

No. 753,187.

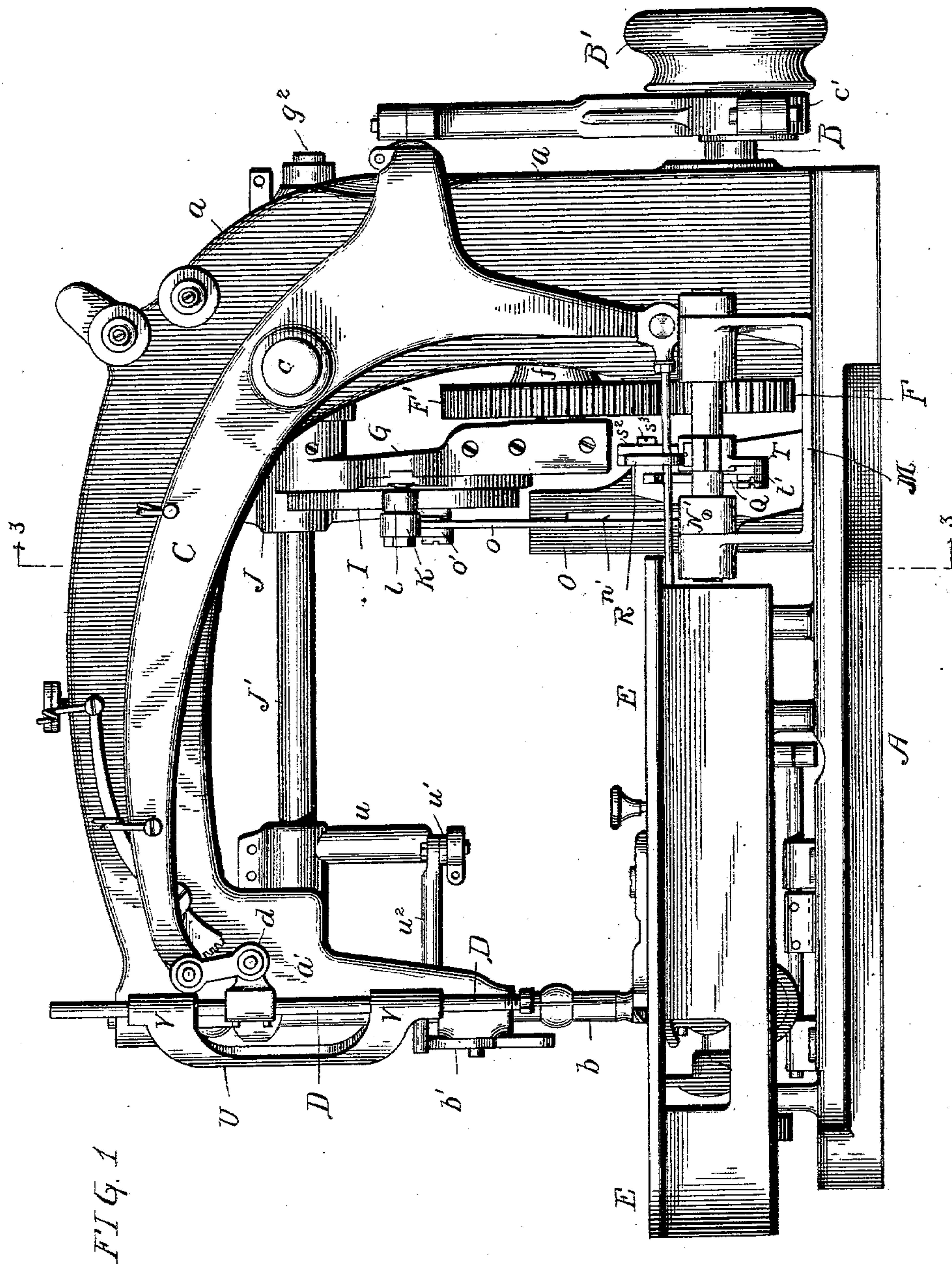
PATENTED FEB. 23, 1904.

R. G. WOODWARD.
SEWING MACHINE.

APPLICATION FILED JUNE 13, 1901.

NO MODEL.

7 SHEETS—SHEET 1.



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7 SHEETS—SHEET 2.

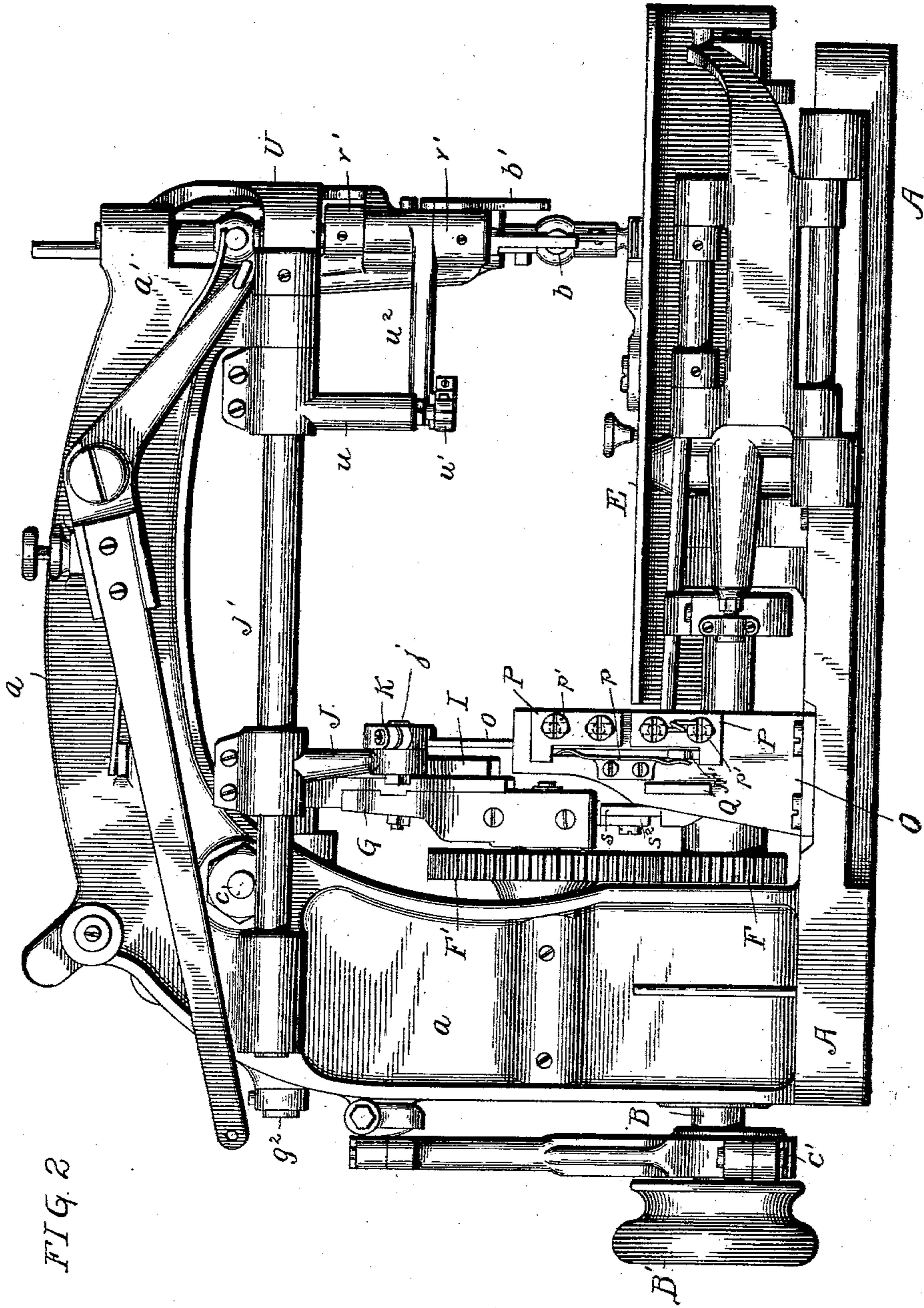


FIG. 2

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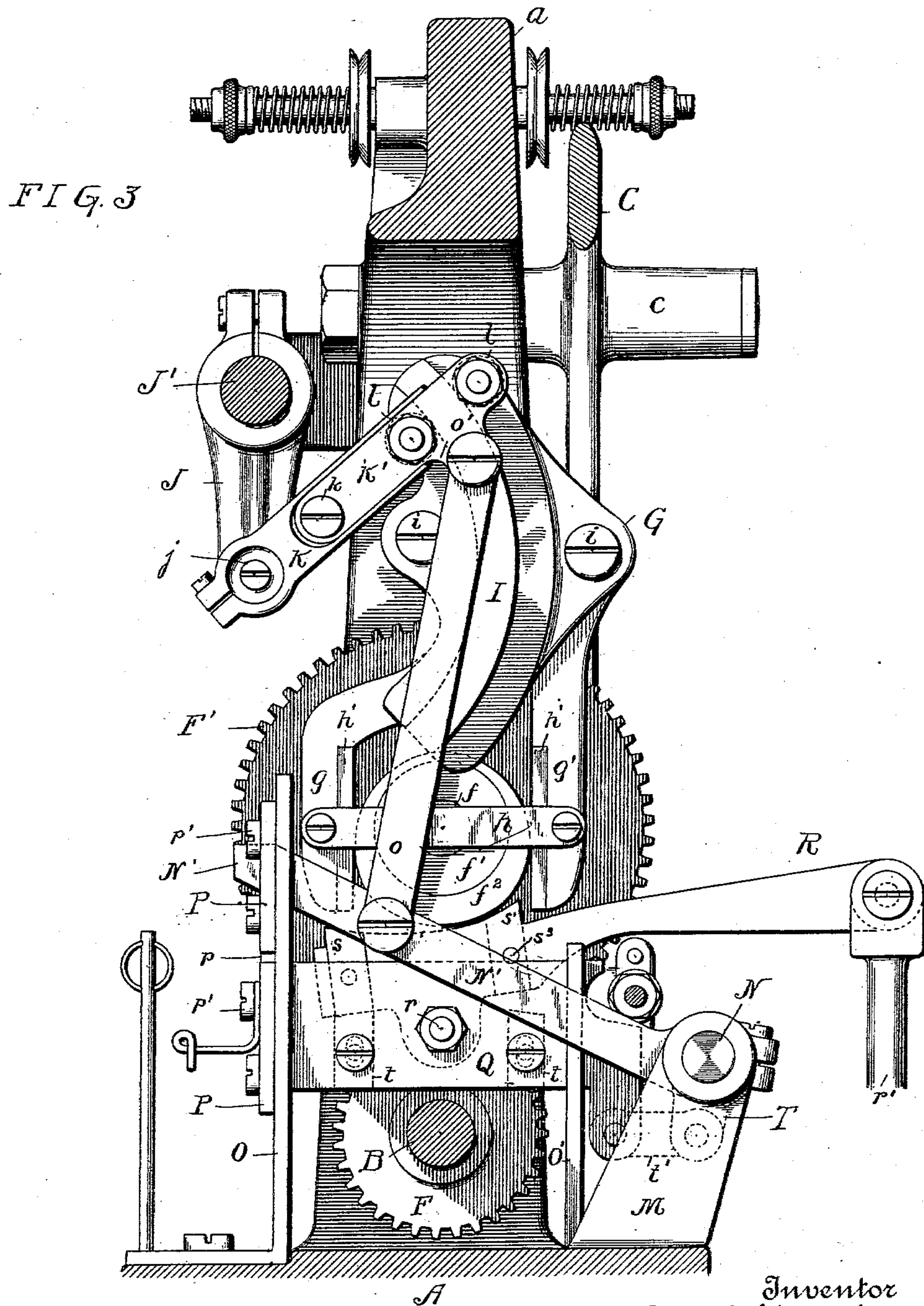
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7 SHEETS—SHEET 3.



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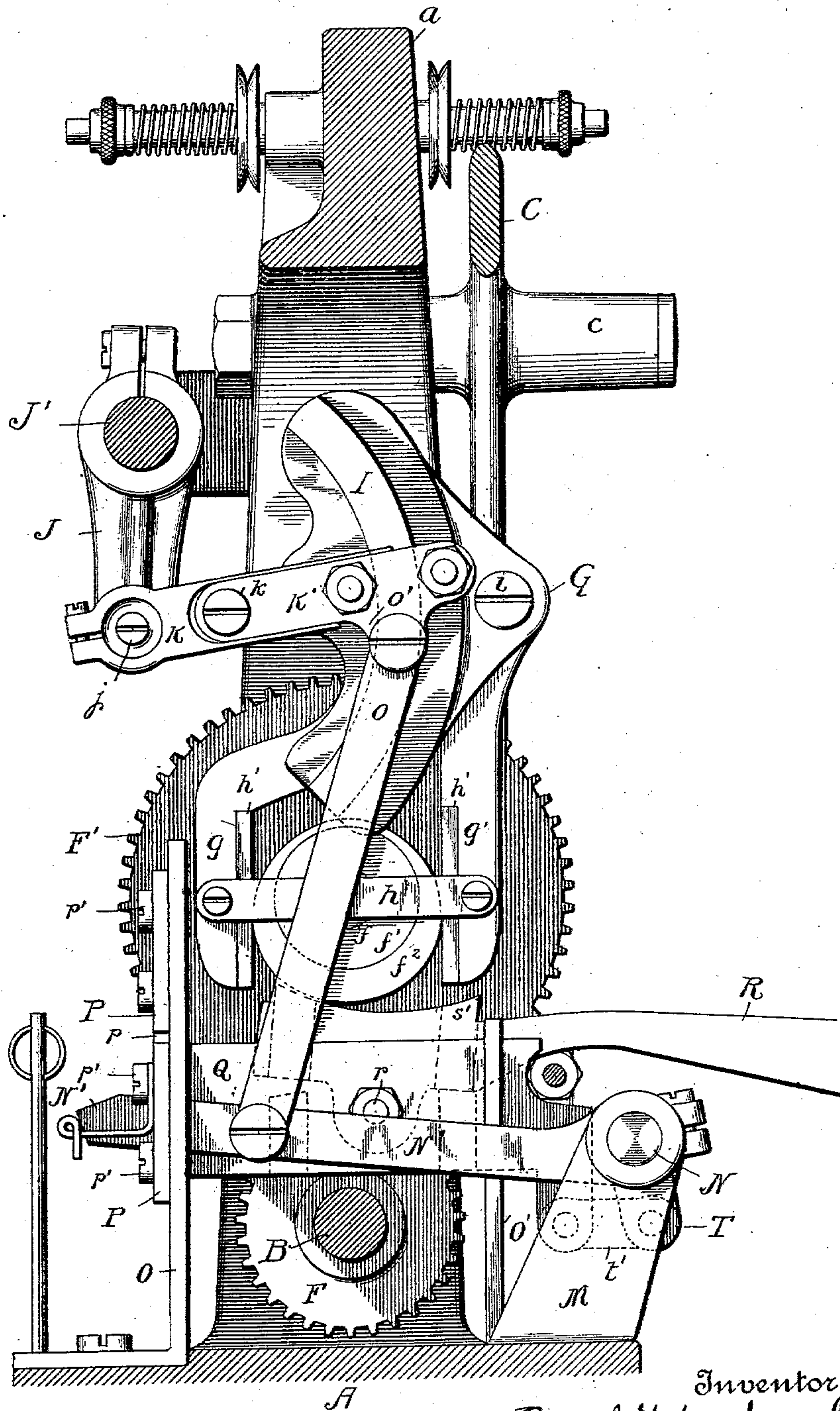
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7 SHEETS—SHEET 4.

FIG. 4



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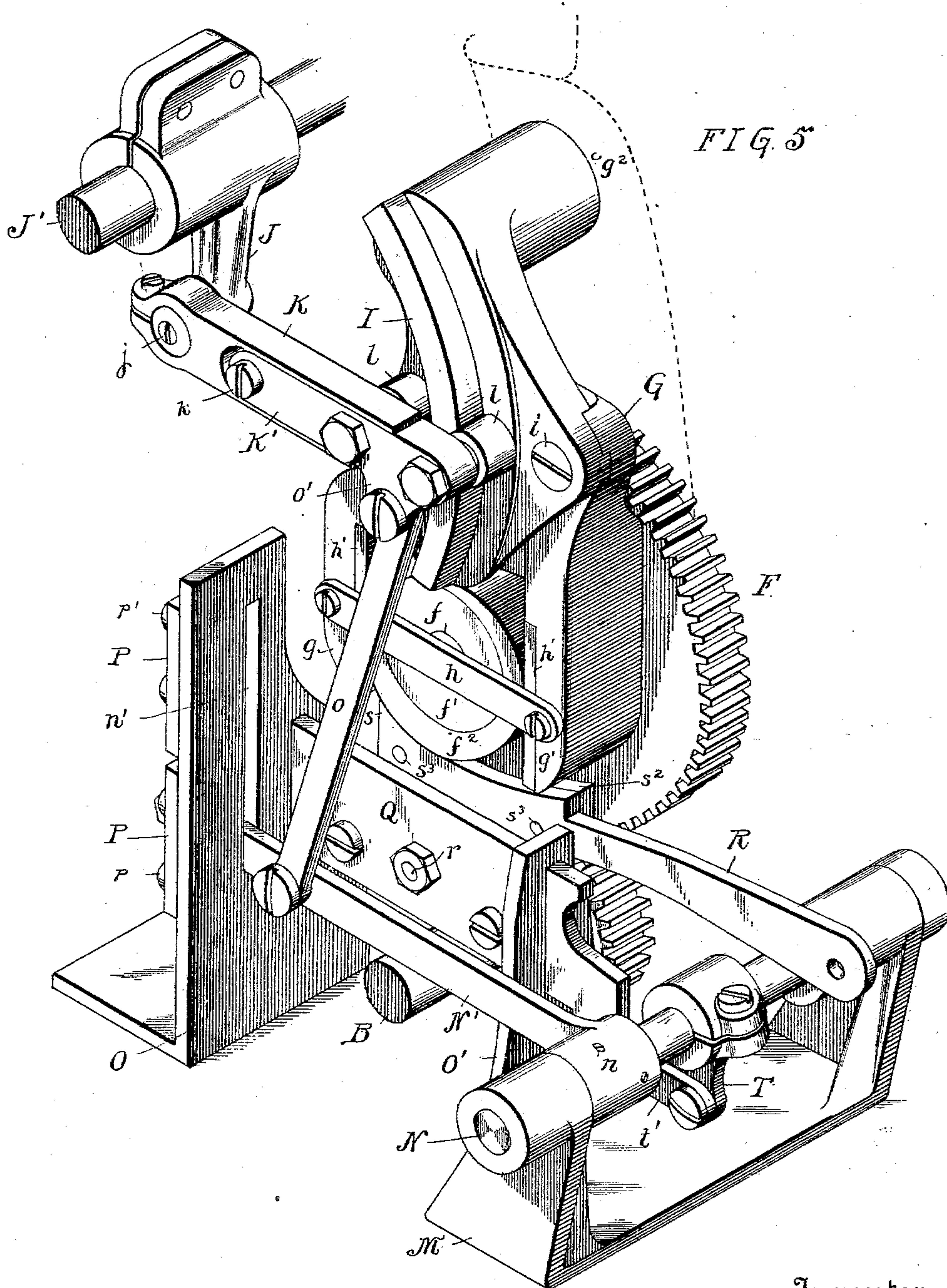
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7 SHEETS—SHEET 5.



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7 SHEETS—SHEET 7.

FIG. 9

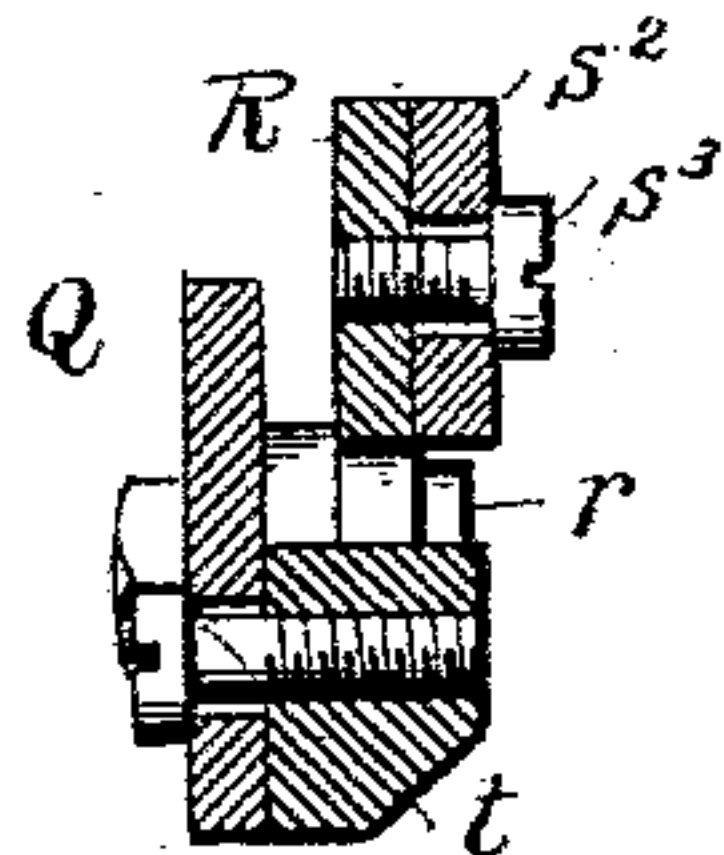


FIG. 8

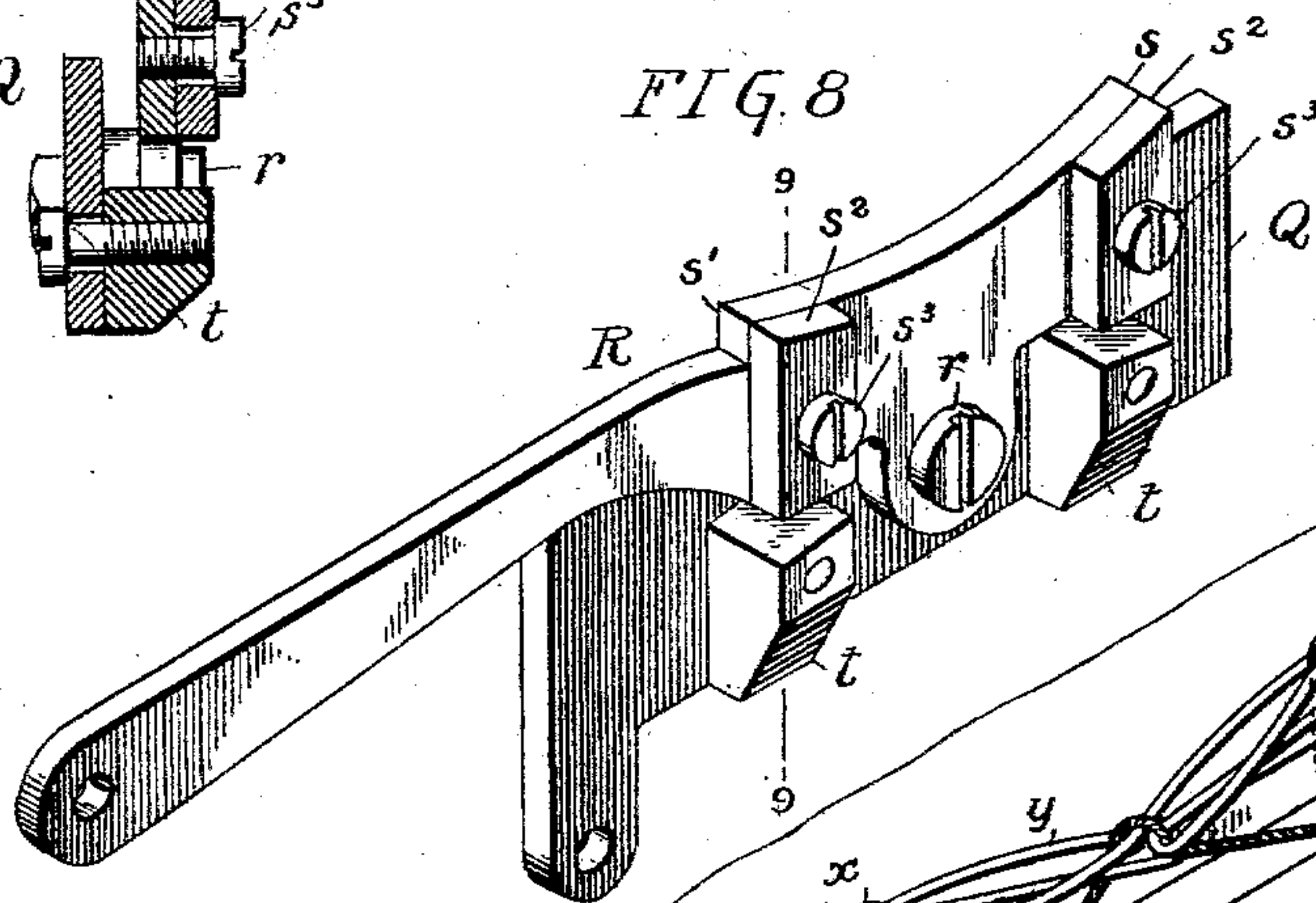
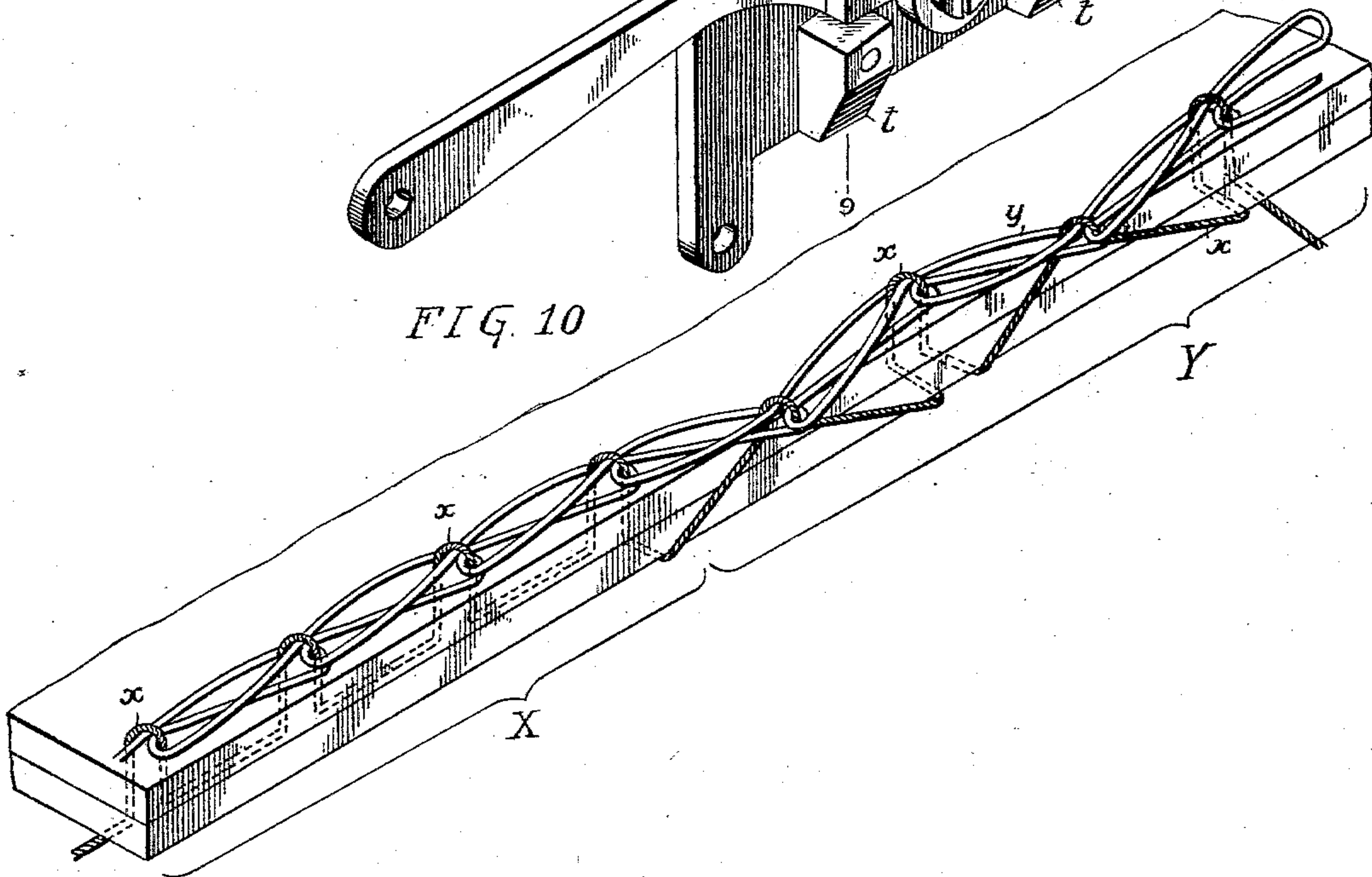


FIG. 10



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UNITED STATES PATENT OFFICE.

RUSSEL G. WOODWARD, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO UNION SPECIAL SEWING MACHINE CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,187, dated February 23, 1904.

Application filed June 13, 1901. Serial No. 64,396. (No model.)

To all whom it may concern:

Be it known that I, RUSSEL G. WOODWARD, a citizen of the United States, residing at Waukegan, in the county of Lake, State of Illinois, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to certain improvements in sewing-machines, and has for its principal object to construct a machine capable of forming both straightaway and zigzag or overedge stitches in which the character of stitch may be changed automatically.

A further object is to so construct and arrange the mechanism for changing the character of the stitch as to render it in great measure self-adjusting, so that any premature movement of that portion of the stitch-forming mechanism adjusted may be prevented, the movement at either change being so governed by the mechanism as to at all times produce a perfect stitch at the changing-point.

Further objects of the invention are to so construct the apparatus that the change of stitch may be made by the operator by a single movement, to provide for a positive operation of the parts, and for the adjustment of the various parts of the mechanism and the renewal of those portions subjected to the greatest wear.

The invention consists, primarily, of a sewing-machine adapted for both zigzag and straightaway sewing, with means whereby either form of stitch-forming mechanism may be thrown into and out of action without stopping or retarding the action of the stitch-forming mechanism.

Further, the invention consists in various combinations and arrangements of parts and matters, as hereinafter described and referred to in the appended claims.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of a sewing-machine constructed in accordance with my invention. Fig. 2 is a similar view of the opposite or rear side of the machine. Fig. 3 is

a transverse sectional elevation of the machine on a somewhat larger scale on the line 3 3, Fig. 1. Fig. 4 is a view similar to Fig. 3, showing the parts in different positions. Fig. 5 is a perspective view of the more essential portions of the mechanism. Fig. 6 is an end elevation of upper portion of the machine. Fig. 7 illustrates in perspective a somewhat modified structure of the parts shown in Fig. 5. Fig. 8 is a perspective view, and Fig. 9 a sectional view, of detached portions of the mechanism; and Fig. 10 is a perspective view illustrating the character of work which the machine is designed to accomplish.

In the drawings, A represents the base of the machine, from which rises an arm *a*, carrying at its head *a'* the presser-foot bar *b* and its lifter *b'*, and at its rear end carrying the main shaft B, on which is a belt-wheel B', the machine being of the well-known Union Special type and the parts just referred to, as well as the needle-lever C, journaled on the stud *c*, operated by the eccentric *c'* on the main shaft to give vertical reciprocating movement to the needle-bar D and the link connection *d* between the forward end of the needle-lever and the needle-bar stud, being all of a construction usual in Union Special machines.

E represents the cloth-plate, under which are the looper and feed mechanisms usually existent in machines of this type and all operated from the main shaft B in the usual manner.

On the shaft B is secured a pinion F, the teeth of which intermesh with those of a gear-wheel F', mounted so as to turn freely on a stud-shaft *f*, secured in the arm *a*. The outer end of the shaft is provided with an enlarged circular head *f'*, forming a guide and support for an eccentric or cam *f''*, secured to and rotating with the gear-wheel F'. The eccentric *f''* rotates between and in working contact with the two arms *g g'* of a frame G, hung on a pivot-stud *g''*, carried by the arm *a*, the movements of the eccentric being transmitted to said arms and effecting an oscillating movement thereof. The two arms are connected by a cross-bar *h*, and those portions of said arms with which the eccentric comes into con-

tact are provided with hardened plates h' , which may be renewed when worn.

To the frame G is secured by screws i a ribbed segment I, the center of which is at 5 times slightly eccentric to the center of a pivot-pin j , carried by the lower end of an arm J, depending from and rigidly secured to a rock-shaft J'.

K represents a two-part bar or link extending 10 from the pivot-pin j to a point beyond the ribbed segment and having a portion K', provided with two small antifriction-rollers l , situated one on each side of and in contact with the segment. The portion K' of the bar 15 is narrower than the portion K and is guided within a slot in the latter, so as to permit of the lengthening or shortening of said arm, the two parts being locked in any desired position to which they may be adjusted by a screw k .

M represents brackets fixed to the base of 20 the machine and supporting a short rock-shaft N, to which is secured by set-screws n a lever or arm N', the free end of which passes through a guiding-slot n' , formed in a standard O at 25 the opposite side of the machine, said arm N' being connected by a link o to an ear o' on the arm K. The arm N' is moved within the slot n' , with the rock-shaft N as a center, and at each extreme of movement is caught and 30 lightly held by a spring p , secured at its center to the standard and having its free ends slightly bent, so as to engage and press with some little force against the side of the arm. The upper and lower limits of movement of 35 the arm N' are governed by adjustable stops P, secured to the standard O by screws p' passing through vertically-elongated openings in the stops P.

Guided in an opening in the standard O and 40 in a similar opening in a standard O' is a slide Q, provided at about its center with a pivot-pin r , on which is fulcrumed a lever R, the movement of which effects the subsequent adjustment of the machine for the formation of 45 the stitch desired. The outer end of said lever R is connected by a suitable rod r' or otherwise to a pedal-lever (not shown) within convenient reach of the operator, the pedal when depressed moving the lever from the position 50 shown in Fig. 3 to that shown in Fig. 4, but normally being held up by a suitable spring, so that the lever is maintained in the position shown in Fig. 3, this being the position of the parts when the machine is forming a straight- 55 away stitch.

The upper face of the lever R is curved, as shown, and such curved face is always partly under the eccentric and partly under one or 60 other of the arms g g' , but at all times out of contact therewith. The curved faces terminate in abrupt vertical shoulders s s' , which may be moved into the path of travel of the arms g g' by the movement of lever R on its 65 pivot, the wearing-faces of the shoulders being in the form of hardened metallic blocks

s^2 , provided with slotted openings for the passage of securing-screws s^3 to permit of their adjustment or for renewal when worn. The limits of movement of the operating-lever are 70 governed by stop-blocks t , adjustably secured to the slide Q, so that they may be moved vertically, if it be desired to alter the throw of the lever. The end of the slide Q is connected by a link t' to an arm T, secured to the shaft 75 N, any movement of the slide being thus transmitted to the shaft and through the latter to the link K through the arm N' and the connecting-link o .

The rock-shaft J', previously referred to, is 80 mounted in suitable bearings on the arm a , and near its forward end is connected by an arm u and link u' to an arm u^2 , secured to or formed integral with a needle-bar-guiding frame U, the latter being pivoted at v to lugs 85 v' at the rear of the head a' and extending around to the front of the frame, at which point it is provided with suitable guides V for the reception of the needle-bar D.

The operation of the machine is as follows: 90 When the various portions of the mechanism assume the position shown in Fig. 3, the rotation of the eccentric f^2 will oscillate the frame G and segment I; but as the link K has its central line coincident with the center of the pivot-point of the frame G no movement of 95 the rock-shaft J' will result, and the needle-bar-guiding frame will remain in a stationary position, the machine forming a straight row of stitches, as shown at X, Fig. 10. When it is desired to change the stitch to zigzag or 100 overedge, the operator depresses the operating-lever R to the position shown in Figs. 4 and 5, the immediate result of which is to bring the shoulder s into line with the lower end of arm g , the latter coming into contact 105 with said shoulder and forcing the lever R and its carrying-slide Q toward the front of the machine. This movement is transmitted by the link t' , arm T, rock-shaft N, arm N', and link o to the link K, drawing the latter down to the 110 position shown in Fig. 4, its rollers l bearing on either side of the segment. As the segment continues to oscillate its movements are now transmitted through link K, rock-shaft J', 115 and the intervening mechanism to the needle-bar-carrying frame U, giving to the latter an oscillating or lateral movement across the path of the direct line of stitches, so that alternate stitches will be formed in the fabric and at the edges thereof, as shown at Y in Fig. 10. 120 The various movements are so timed that the needle-bar will be held at one reciprocation in line with the edge of the fabric and at the next in line with the straight stitches. When it is desired to reassume straight stitching, the operator removes his foot from the pedal and 125 the lever R reassumes the position shown in Fig. 3, the arm g' of the frame G coming then into contact with the shoulder s' and causing a movement of the lever R and the slide Q, 130

to which it is attached, in the direction of the standard O. This movement results in the rocking of the shaft N through the link *t'* and arm T and raises the link *o* and link K to the position shown in Fig. 3, the outer end of said link K being moved over the center of the pivot-point of the frame G, so that no movement of the rock-shaft J' will result from any oscillation of the frame, and the needle-bar will be held in position for the formation of straightaway stitches. The various movements of the machine are so timed that the arms or jaws of the frame G cannot actuate the slide Q and so move the link K to operative or inoperative position until the needle is above the goods being stitched.

Referring now to Fig. 10, the needle-thread *x* is shaded and the looper-thread *y* is in outline for the sake of clearness, the stitch formed being of the usual character when the loops are formed in a continuous line, as at X, and arranged for the overedge effect, as shown at Y, alternate stitches continuing in the same line as the straight-away stitches and the intermediate loops being formed close to the edges of the leather or fabric, so that when the two layers are opened the edges at the portion Y will abut and form a smooth surface.

In the modified construction illustrated in Fig. 7 the construction of the link K³ is somewhat more simple than that shown in Fig. 5, and the standard O³ is also of less complicated construction. A single antifriction-roller *l'* is here employed, and the segment I, on which it travels, has the ribs I', between which the roller I travels.

The machine described is useful for a variety of purposes and may be employed on any work in which it may be desired to change the character of the stitch, as herein set forth. It is found of special value in sewing together the counter and quarter-sections of shoes where the counter edges may be connected by a straight, but the quarter-sections being arranged to abut must be united by a cross or overedge stitch.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a sewing-machine, suitable stitch-forming mechanism and means for vibrating the needle laterally across the line of the seam, said means including a vibrating member, and a link, automatic mechanism for shifting the connection between the vibrating member and the link, and means under the control of the operator for throwing said automatic mechanism into action; substantially as described.

2. In a sewing-machine, suitable stitch-forming mechanism and means for vibrating the needle laterally across the line of the seam, said means including a vibrating member, and a link, automatic mechanism for shifting the

connection between the vibrating member and the link, and means under the control of the operator for throwing said automatic mechanism into action, said parts being so timed that the shift can only take place while the needle is above the material being sewed; substantially as described.

3. In a sewing-machine, suitable stitch-forming mechanism, a needle, means for reciprocating it vertically, means for vibrating it laterally, automatic mechanism operated by the movement of the machine itself for throwing the needle-vibrating means into and out of action, and means under the control of the operator for throwing said automatic mechanism into action; substantially as described.

4. In a sewing-machine, suitable stitch-forming mechanism and means for vibrating the needle laterally across the line of the seam, said means including a rock-shaft with connections between it and the needle-bar, a link connected to the opposite end of the rock-shaft, a vibrating member to which the link is connected, and automatic means for shifting the connection between the link and the vibrating member, and means under the control of the operator for throwing said automatic mechanism into action; substantially as described.

5. A sewing-machine having stitch-forming mechanism and operating devices therefor, said stitch-forming mechanism including a needle-bar, a movable guide carrying said needle-bar, mechanism for holding said guide in fixed position, and mechanism for vibrating said guide, automatic means operable by the movement of the machine for throwing into and out of operation the vibrating mechanism, and means under the control of the operator for throwing said automatic mechanism into and out of action.

6. In a sewing-machine for forming straight-away and zigzag stitches, the combination of the needle-bar and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted segment, means for oscillating the same, a pivoted link adjustable on said segment, mechanism connecting said pivoted link to the needle-bar, and mechanism controlled by the operator for effecting the automatic adjustment of the link on said segment; substantially as described.

7. In a sewing-machine for forming straight-away and zigzag stitches, the combination of the needle-bar and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted segment, means for oscillating the same, a pivoted link connected indirectly to the needle-bar and adjustable on said segment, and means under the control of the operator for automatically effecting such adjustment; substantially as described.

8. In a sewing-machine for forming straight-away and zigzag stitches, the combination of the needle-bar and its operating mechanism,

of means for laterally vibrating said needle-bar, comprising a pivoted frame, means for oscillating the same, mechanism for transmitting the movements of said frame to the needle-bar, a controlling-lever adapted to be moved by the operator and movable into and out of the path of the oscillating frame, and mechanism connecting the controlling-lever to the needle-bar-operating mechanism; substantially as described.

9. In a sewing-machine for forming straightaway or zigzag stitches, the combination of the needle-bar and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted frame, means for oscillating the same, a segment carried by said frame, a link adjustable on said segment and connected indirectly to the needle-bar, a controlling-lever adapted to be moved by the operator and movable into and out of the path of the oscillating frame, and mechanism connecting the controlling-lever to said link for effecting its adjustment on said segment; substantially as described.

10. In a sewing-machine for forming straightaway or zigzag stitches, the combination of the needle-bar and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted frame having arms or jaws, a segment carried by the frame, a link adjustable on the segment, mechanism connecting the link and needle-bar, means for oscillating the pivoted frame, a controlling-lever having contact-shoulders movable into and out of the path of movement of the frame arms or jaws, and mechanism connecting said controlling-lever to said link for effecting the adjustment of the latter on said segment; substantially as described.

11. In a sewing-machine for forming straightaway or zigzag stitches, the combination of the needle-bar and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted frame having twin arms or jaws, a segment carried by the frame, a link adjustable on the segment and connected to the needle-bar, means for oscillating the pivoted frame, a controlling-lever having contact-shoulders movable into and out of the path of movement of the frame arms or jaws, a slide carrying said operating-lever and movable therewith, and mechanism connecting the slide to the said link for effecting the adjustment of the latter on said segment; substantially as described.

12. In a sewing-machine for forming straightaway or zigzag stitches, the combination of the needle-bar and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted frame having twin arms or jaws, a segment carried by the frame, a link adjustable on the segment and connected to the needle-bar, a rotatable eccentric or cam operating between the twin arms to effect the oscillation of the frame and

segment, a controlling-lever having contact-shoulders movable into and out of the path of movement of the arms or jaws, a slide carrying said lever and movable therewith, and mechanism connecting said slide to the said link for effecting the adjustment of the latter on the segment; substantially as described.

13. In a sewing-machine for forming straightaway or zigzag stitches, the combination of the needle-bar and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted frame having twin arms or jaws, a segment carried by the frame, a link adjustable on said segment and connected to the needle-bar, an eccentric or cam operating between the arms or jaws, a slide, guides therefor, a rock-shaft, an arm thereon connected to the slide, a rocking lever carried by the shaft and connected to the said link, a controlling-lever pivoted to the slide, there being on said controlling-lever shoulders adapted to be operated on by the twin arms or jaws; substantially as described.

14. The combination in a sewing-machine having a needle-bar and mechanism for laterally moving the same, of a controlling-lever for governing the operation of such mechanism, means for connecting the controlling-lever to such mechanism, a rock-shaft, a rocking lever secured thereto and indirectly connected to and movable by the controlling-lever, a frame having a guiding-slot for the end of said rocking lever, and a spring in contact with said rocking lever and adapted to hold the same at its two extremes of movement; substantially as described.

15. The combination in a sewing-machine having a needle-bar, and mechanism for laterally moving the same, of a controlling-lever for governing the operation of such mechanism, means for connecting the controlling-lever to such mechanism, a rock-shaft, a rocking lever secured thereto and indirectly connected to and movable with the controlling-lever, a frame having a guiding-slot for the end of said rocking lever and adjustable stops carried by said frame for limiting the extremes of movement of said rocking lever; substantially as described.

16. The combination in a sewing-machine, for the formation of straightaway or zigzag stitches, of the needle-bar, and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted segment, a link connected to the needle-bar, and adjustable on said segment, rollers carried by said link and situated one on either side of the segment, and means for oscillating said segment; substantially as described.

17. The combination in a sewing-machine for the formation of straightaway and zigzag stitches, of the needle-bar, and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted segment, a two-part link connected to the needle-bar

and adjustable on said segment, said segment being adjustable as to length, rollers carried by said link and situated one on either side of said segment, and means for oscillating said segment; substantially as described.

18. The combination in a sewing-machine for the formation of straightaway or zigzag stitches, of the needle-bar, and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted frame having twin arms or jaws, a segment carried by said frame, a link adjustable on said segment and connected to the needle-bar, means for oscillating said frame, a controlling-lever adapted to be moved by the operator, a slide carrying said lever, adjustable contact-shoulders carried by said lever for engagement with the twin arms or jaws, and mechanism connecting said slide to said link for effecting the adjustment of the latter on the segment; substantially as described.

19. The combination in a sewing-machine for the formation of straightaway or zigzag stitches, of the needle-bar, and its operating mechanism, of means for laterally vibrating said needle-bar, comprising a pivoted frame having twin arms or jaws, a segment carried by said frame, a link adjustable on the segment and connected to the needle-bar, means for oscillating said frame, a controlling-lever adapted to be moved by the operator, a slide to which said controlling-lever is pivoted, adjustable stops carried by the slide for limiting the movement of said lever, and mechanism

connecting said slide to said link for effecting the adjustment of the latter on the segment; substantially as described.

20. In a sewing-machine, comprising a vertically-reciprocating needle-bar, with means for holding it in position to move merely vertically, with means also for imparting to it a lateral vibration, automatic mechanism operable by the movement of the machine for throwing into and out of operation the vibrating means, and means under the control of the operator for throwing into and out of action said automatic mechanism; substantially as described.

21. In a sewing-machine, comprising a vertically-moving needle-bar, means for imparting lateral reciprocation to said needle-bar, means under the control of the operator for automatically throwing into and out of operation said mechanism for laterally reciprocating said needle-bar, including a pivoted segment, connections between said pivoted segment and the needle-bar, and means under the control of the operator for varying the point of application of said connections with the pivoted segment, whereby lateral movement may or may not be imparted to the needle-bar; substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

RUSSEL G. WOODWARD.

Witnesses:

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A. L. JAHN.