(No Model.)

3 Sheets—Sheet 1.

D. H. & J. AGAN.

SEWING MACHINE.

No. 591,718. Patented Oct. 12, 1897.

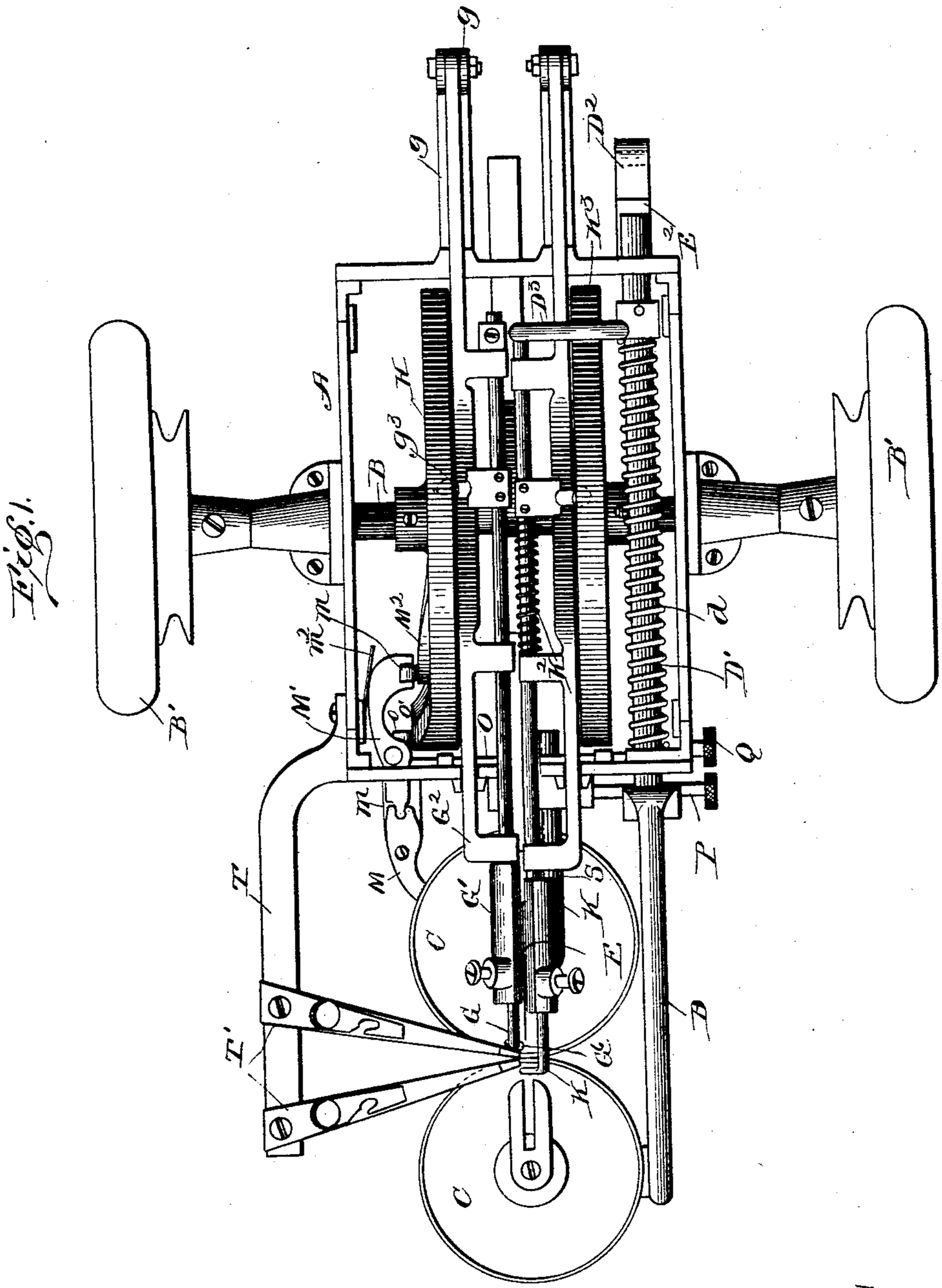

Fig. 1.

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(No Model.)

3 Sheets—Sheet 2.

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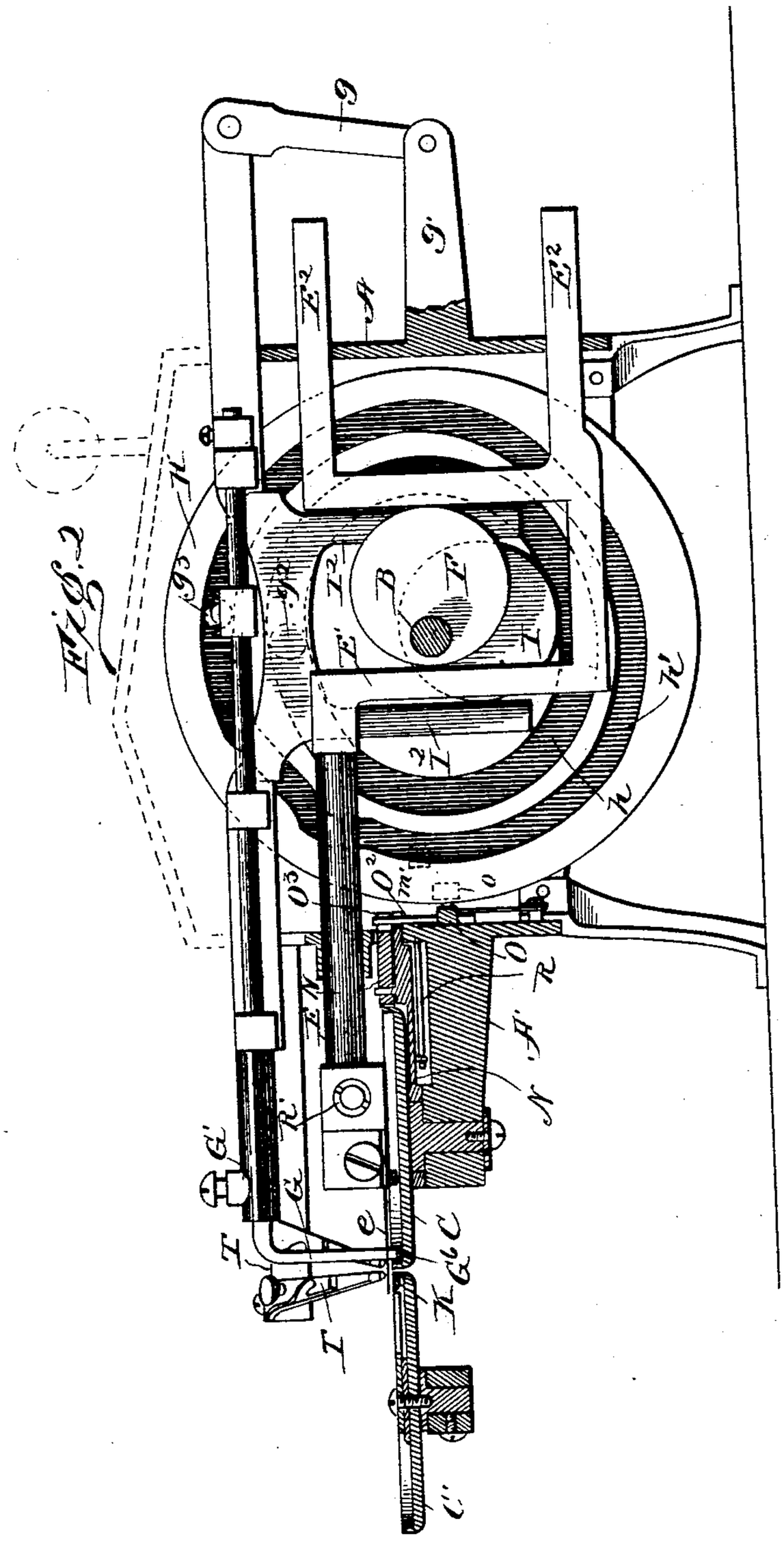
No. 591,718. Patented Oct. 12, 1897.

Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

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SEWING MACHINE.

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Fig. 3.

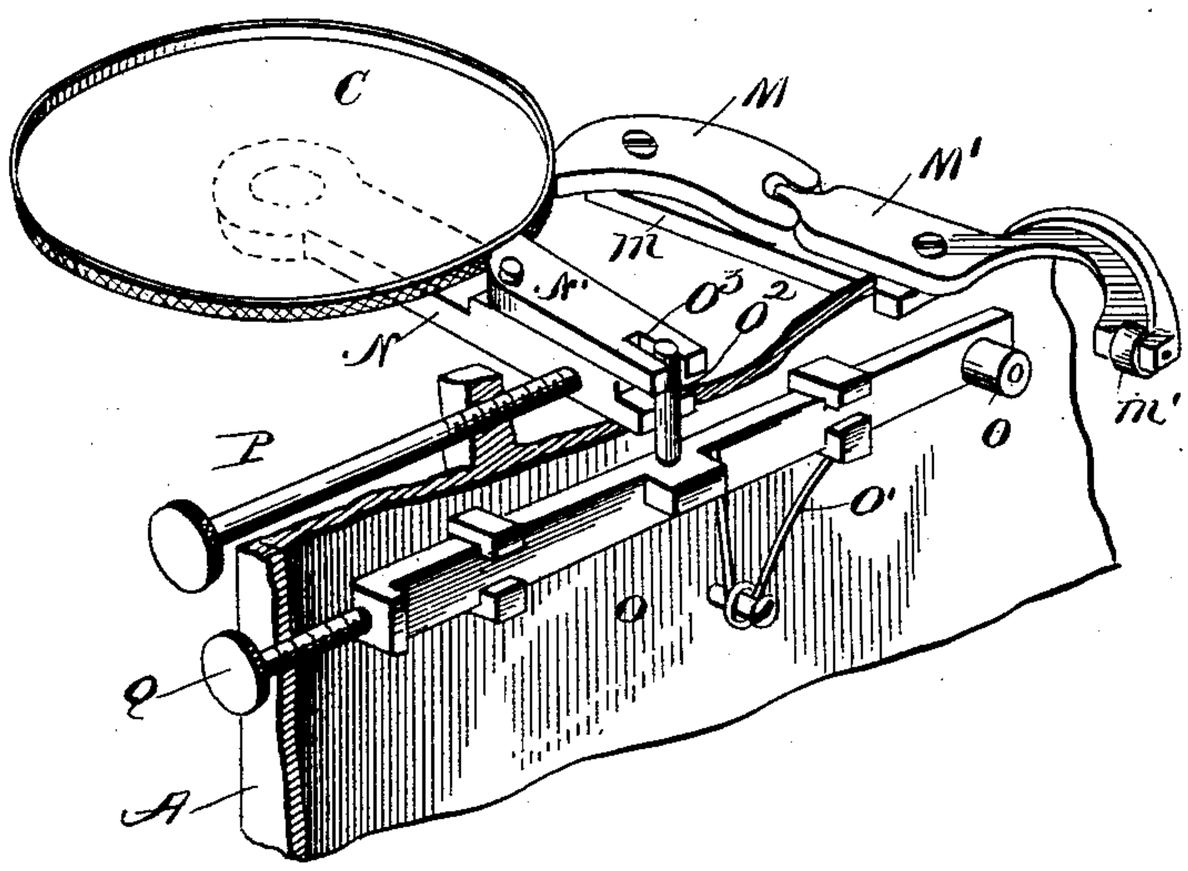


Fig. 4

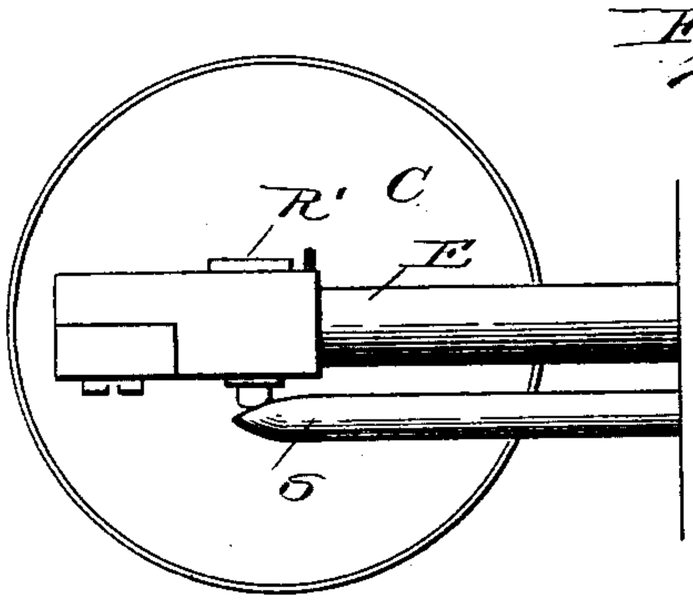
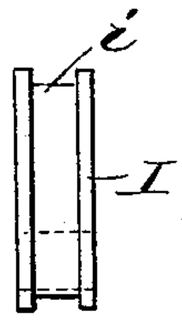


Fig. 5.



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UNITED STATES PATENT OFFICE.

DAVID H. AGAN AND JENNIE AGAN, OF NEW YORK, N. Y.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 591,718, dated October 12, 1897.

Application filed February 23, 1897. Serial No. 624,505. (No model.)

To all whom it may concern:

Be it known that we, DAVID H. AGAN and JENNIE AGAN, of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

This invention relates to improvements in sewing-machines of that type commonly known as "overseaming-machines," and more specifically to the class of machines designed with particular reference to sewing gloves, edging fabrics, and placing ornamental stitching and cording on the surface of fabrics, the objects of the invention being to produce a simple light-running machine capable of handling heavy or light goods, as required, and in which there shall be a simple and positive feed movement, together with a simple and effective looper mechanism for producing a finish on both sides of the edge of the goods operated upon.

Referring to the accompanying drawings, Figure 1 is a top plan view of a machine embodying our present improvement with the top of the casing removed. Fig. 2 is a sectional elevation, taken at right angles to Fig. 1, on a plane intermediate the looper-carriers and showing the needle-bar and needle-bar-operating mechanism in elevation. Fig. 3 is a detail perspective view of the feed mechanism. Fig. 4 is a detail top plan view of the secondary tension. Fig. 5 is a detail elevation of one of the cams for moving the looper-carriers horizontally.

Like letters of reference in the several figures indicate the same parts.

The frame (lettered A in the accompanying drawings) is shown of a conventional form, substantially rectangular, although, as will be readily understood, this is entirely immaterial, as its only function is to support and inclose the working parts of the machine. Journaled in the frame in suitable bearings is a transverse shaft B, having means whereby it is rotated, as shown, consisting of belt and hand wheels B'. At one end of the frame, Fig. 2, there is an arm or extension A', in which is journaled one of the work holding and feeding disks C, while the coöperating holding or feeding disk C' is journaled in the end of an overhanging carrier D, Fig. 1, having a relatively long shank D', supported in bearings in the frame and adapted to be moved forwardly by a bell-crank lever D^2 and to be retracted by a coil-spring *d*. The vertical pivots or shafts carrying the disks, it will be noted from Fig. 2, are short, and consequently there is no obstruction to the handling of the work beneath the level of the disks.

The needle-bar E is journaled to reciprocate in bearings at front and back of the machine-frame in position to bring the needle *e* immediately above the level of the upwardly-turned edges of the disks C' and in position to penetrate goods clamped between and projecting above the disks in the ordinary manner. The needle-bar is provided with a central opening, preferably having substantially vertical and straight sides or bearing-faces E', within which opening a cam F on the drive-shaft rotates and whereby the needle-bar is given its proper reciprocatory movement. The tilting or rotation of the needle-bar on its axis is prevented by forming its rear end with two parallel arms E^2, working in corresponding bearings in the frame, although it is to be understood that this result may be attained in any well-known way, and, in fact, the needle-bar itself may be reciprocated in any preferred manner and used in connection with the looping mechanism now about to be described.

Bearing in mind the fact that in the present machine the loop of thread cast off by the needle is caught up and spread down on both sides of the edge of the goods and in the subsequent advance the needle passes through the loop on both sides of the fabric to give a finished appearance on both sides with a single thread it will be seen that we employ two loopers for accomplishing this result. At the moment when the loop is picked up the two loopers are advancing substantially in unison or one slightly in the lead. One looper then passes over the edge of the fabric and both loopers descend, spreading the loop to the desired point. One of these loopers, (that lettered G,) which we shall term the "main looper," travels across the edge of the

goods projecting between the disks and is supported in a looper-carrier G′, journaled to rotate on its longitudinal axis in a vertically and horizontally movable secondary looper-carrier G^2, supported at the rear end upon a link *g*, which latter is in turn pivotally connected with a rearwardly-extending arm *g′* on the frame. With such arrangement by moving the secondary carrier vertically and horizontally and rotating the primary carrier G′ the movements necessary for the looper may be secured, and in order to so move the parts we provide an operating cam-disk H, mounted rigidly on the drive-shaft B and having in one of its faces two cam-grooves, one, *h*, adapted for the reception of a pin or projecting antifriction-roller g^2 (dotted lines, Fig. 2) on the secondary carrier G^2 and the other, *h′*, for the reception of a projecting pin or antifriction-roller g^3, extending laterally out from the looper-carrier G′, while an eccentric projection, or, if desired, an independent eccentric I on the drive-shaft, coöperates with vertically-arranged bearings I^2 on the secondary carrier G^2 to produce the horizontal movements. The contour of the cam-grooves *h* and *h′* is such as to elevate the outer end of the looper-carrier and to cause the looper-carrier to oscillate on its longitudinal axis, and starting from the moment when the looper is being advanced to pass through the loop raised by the initial withdrawal movement of the needle the looper passes through said loop, then rises over the edge of the fabric, and descends on the opposite side, spreading the loop in position for the needle to pass therethrough when it next advances.

The mechanism for moving the secondary looper K is similar to that described for moving the primary looper and the two mechanisms are preferably arranged oppositely with relation to each other in order to bring the looper-carriers close together and condense the mechanism into a small compass. The looper-carrier K′, in addition to the movements described in connection with the looper-carrier G′, is capable of an independent sliding movement in its bearings, being normally held retracted or in normally operative position by means of a spring K^2, for a purpose to be presently explained, and it will, of course, be noted that this looper K does not travel over the edge of the fabric, but catches the loop and depresses the same on the same side of the fabric in order that the needle may pass through the loop during its advance, and consequently the particular shape of the cam-grooves in the operating-disk K^3 for this looper is slightly varied from the cam-grooves shown in Fig. 2.

Extending from the disk-carrier shaft D′ is a lateral arm D^3, the end of which lies immediately behind the end of the looper-carrier K′ and in position to force said looper-carrier forward against the tension of its spring K^2 whenever the disks are separated by the movement of the bell-crank D^2. Thus the disks may be separated, together with the looper-carriers, to permit of the ready insertion or removal of the fabric or material being operated on. The importance of this will be apparent when it is remembered that the secondary looper K is throughout a large portion of its movement in proximity to the division-line between the disks and frequently below the upturned flange thereof, and would consequently, unless moved in unison with the disk, interfere with such movement or with the insertion of the fabric.

The particular form of the operative ends of the loopers G and K may be varied, if desired, but we prefer to employ a looper G, having a heel G^6 for depressing the thread and over which heel the needle may travel to insure a proper entry of the needle, while the looper K is a simple hook which passes through the loop and depresses the same in a forward direction to accomplish the same end.

For the purpose of feeding the fabric the disks are corrugated at their peripheries, and that nearest the frame of the machine is rotated by a mechanism, to be presently described, at the moment when the needle is withdrawn from the fabric held between the disks, and during the remainder of the time is held locked by a positive locking mechanism, which is automatically released at the moment when the feeding operation begins and engages with said disk at the moment when the feeding operation ends.

The preferred form of feeding and locking mechanism is shown in detail in Fig. 3, and the operating-cams therefor are shown in Fig. 1, and by reference to these figures it will be seen that a holding-pawl M is pivotally mounted on a projection of the frame *m*, and engaging with its rear end is an operating-lever M′, carrying an antifriction-roller *m′*, adapted to coöperate with a cam M^2 on the cam-disk H and to release the feeding-disk C at the moment when the feeding operation is taking place, but at all other times said pawl is held in positive engagement with the corrugated edge of the feeding-disk by means of a spring m^2, Fig. 1, bearing against the operating-lever.

Pivoted beneath and preferably concentric with the axis of the feeding-disk C is a feed-pawl carrier N, the free end of which extends toward the frame of the machine and carries a pivoted feeding-pawl N′, the end of which pawl projects within the frame and is adapted for coöperation with the pawl-moving mechanism, which, as shown, consists of a sliding bar O, supported in suitable bearings on the frame and having at one end a projection or antifriction-roller *o*, adapted to coöperate with a cam projection *o′* on the outer face of the cam-disk H, Fig. 1, the relation of the projections *o′* and M^2 being such that during the time the projection M^2 is operating upon the locking mechanism the projection *o′* passes in beneath the roller *o* and moves

the bar O transversely against the tension of a spring O'. The bar O carries an upwardly-extending projection or pin O^2, entering a slot O^3 in the end of the pawl N', whereby when such lateral movement of the pawl takes place the pawl N' is moved on its individual axis until it engages the feeding-disk, and a further movement of the bar O causes said pawl to bind against the disk, locking the disk, the pawl, and the pawl-carrier together and causing the disk to advance. As the pawl N' releases the disk the projection M^2 moves out of engagement with the locking-pawl-operating lever and the locking-pawl holds the disk in its advanced position.

To permit of a proper regulation of the feeding mechanism, we provide a feeding or stitch-regulating set-screw P, mounted on the frame and bearing against the pawl-carrier N in a position to limit its retrograde movement, and as a further means of adjusting this mechanism with a special reference to the necessary movement of the pawl before it engages the feeding-disk we provide a second set-screw Q, held by the frame and projecting in position to limit the retrograde movement of the sliding bar O. To insure the retrograde movement of the feeding-pawl carrier N, a spring is preferably provided for holding it in its retracted position, such spring being shown in Fig. 2 at R. The knurled heads of the adjusting-screws P and Q preferably extend out to one side of the machine, as shown in Fig. 1, in position to be easily manipulated by the hands of the seamstress.

To prevent any lateral play or looseness of the looper-carriers by providing widely-separated bearings, we preferably form grooves *i* in the cams I, into which the straight bearing-surfaces I^2 fit, and such cams being a considerable distance below the axis of the looper-carriers lateral play is practically eliminated.

We have shown in Fig. 4 an old form of tension mechanism for holding the thread and releasing it from the needle-bar at the proper moment, consisting of a headed transverse pin R', mounted in the needle-bar and adapted to receive the thread below its head, said pin being held in by spring-pressure and adapted to coöperate with a fixed release-bar S, having a grooved end upon which the end of the pin R rides during the time the needle-bar is retracted, but off of which said pin passes when the needle-bar is at the forward end of its stroke, and consequently the thread is at the latter time held and released when the bar is retracted.

It will be at once obvious to those skilled in the art that the particular style of cam employed for operating the looper-carriers may be varied, and hence we do not wish to be limited specifically to the employment of a cam-disk having cam-grooves in its face, or to the employment of eccentrics for causing the horizontal reciprocation of the parts, as either style of cam may be substituted one for the other and the same results attained.

Where it is desired to introduce cords or a cord beneath the stitching, we provide an arm T on the frame, upon which arm two cord-guides T' are mounted, their ends extending down close to the stitch-forming mechanism and in position to deliver the cords directly on the edge of the goods projecting up between the holding and feeding disks, as will be readily understood from an inspection of Fig. 1.

Having thus described our invention, what we claim as new is—

1. In a sewing-machine, the combination with the work holding and feeding mechanism, driving mechanism and reciprocatory needle-bar, of two independently supported and guided loopers coöperating with the loop cast off by the needle and spreading the same to encircle the path of the needle on both sides of the fabric whereby the needle is caused to pass through the loop on both sides of the fabric and independent operating mechanism interposed between said loopers and the driving mechanism; substantially as described.

2. In a sewing-machine, the combination with the work holding and feeding mechanism, the reciprocatory needle-bar and the driving mechanism, of coöperating independently supported and guided loopers engaging the same loop cast off by the needle and spreading the same to encircle the path of the needle on both sides of the fabric, of independent looper-carriers for said loopers and independent cams on the driving mechanism for operating said looper-carriers; substantially as described.

3. In a sewing-machine, the combination with the work holding and feeding mechanism, reciprocatory needle-bar and drive-shaft of the secondary looper-carrier, a link interposed beween said looper-carrier and frame of the machine to permit of a bodily horizontal reciprocation and vertical oscillation of said secondary carrier, cams on the drive-shaft for moving said secondary carrier vertically and horizontally, a primary looper-carrier journaled in said secondary carrier to oscillate on its longitudinal axis, a cam and an arm on said primary carrier coöperating with the cam whereby the primary carrier is oscillated and a looper mounted in said carrier; substantially as described.

4. In a sewing-machine, the combination with the work holding and feeding mechanism, the reciprocatory needle-bar and drive-shaft, of the secondary looper-carrier pivotally supported on a link at one end, a primary looper-carrier journaled to oscillate in said secondary carrier, a cam on the drive-shaft for reciprocating the looper-carriers horizontally, a cam-disk on the drive-shaft having cam-grooves therein and projections on the primary and secondary looper-carriers coöperating with said grooves to move said looper-carriers vertically and to oscillate the primary looper-carrier on its axis and a looper; substantially as described.

5. In a sewing-machine, the combination with the horizontally-arranged work holding and feeding disks, reciprocating needle-bar and transverse driving-shaft, of a secondary looper-carrier and link pivotally supporting said looper-carrier at one end, vertically-arranged bearing-surfaces on said secondary looper-carrier, a grooved cam on the driving-shaft with which said vertically-arranged bearing-surfaces coöperate to reciprocate the looper-carrier horizontally, a primary looper-carrier journaled in the secondary looper-carrier to oscillate on its longitudinal axis, a disk on the drive-shaft having cam-grooves therein and projections on the primary and secondary looper-carriers respectively for moving the secondary looper-carrier vertically and oscillating the primary looper-carrier on its longitudinal axis; substantially as described.

6. In a sewing-machine, the combination with the horizontally-arranged work holding and feeding disks, one of said disks being movable with relation to the other and a needle-bar and driving mechanism substantially as described, of a looper for spreading the loop cast off by the needle, an operating mechanism therefor including a looper-carrier adapted to be moved abnormally, a feed-disk-moving mechanism and connection between said feed-disk-moving mechanism and looper-carrier whereby when the feed-disks are separated the looper-carrier is moved in unison with the movable disk; substantially as described.

7. In a sewing-machine, the combination with the fixed and movable work holding and feeding disks, the carrier for the movable disk and means for moving said carrier and disk, of a reciprocatory needle-bar, a looper and looper-carrier, driving mechanism for said needle-bar and looper-carrier and an arm on the disk-carrier coöperating with the looper-carrier to move said parts in unison when the disks are separated; substantially as described.

8. In a sewing-machine, the combination with the horizontally-arranged work holding and feeding disks, one of said disks being movable with relation to the other, a disk support or carrier with means for moving the same, a driving-shaft, a reciprocatory needle-bar driven from said shaft, of a looper and primary looper-carrier held in working position by spring-pressure, mechanism for operating said looper-carrier and an arm on the feeding-disk support or carrier coöperating with the looper-carrier to move the same when the feeding-disks are separated; substantially as described.

9. In a sewing-machine, the combination with the stitch-forming mechanism and the work holding and feeding disks, of a reciprocating feeding-pawl coöperating with one of said disks to rotate the same and a lock engaging the disk for holding the same against retrograde movement, with connections between said lock and the driving mechanism, whereby the lock is moved out of contact with the disk by the driving mechanism during the time the feeding-pawl is operative; substantially as described.

10. In a sewing-machine, the combination with the stitch-forming mechanism, driving-shaft and work holding and feeding disks, of a feeding-pawl coöperating with one of said disks, a lock for holding said disk against retrograde movement and cams rotated by the drive-shaft and coöperating with the feeding and locking mechanism to alternately throw the same into and out of engagement with the disk; substantially as described.

11. In a sewing-machine, the combination with the drive-shaft, stitch-forming mechanism and rotary work holding and feeding disks, of a feeding-pawl coöperating with one of the disks, an operating mechanism for said pawl, a cam on the drive-shaft coöperating with said pawl-operating mechanism, a locking-pawl coöperating with the disk to prevent retrograde movement thereof, an operating-lever controlling said locking-pawl and a cam carried by the drive-shaft coöperating with said operating-lever to release the pawl when the feeding mechanism is operative; substantially as described.

12. In a sewing-machine, the combination with the stitch-forming mechanism, drive-shaft and rotary work holding and feeding disks, of a pivoted pawl-carrier, a pawl pivotally mounted on said carrier, an adjustable stop for limiting the movement of the pawl-carrier, a cam on the drive-shaft, a spring-pressed-pawl operator having a projection lying in the path of said cam and an adjustable stop for limiting the movement of said pawl-operator; substantially as described.

13. In a sewing-machine, the combination with the stitch-forming mechanism, drive-shaft and work holding and feeding disks, a pawl-carrier pivoted concentrically with one of said disks, a pivoted pawl mounted on said carrier and coöperating with the disk, a spring for holding the pawl-carrier in normal position, a stop for limiting the movement of the pawl-carrier to regulate the extent of feed, a pawl-operating slide coöperating with the rear end of the pawl and controlling its engagement with the disk, a cam on the drive-shaft and a projection on the pawl-operating slide coöperating with said cam; substantially as described.

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