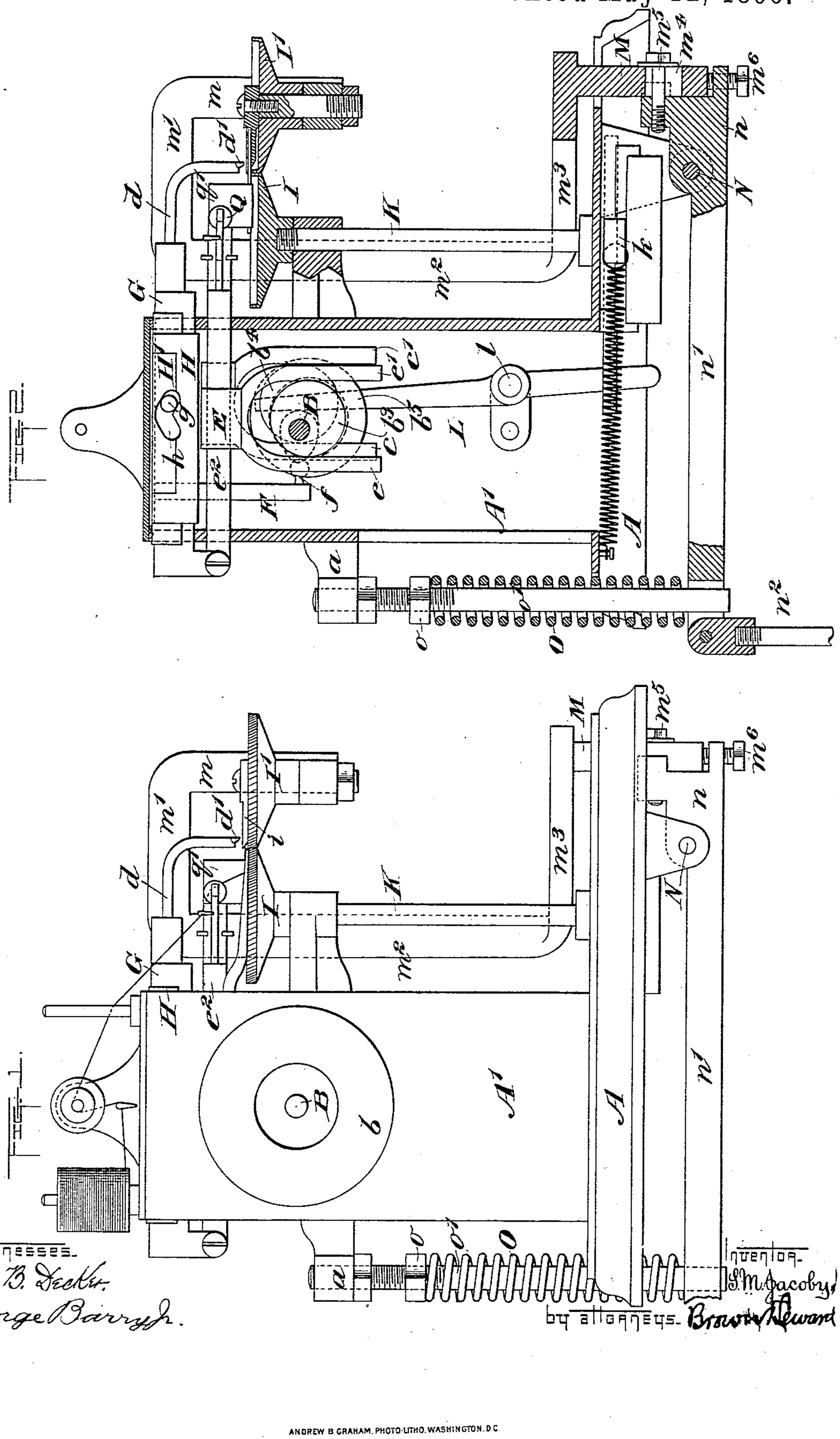
(No Model.)

3 Sheets—Sheet 1.

S. M. JACOBY.

SEWING MACHINE.

No. 559,978. Patented May 12, 1896.



ANDREW B. GRAHAM, PHOTO-LITHO. WASHINGTON, D. C.

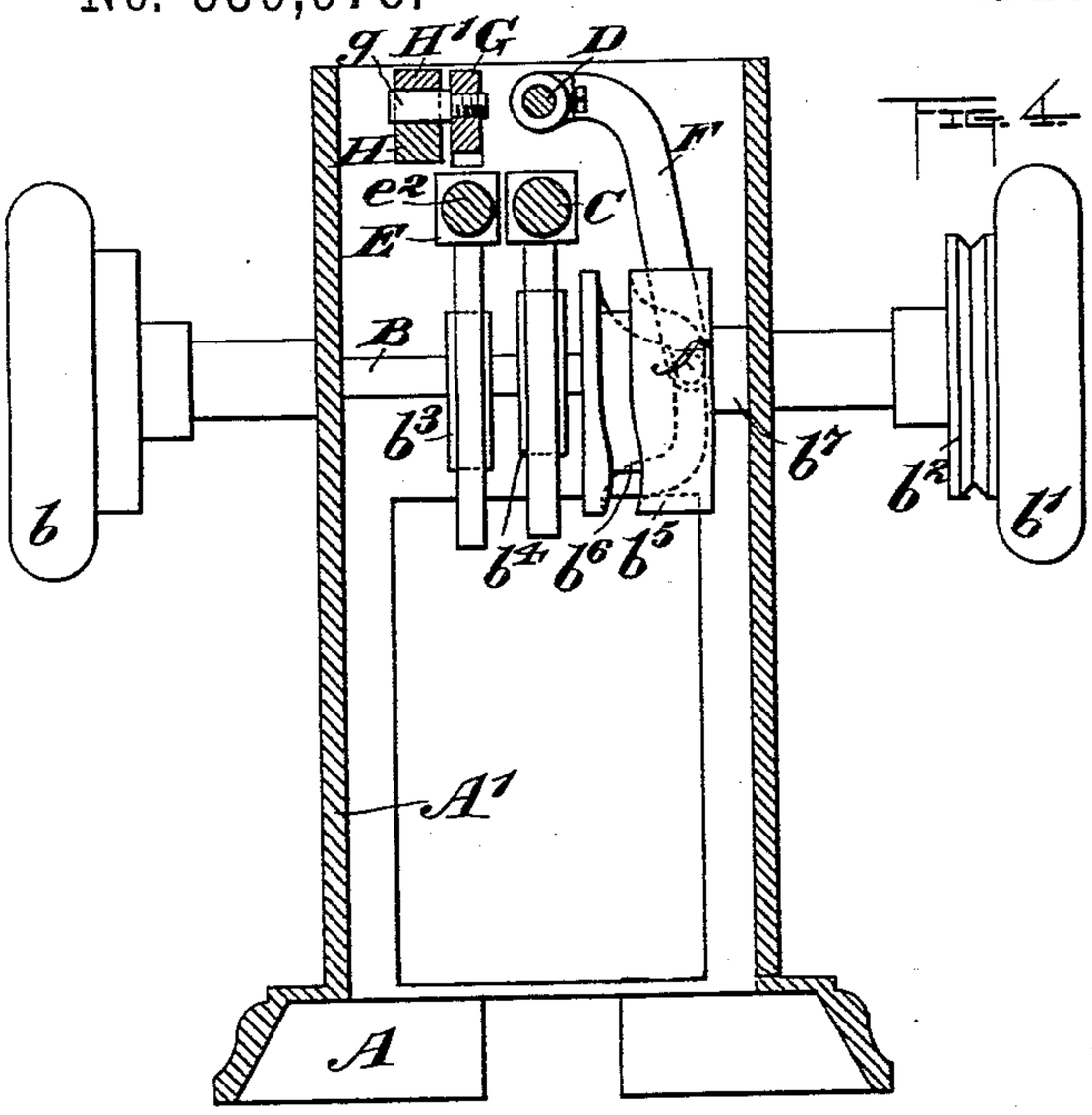
(No Model.)

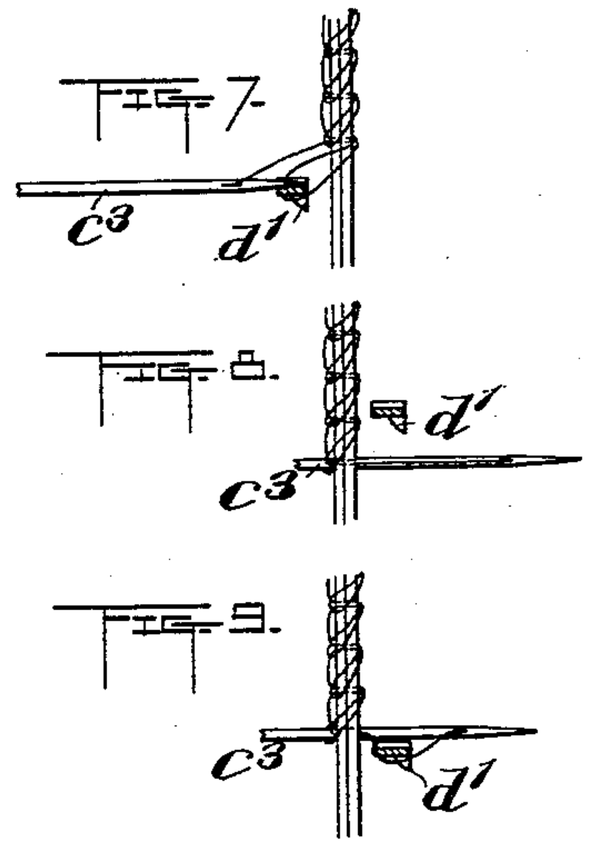
3 Sheets—Sheet 2.

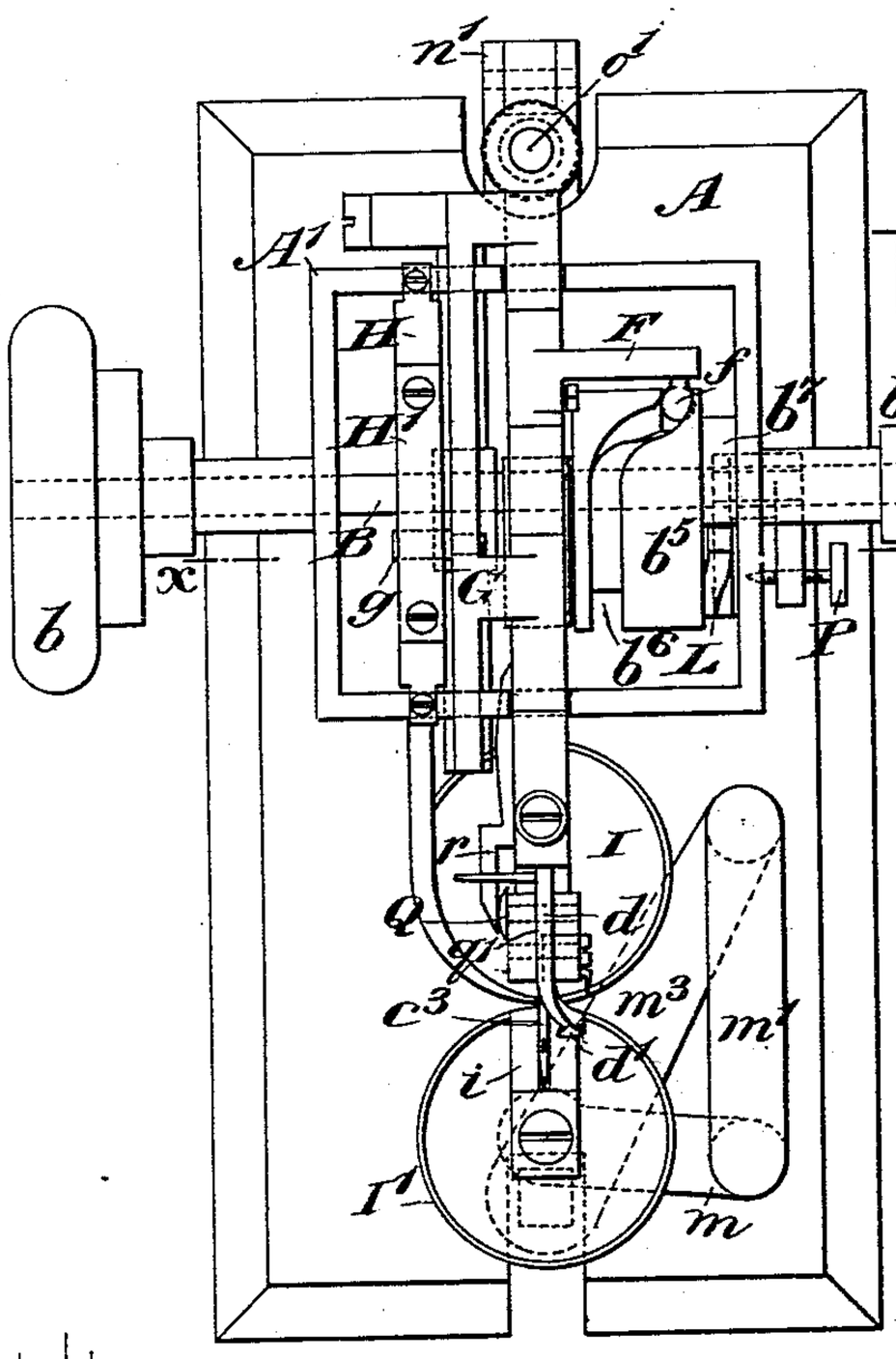
S. M. JACOBY.

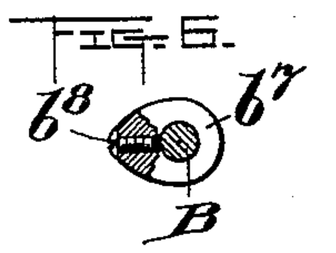
SEWING MACHINE.

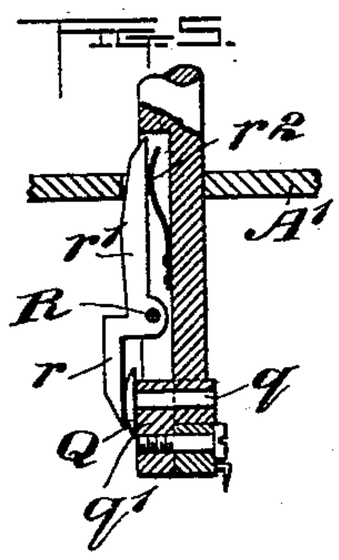
No. 559,978. Patented May 12, 1896.











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(No Model.) 3 Sheets—Sheet 3.

S. M. JACOBY.

SEWING MACHINE.

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Fig. 10.

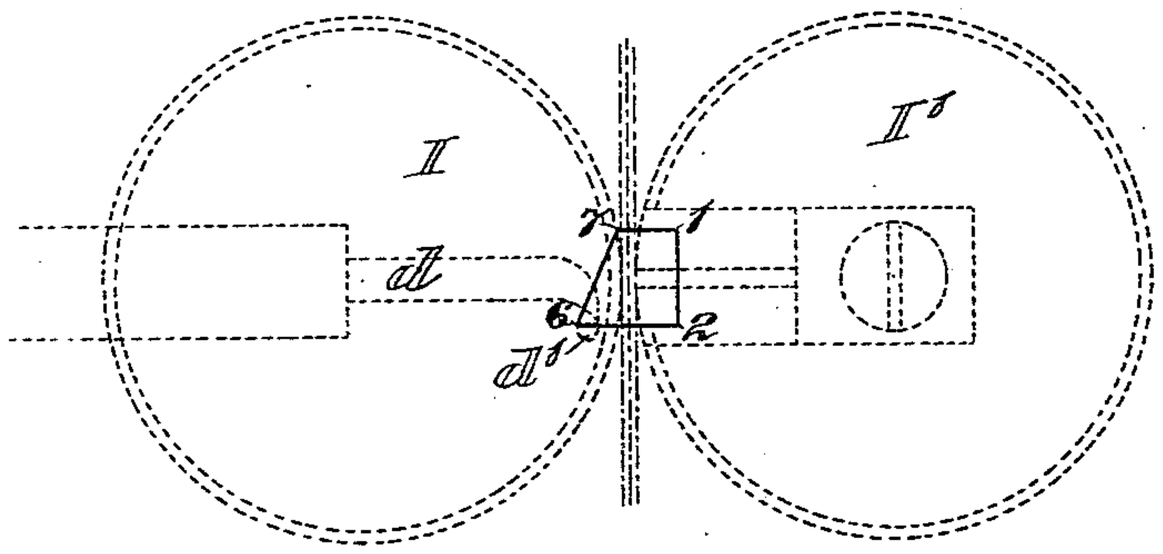
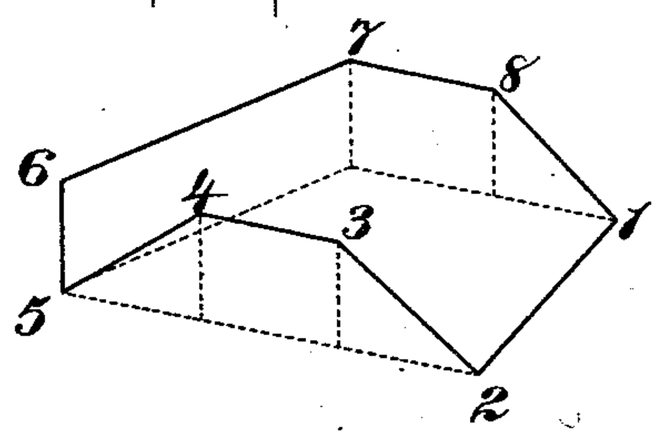


Fig. 11.



Witnesses.
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George Barry Jr.

Inventor.
Sellmar M. Jacoby.
by attorneys.
Brown & Seward

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UNITED STATES PATENT OFFICE.

SELLMAR M. JACOBY, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 559,978, dated May 12, 1896.

Application filed September 11, 1895. Serial No. 562,221. (No model.)

To all whom it may concern:

Be it known that I, SELLMAR M. JACOBY, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification.

My invention relates to an improvement in sewing-machines, and more particularly to that type of machine which is adapted for sewing together pieces of fur.

My present invention is directed to an improvement in the motion in the looper-hook relatively to the reciprocating needle, by means of which the machine is capable of running at a very high speed without dropping stitches, breaking thread, or great wear and tear.

In the accompanying drawings, Figure 1 is a view of the machine in side elevation. Fig. 2 is a view in vertical section from front to rear. Fig. 3 is a top plan view. Fig. 4 is a transverse vertical section along line $x\ x$ of Fig. 3. Fig. 5 is an enlarged view in detail, partly in section and partly in plan, of the device for holding the thread against rendering at the moment of the formation of the loop. Fig. 6 is a view in detail of the cam and its adjustment for temporarily increasing the length of stitch beyond the usual limit. Figs. 7, 8, and 9 are plan views in detail, showing the formation of the stitch at three different stages, the parts of the thread which form the stitch being shown an exaggerated distance apart to more clearly follow its formation. Fig. 10 is a top plan view of the indicated path of the point of the looper-hook, the parts of the machine in proximity thereto being shown in dotted lines; and Fig. 11 represents in perspective the general direction of the path of the point of the looper-hook in space, it being understood that the actual path of the looper-hook is more or less curved, but corresponding to the general directions of the lines shown.

The bed of the machine is denoted by A, and this is surmounted by a casing A′ of generally oblong form for the purpose of supporting and housing certain of the moving parts. The main drive-shaft is denoted by B and is mounted in suitable bearings in the opposite sides of the casing A′, its opposite ends being provided with hand-wheels $b\ b'$, which also serve as balance-wheels, and one of its ends being further provided with a drive-pulley b^2 for receiving a band from a suitable source of power. (Not shown.) The shaft B carries three cams, (denoted, respectively, by b^3, b^4, and b^5,) all preferably housed within the casing A. The cams b^3 and b^5 are utilized to impart to the looper-hook, respectively, a longitudinally-reciprocating movement and a rocking movement, while the cam b^4 is utilized to impart to the needle its horizontally-reciprocating movement.

The needle-carrying bar is denoted by C, and it has fixed thereon a depending bifurcated yoke or hanger, the branches of which are denoted by $c\ c'$ and are so arranged as to embrace the opposite sides of the needle-operating cam b^4. The bar C, which carries the needle, is mounted in suitable bearings in the casing A′. The needle is denoted by c^3. The bar which carries the looper-hook is denoted by D and is located in the present instance above the bar C, suitably supported to permit of simultaneously receiving a rocking motion on its own axis, a longitudinal movement, and a reciprocating movement bodily in a direction transverse to its longitudinal axis.

The longitudinally-reciprocating movement of the bar D is imparted to it by means of a yoke or hanger E, provided with branches $e\ e'$, which embrace the opposite sides of the cam b^3, the yoke or hanger E being itself fixed to a bar e^2, in turn fixed to move with the looper-hook bar D. The rocking movement is imparted to the looper-hook bar D by means of a depending arm F, which carries at its lower end a laterally-projecting pin or antifriction-roller f, adapted to follow the groove b^6 in the face of the cam b^5. The bodily movement of the bar D in a direction transverse to its longitudinal axis—in the present instance a reciprocating vertical movement—is imparted to it by means of a laterally-projecting pin g, set in a bar G, fixed to move bodily with the looper-hook bar D, the said pin g being guided by an open V-shaped slot h in a plate or bar fixed to the upper portion of the casing A′. I prefer to form the open V-shaped slot above referred to partly in a plate H and partly in a plate H′, removably secured to the plate H by any suitable fastening device—such, for

example, as screws—and to removably secure the plate H to the casing by any suitable fastening device—such, for example, as screws—so that the plates H H′ may be either one or both of them renewed from time to time as the walls of the slot *h* become worn. The looper-hook has its shank *d* fixed in the bar D and bends downwardly toward the path of the needle c^3, terminating at its lower end in a transverse tapered toe or point of the hook, (denoted by *d*′.)

The material to be sewed is fed between the adjacent edges of a pair of feed-disks (denoted, respectively, by I and I′) located with their upper faces in proximity to the path in which the needle c^3 reciprocates. The disk I is fixed to a spindle K, which is rotated by means of a clutch mechanism commonly known in the art as a "Howe" clutch, located in the present instance at the foot of the spindle K—as, for example, at *k*—and operated by the vibrating lever L, fulcrumed at *l* and operated by a fourth cam b^7 on the main driveshaft B. The companion feed-disk I′ is free to rotate by the friction imparted to it, through the material being operated upon, from the positively-driven feed-disk I. It is mounted in the depending nut *m* of a support which somewhat resembles the letter "C," a part *m*′ extending from the depending nut *m* toward the front of the casing A′, and thence extending, as shown at m^2, down to a point in proximity to the bed-frame A, thence extending forwardly, as shown at m^3, to a point near the front of the bed-frame A, and being formed at this point integral with or rigidly connected to a depending standard M, provided with a vertically-elongated slot m^4, through which a clamping-screw m^5 extends into the short arm *n* of a vibrating lever pivoted beneath the bed-frame A at N. The support for the feed-disk I′ may be vertically adjusted to determine the position of the disk I′ relatively to the disk I by loosening the screw m^5 and turning on the adjusting-screw m^6, which engages the nut *n* of the lever and bears against the lower end of the standard M, and finally clamping the standard M to the lever by again screwing home the adjusting-screw m^5.

The long arm *n*′ of the lever on which the disk I is supported is connected by a rod n^2 with a foot-treadle of any well-known or approved form, (not shown herein,) which, when pressure is exerted to lift the rod n^2, will rock the lever pivoted at N in a direction to throw the feed-disk I′ away from the feed-disk I. When pressure is released from the rod n^2, the disk I′ is thrown back into yielding engagement with the disk I or with the material between them by means of a spring O, bearing at its lower end on the arm *n*′ and held at its upper end by a nut *o* on the screw-threaded end of a rod *o*′, fixed at its upper end to a bracket *a*, projecting rearwardly from the casing A′. By screwing the nut *o* up and down along the rod *o*′ the tension which presses the disk I′ toward the disk I may be loosened or increased to the greatest degree of accuracy, as may be desired.

The cam b^7, which operates the lever L for actuating the feed, may be temporarily increased to give the lever L an unusual throw by increasing the distance of the effective working surface of the cam from the center of the shaft on which it is fixed. In the present instance I accomplish this by means of a screw b^8, the head of which is made to conform to the general curved surface of the cam when the screw b^8 is screwed inwardly; but when the screw b^8 is partially unscrewed the head of the screw itself will become a part of the working surface of the cam, and it may be adjusted as far as required from the normal surface of the cam within the limits of the length of the screw. In addition to this special means of increasing the throw of the lever L there is the ordinary means of changing the position of its fulcrum from the exterior of the machine, (indicated at P, Fig. 3.)

The thread, as it is led from the supply, (see Fig. 1,) passes between a support *q*′, carried by the needle-bar, and the face of a disk Q, provided with a stem *q*, loosely seated in its support *q*′. A lever pivoted at R in a recess in the needle-bar has its short arm *r* in position to press upon the disk Q to force it toward the support *q*′, the opposite arm *r*′ of said lever being pressed upon by a spring r^2 in a direction to press the disk Q toward its support *q*′. The shape of the arm of the lever *r*′ is such with respect to the opening in the casing A′ through which the needle-bar reciprocates that when the needle-bar is at the outermost limit of its stroke the spring r^2 will have full effect upon the lever to exert pressure upon the disk Q, and hence clamp the thread firmly between the disk Q and its support. This effect is maintained until the needle-bar has moved a short distance on its return stroke, when the effect of the spring r^2 upon the lever R is moved to hold off by the engagement of the arm *r*′ with the wall of the opening through which the needle-bar reciprocates.

In operation the needle advances, carrying the thread through the two edges of the material held between the feed-disks I I′, and just as it reaches the limit of its forward movement the thread is clamped by the disk Q, as hereinabove described. As the needle starts on its rearward movement the thread is slackened, forming a loop above the surface of the feed-disk I′ or above the surface of a guide-plate *i*, fixed to a spindle about which said disk I′ revolves, and at this moment the point of the looper-hook passes transversely through the loop formed by the needle and carries it up over the edges of the material and down into position on the left of the needle as the observer looks at Fig. 3. This position is also clearly shown in Fig. 7. The needle in the meantime has reached the limit of its rearward stroke, and now, while the

looper-hook holds the position shown in Fig. 7, again advances through the loop held by the hook and then through the edges of the material to the limit of its advance movement. As soon as the needle passes through the loop held by the hook, as shown in Fig. 7, the looper-hook first lifts above the path of the needle, then moves transversely across the path of the needle above it, shedding the loop, and then moves over the edges of the material and down into position on the right-hand side of the needle (see Fig. 8) into position to again move across the path of the needle and pick up a succeeding loop (see Fig. 9) formed by the needle as it begins its return movement.

Referring to the diagrams, Figs. 10 and 11, the looper passes from the point 1 across the path of the needle in proximity to and above the needle to the point 2, thence upwardly, backwardly, and downwardly to the points 3, 4, and 5 without crossing the path of the needle, thence upwardly to the point 6, thence obliquely across the path of the needle above the said path to the point 7, thence forwardly to the point 8, and thence downwardly and forwardly to the point 1, describing the outlines of an irregular figure in space. The thread is cast off from the looper-hook at a point about midway between the points 6 and 7, referring to Figs. 10 and 11 of the drawings.

By giving to the looper-hook the movement above described I am enabled to run the machine at a very high rate of speed without causing unnecessary vibration of the needle and looper-hook and thereby insuring the looper-hook catching the loop in the thread every time. Furthermore, this movement of the looper-hook prevents the loop from being shed before the proper time therefor and also prevents the material from being crimped over by the drawing of the thread across the edge thereof, there being no drawing tension on the thread until the needle has passed through the shed loop. This peculiar movement of the hook also causes it to draw the thread over the edge of the material at substantially the same angle as it is drawn up.

What I claim is—

A needle mounted to reciprocate, means for presenting the material to be sewed across the path of the needle, a looper-hook, means for causing the looper-hook to describe the outlines of an irregular figure in space, including a movement across the path of the needle to take the loop, an upward, a backward and then a downward movement along one side of the needle-path while carrying the loop, an upward movement, a diagonal movement across the needle's path to shed the loop and a forward and then a downward movement along the opposite side of the needle's path to the point of starting and means for actuating the needle, substantially as set forth.

SELLMAR M. JACOBY.

Witnesses:
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FREDK. HAYNES.