presenting the loop to the point of the needle when the stitch is being formed, with the parts in the advanced position or that farthest from the driving-wheel. (See Figs. 2 and 8.)

The stitch produced by the mechanism organized, as shown in the main views of the drawings, is on the upper side of the goods of the zigzag form shown in Fig. 14, the needle piercing the goods on alternately-opposite sides of the normal or medial line of traverse of the needle relatively to the feed, the stitches on one side of said line being formed when the roller on the rocking lever *h* is in the high part of the cam or that farthest from its axis, while the opposite stitches are formed when the roller is in the opposite portion of the cam, the feeding of the goods taking place between each stitch when the needle is out of the cloth, as usual. Fig. 15 shows the reverse side of the stitch shown in Fig. 14 and the manner of interlocking the threads on that side. Fig. 16 shows the reverse side of this zigzag stitch with the looping and interlocking of the threads thrown to one side of the medial line by varying the tension on the thread.

A great variety of stitches may be produced on this machine by changing the gear-wheel *g'* and face-cam *g³*. If, for instance, a wheel be substituted having the proportions of three to one relatively to the driving-pinion *g* and carrying a cam *g⁵*, Fig. 10, adapted to move and hold the lever *h* in one of its positions for a third of its revolution and to move and hold the lever in the other position for two-thirds of its revolution, the stitch shown in Fig. 17 will be formed. The use of a wheel having the proportions of four to one in relation to the driving-pinion *g* and carrying a two-throw cam *g⁶*, Fig. 11, will produce the stitch shown in Fig. 18. By changing the form of the cam on this four-to-one wheel the needle may be caused to penetrate the goods, first, on one side of the medial line; secondly, on that line; thirdly, on the same line, and, fourthly, on the opposite side of that line, thence returning to the opposite extremity of its movement to repeat these steps, forming the stitch shown in Fig. 19. Another cam on the same wheel will produce the pattern shown in Fig. 20, the first stitch being on one side of the medial line, the second on the line, the third to the opposite side of the medial line, and the fourth on the line again.

It will readily be understood from the foregoing description that an endless variety of patterns and stitches may be produced by simply changing the number of teeth of the

pattern gear-wheel *g'* and the relations of the face-cam *g²* relatively to the driving-pinion *g*. It will also be seen that the form of each pattern can be changed by varying the range of movement of the sliding frame and its connected parts as well as by varying the feed of the goods.

The machine, as before stated, is also well adapted for overedge stitching, a sample of which is shown in Fig. 21, Fig. 22 representing the reverse side. A cord or cords of various colors and make may be run in this overedge stitch, so as to lie on the extreme edge of the goods or on either side thereof, thus producing varied and pleasing effects and adapting said stitch as a binding. In working this overedge stitch on this machine I prefer to use a presser-foot *k*, Fig. 12, with the needle-hole cut away at one edge. The gear-wheel *g'* and face-cam *g³* are used to produce the stitch shown in Figs. 21 and 22, the needle of the machine being thereby caused alternately to pierce the goods near one edge and to form a stitch outside of but near said edge, the inclined or cam flange *o'*, surrounding the hook *o*, assisting to form the stitch and throw the loopings under the edge, as shown in Fig. 22.

To adapt the machine to bind eyelet-holes, as in Fig. 23, a plate *q* is substituted for the plate *m*, ordinarily used. This plate *q* is provided with openings for the feed-teeth, and has a semi-cylindrical flange *q'* projecting upwardly from the plate at one side of the needle-opening. The goods *p²* are placed upon the table with this flange *p'* extending through the hole to be bound, said flange acting as a guide around which to turn the goods. This rotation is accomplished by that part of the feed-teeth lying alongside the needle, the goods being pressed thereon by a roller *r* on a stud projecting from a presser-foot *k'*, substituted for the one above described. When this guide and rotary presser-foot operate in combination with the two-throw cam *g³*, (shown in the main drawings,) the needle alternately pierces the goods set over the semi-cylindrical guide *q'* on one side of said guide, and then passes through the guide and the hole in the goods. As the goods are partly rotated each time the stitch is made by the feed *l* and the roller *r* of the presser-foot, the stitches are formed radially around the hole, as shown in Fig. 23.

It will be seen from the foregoing description that under my improved organization the driving-wheel, the driving-shaft, the rotary hook, the looper-stud or thread-guiding pin, and the needle, in addition to their usual movements, are all reciprocated transversely to the line of feed during the formation of the stitch by the action of the pattern-cam *g³* and its connections with the slide-frame, and that these traversing movements are always in the same vertical and horizontal planes, in contradistinction to prior machines, in

which some of these movements were curvilinear or around their pivots, instead of being rectilinear, and I am consequently enabled very much to simplify the organization.

5 Having thus fully described the construction, organization, and operation of my improved sewing-machine, what I claim therein as new and as of my own invention is—

1. The combination, substantially as hereinbefore set forth, of a main frame, a vertical U-shaped plate or frame, guide-bearings on the main frame in which the frame slides bodily endwise, a driving-shaft movable endwise in bearings in the main frame, a driving-pinion turning loosely on this shaft in fixed bearings on the main frame, a gear-wheel engaging therewith turning on a shaft mounted in fixed bearings on the main frame, a pattern-cam rotating on an axis coincident with that of the gear-wheel, a shaft rocking in fixed bearings on the main frame, an actuating-lever connecting this rock-shaft and the cam, a crank-arm on the rock-shaft, an adjusting-block movable in a slot in the sliding frame and similarly movable along the crank-arm, a bearing-arm pendent from the sliding frame, a grooved collar fixed on the driving-shaft and embraced by the bearing-arm, in which it freely turns, and a feather connecting the collar and driving-pinion, whereby the sliding frame and driving-shaft are both reciprocated bodily endwise in their bearings on the sliding frame and their range of movement may be coincidently varied.

35 2. The combination, substantially as hereinbefore set forth, of a main frame, a rigid plate or frame, guide-bearings on the main frame in which the plate slides bodily endwise, bearing-blocks on the sliding frame, a needle-bar movable vertically in said bearing-blocks, a guide-block on the needle-bar, a needle-arm vibratable on a pivot on the main frame, a slot in the free end of the needle-arm in which the guide-blocks slide, a driving-shaft movable endwise in bearings in the main frame, eccentrics on the driving-shaft and needle-arm, a connecting-rod uniting them, and means for reciprocating the sliding frame bodily endwise by the rotation of the driving-shaft, whereby the needle-bar is reciprocated both vertically and horizontally in rectilinear paths.

3. The combination, substantially as hereinbefore set forth, of a main frame, a rigid plate or frame, guide-bearings on the main frame in which the plate slides bodily endwise, a driving-shaft rotatable and movable bodily endwise in bearings in the main frame, a driving-wheel fixed on said shaft, a looper-hook fixed on said shaft, and means for reciprocating the shaft, driving-wheel, and hook bodily and all together and connecting said shaft and sliding frame.

4. The combination, substantially as hereinbefore set forth, of a main frame, a plate or frame, guide-bearings on the main frame in

which the plate slides bodily endwise, a driving-shaft rotatable and movable bodily endwise in bearings in the main frame, a driving-wheel fixed on said shaft, an elongated eccentric also on the shaft, a looper-hook carried by the shaft, feed mechanism mounted on the main frame and vibrating in fixed relation thereto transversely to and actuated by the elongated eccentric, and means for reciprocating the shaft, driving-wheel, eccentric, and hook bodily and all together and connecting the driving-shaft and the sliding frame.

5. The combination, substantially as hereinbefore set forth, of a main frame, a plate or frame, guide-bearings on the main frame in which the plate slides bodily endwise, a bar projecting from the frame underneath the table, a looper-stud or thread-guiding pin mounted on the bar parallel with the line of the feed, a driving-shaft movable endwise in bearings on the main frame, an eccentric on the looping end of said shaft, a looper-hook carried by the shaft, feed mechanism mounted on the main frame vibrating in a fixed relation thereto transversely to the eccentric by which it is actuated, and means for reciprocating the shaft, looper-hook, and looper-stud bodily and all together and connecting the driving-shaft and sliding frame.

6. The combination, substantially as hereinbefore set forth, of a main frame, a rigid plate or frame, guide-bearings on the main frame in which the plate slides, bearing-blocks on the sliding frame, a needle-bar movable endwise in said bearing-blocks, a needle carried by the needle-bar, a guide-block on the needle-bar, a needle-arm, a pivot on the main frame on which it vibrates, a slot in the free end of the needle-arm in which the guide-block of the needle-bar slides, a driving-shaft rotatable and movable endwise in its bearings, an eccentric on the shaft, a rod connecting it with the needle-arm, feed mechanism vibrating in a fixed relation to the frame transversely to the driving-shaft, a feed-actuating eccentric on the driving-shaft, a looping-hook carried thereby, a looper-stud or thread-guiding pin mounted on the sliding frame parallel with the plane of rotation of the looper-hook, between which and this pin the needle reciprocates, and means for reciprocating the driving-shaft, looping-hook, thread-guiding pin, and needle-bar bodily and all together and connecting the driving-shaft and sliding frame.

7. The combination, substantially as hereinbefore set forth, of a main frame, a rigid plate or frame, guide-bearings on the main frame in which the plate slides, a needle-bar and needle movable endwise in bearings in the slide-frame, a vibrating needle-arm having a sliding connection with the needle-bar, a driving-shaft rotatable and movable endwise in its bearings, an eccentric on the driving-shaft, a connecting-rod between this eccentric and the needle-arm, feed mechanism vi-

brating in a fixed relation to the main frame transversely to its actuating-eccentric on the driving-shaft, a looping-hook carried thereby, a driving-pinion through which the driving-shaft plays endwise, a pattern-cam driven therefrom, means for reciprocating the sliding frame, needle-bar, driving-shaft, and looping-hook bodily and all together interposed between the pattern-cam and sliding frame, and means for adjusting the throw of all these parts to vary the pattern of the stitching.

8. The combination, substantially as hereinbefore set forth, of a main frame, a sliding frame, a needle-bar carried thereby, means for reciprocating the needle-bar, a driving-shaft rotatable and movable endwise in its bearings, a looping-hook mounted thereon, a feeding device, a thread-guiding pin carried by the sliding frame, between which pin and hook the needle-bar reciprocates, a pattern-cam, and means for reciprocating the driving-shaft, sliding frame, and the parts carried thereby bodily transversely to the line of feed.

9. The combination, substantially as hereinbefore set forth, of a main frame, guide-bearings thereon, a frame sliding bodily endwise therein transversely to the line of feed, bearing-blocks on the sliding frame, a needle-bar movable endwise therein, a guide-block on the needle-bar traversing a slot in the sliding frame, a needle-arm vibrating on a pivot on the main frame, a guide-bearing in the free end of the needle-arm, and a block pivoted on the needle-bar traversing this slot to accommodate the lateral rectilinear movements of the needle-bar.

10. The combination, substantially as hereinbefore set forth, of feed mechanism, a needle reciprocating transversely thereto, a hook rotating in a plane parallel with the line of traverse of the feed mechanism, a thread-guiding pin between which and the hook the needle works, and means for giving the needle, hook, and pin concerted reciprocations transverse to the line of feed.

11. The combination, substantially as hereinbefore set forth, of feed mechanism, a needle reciprocating transversely thereto, a hook rotating in a plane parallel with the line of traverse of the feed mechanism, an annular flange on the face of the hook next the needle, the working edge or face of which flange gradually inclines from its normal height toward the needle, the highest part being just behind the point of the hook where the highest and lowest portions of the flange meet, whereby the loop is acted upon with a gradually-increasing tension and caused to be properly presented to the needle and suddenly released by falling off from the high part of the flange as the point of the hook enters the loop, and means for giving the needle and hook concerted reciprocations transverse to the line of feed.

12. The combination, substantially as hereinbefore set forth, of feed mechanism, a needle reciprocating both vertically and transversely thereto, a thread-guiding pin on one side of the path of the needle, a rotating hook on the opposite side of the path of the needle, an annular cam-flange on the face of the hook next the needle, between which flange and pin the loop is alternately guided during the formation of the stitch, and means for giving the needle, hook, and pin concerted reciprocations transverse to the line of feed.

13. The combination, substantially as hereinbefore set forth, of feed mechanism, a needle reciprocating both vertically and transversely relatively thereto, a thread-guiding pin, a looper-hook, its annular cam-flange, a table or throat-plate perforated for the passage of the feed-teeth and needle, a semi-cylindrical tubular pin projecting above the table on one side of the needle-hole, a presser acting on the feed-teeth at one side of this hole, and means for giving the needle, hook, and pin concerted reciprocations transverse to the line of feed.

14. The combination, substantially as hereinbefore set forth, of a main frame, a rigid plate or frame sliding bodily endwise in guide-bearings therein, a single continuous shaft rotatable and movable endwise in bearings in the main frame, a driving-wheel fixed on said shaft, actuating-eccentrics on the shaft, a driving-pinion turning loosely on this shaft in fixed bearings on the main frame, a gear-wheel meshing with this pinion and turning on a shaft mounted in fixed bearings on the main frame transversely to the driving-shaft, a pattern-cam driven by this gear-wheel, a rock-shaft rocking in fixed bearings on the main frame transversely to the driving-shaft, an actuating-lever connecting the rock-shaft and cam, a radial crank-arm on the rock-shaft sliding in a pivoted guide adjustable toward and from the rock-shaft in a guide in the sliding frame, a grooved collar or journal fast on the driving-shaft, a pendent arm on the slide-frame embracing this collar, and a feather connecting the collar and driving-pinion, whereby the throw or endwise movement both of the sliding frame and driving-shaft and the parts respectively connected therewith may coincidentally and correspondingly be adjusted.

15. The combination, substantially as hereinbefore set forth, of a main frame, a frame movable endwise therein, a needle-bar and needle carried by said sliding frame, a needle-arm vibrating on a pivot on the main frame, a driving-shaft movable endwise in said frame, a driving-wheel, a collar and eccentrics, and a looper-hook fixed on and movable with said shaft, a driving-pinion turning loosely on the shaft in fixed bearings on the main frame, a pattern-cam actuated thereby, a rock-shaft actuated by the pattern-cam, a crank-arm on the rock-shaft actuating the

slide-frame through an adjustable connection,
a bearing-arm on the slide-frame engaging
with the driving-collar, a feather-connection
between said collar and the driving-pinion,
5 feed mechanism and presser mechanism con-
nected with the main frame, a thread-guid-
ing pin carried by the sliding frame, and a
pitman connecting the driving-eccentric and
needle-arm.

Signed at Yonkers, Westchester county, 10
State of New York, this 22d day of Novem-
ber, 1887.

JAMES STEWART, JR.

Witnesses:

GEORGE W. BEACH,
H. L. GARRISON.