

No. 705,605.

Patented July 29, 1902.

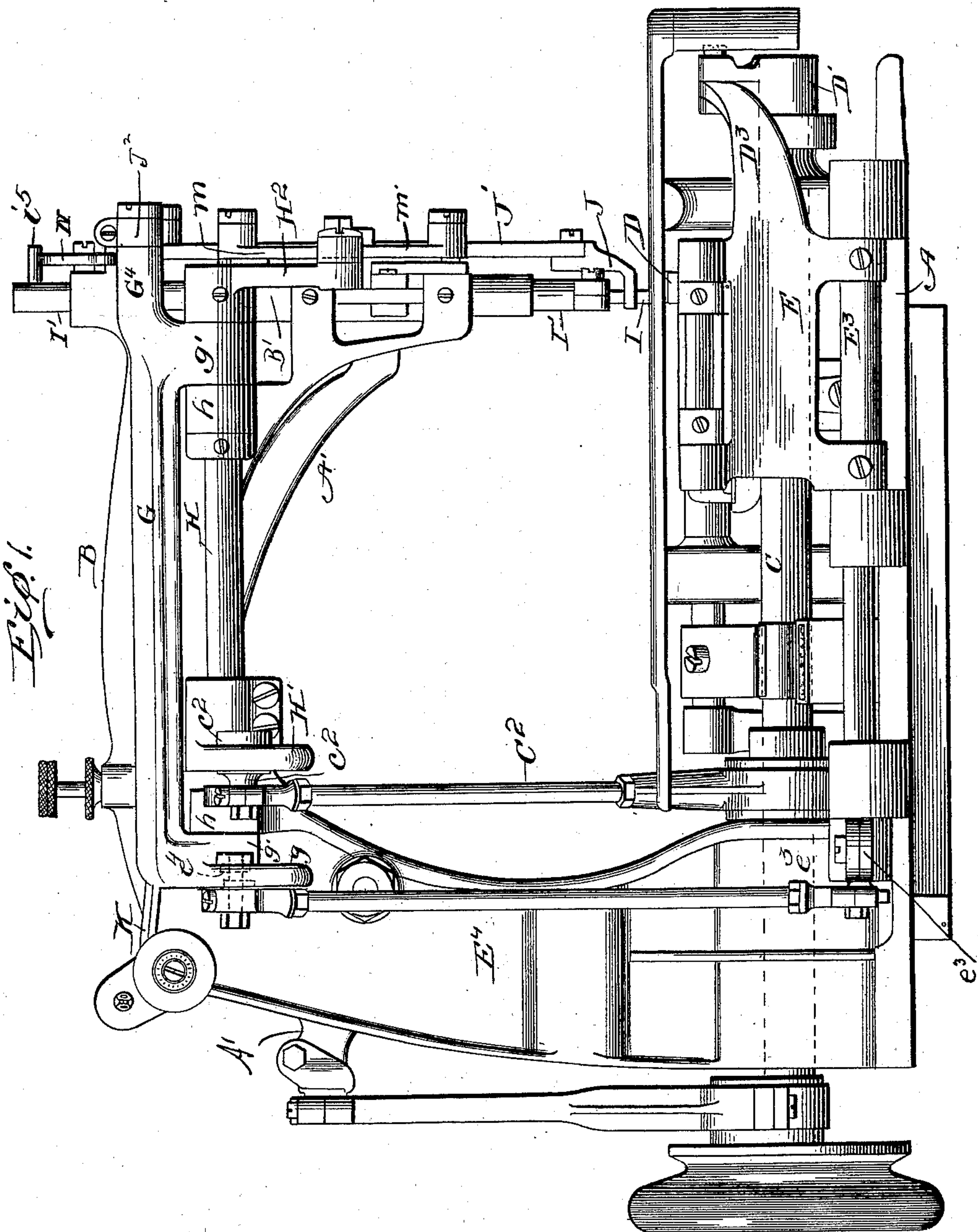
L. ONDERDONK.

FEEDING MECHANISM FOR SEWING MACHINES.

(Application filed Nov. 9, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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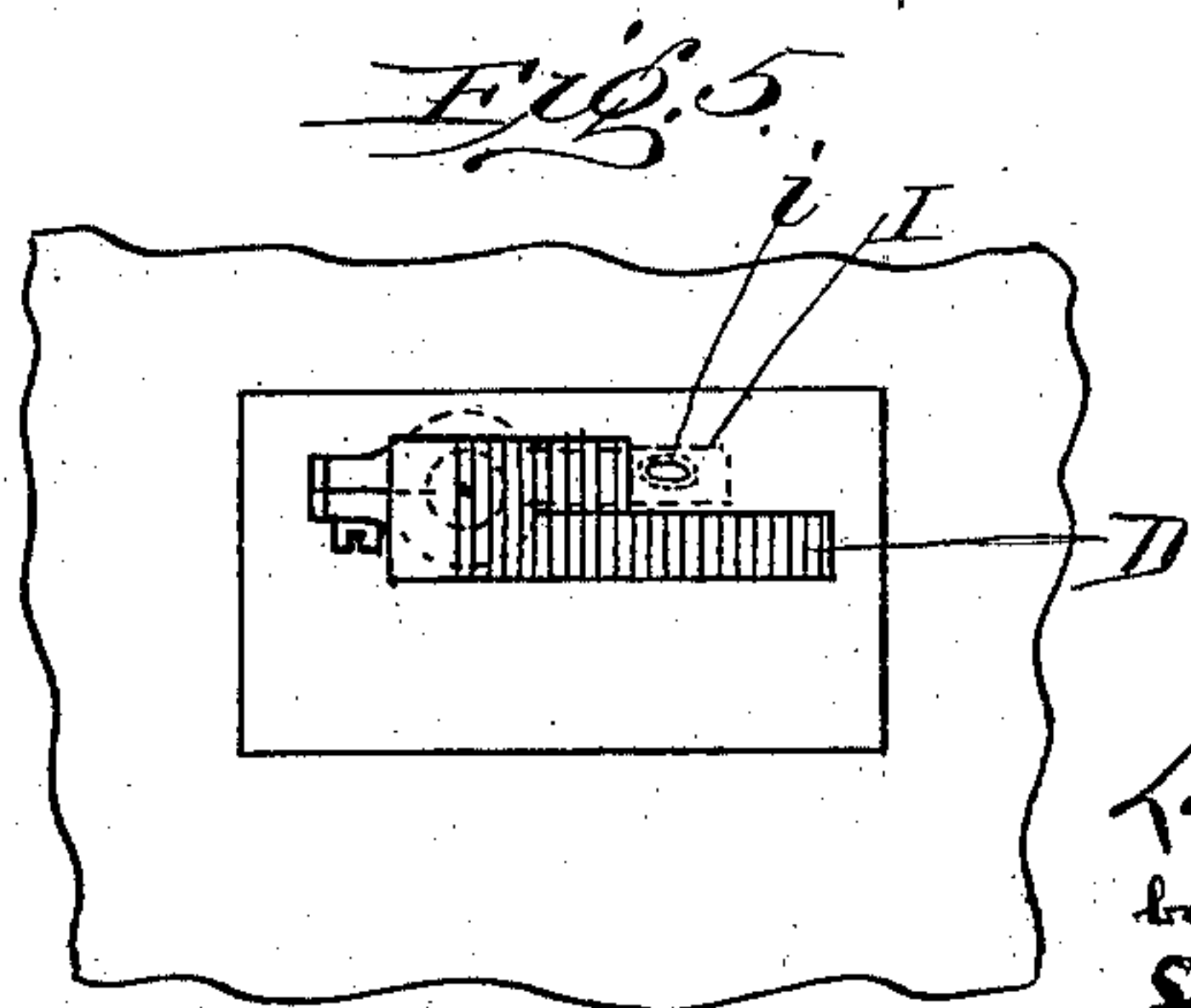
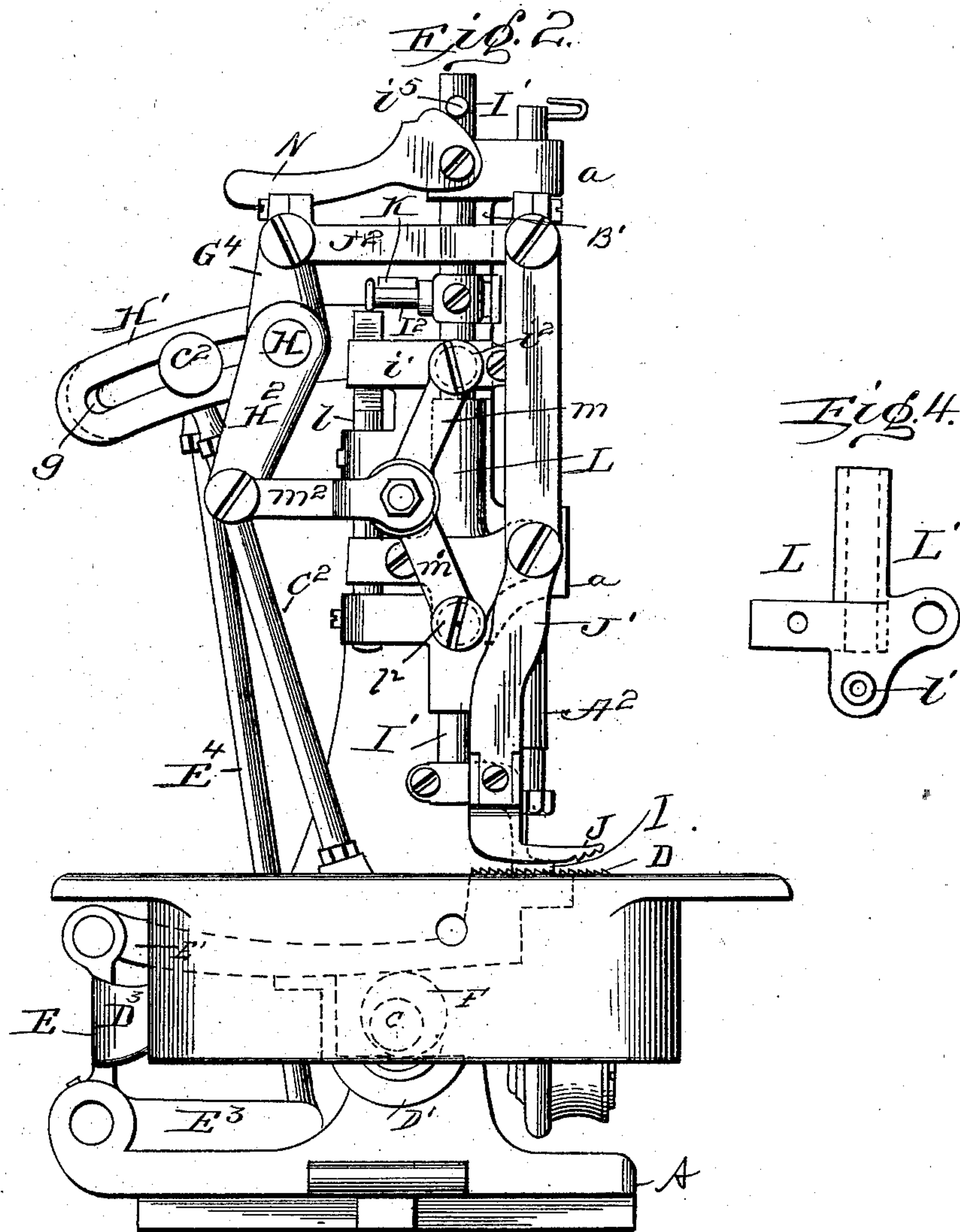
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3 Sheets—Sheet 2.



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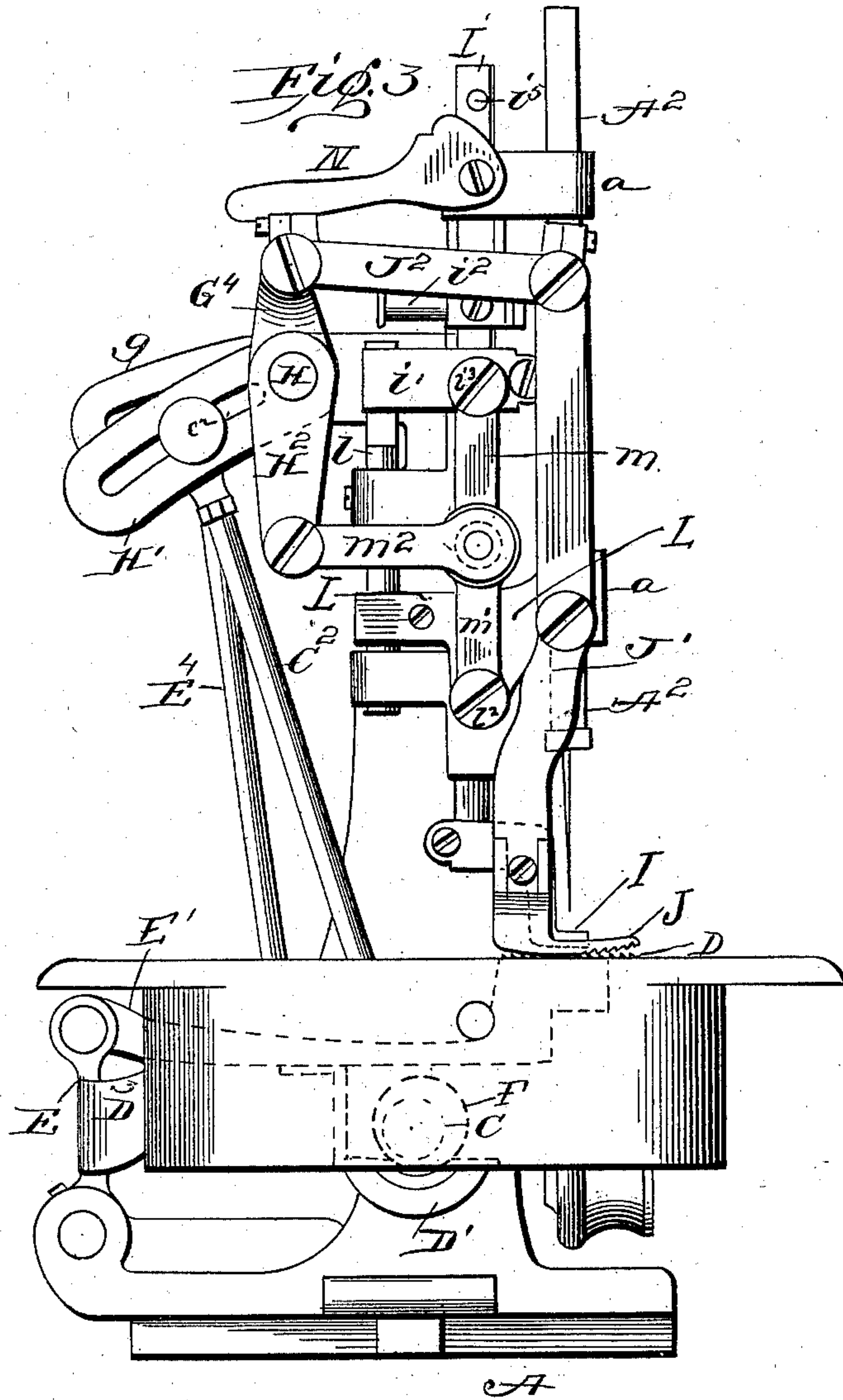
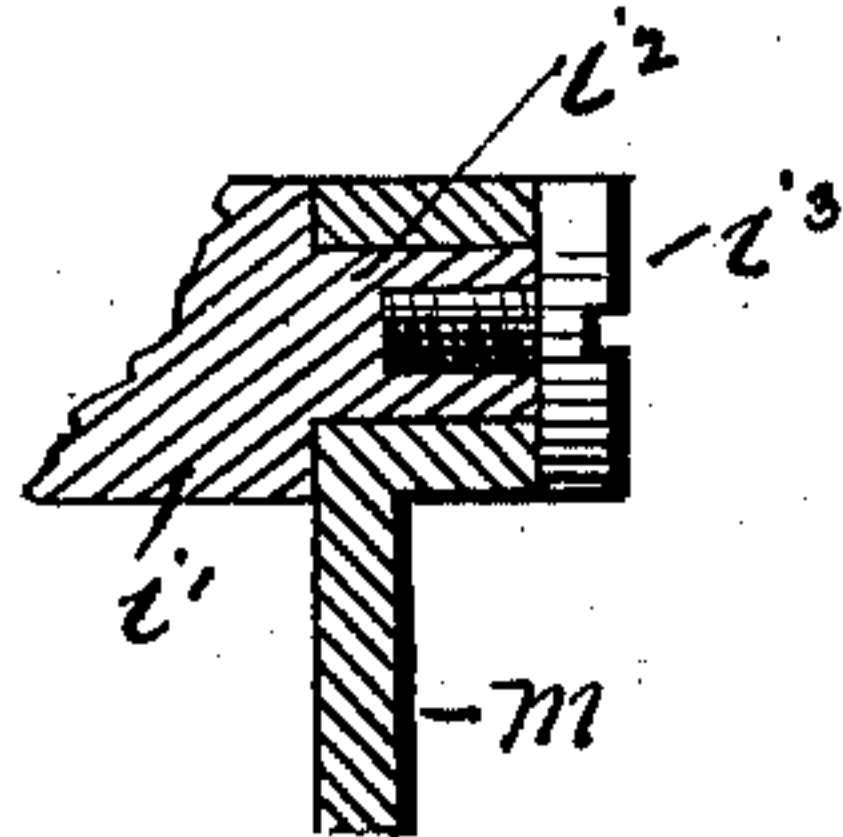


Fig. 6



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UNITED STATES PATENT OFFICE.

LANSING ONDERDONK, OF NEW YORK, N. Y., ASSIGNOR TO THE UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 705,605, dated July 29, 1902.

Application filed November 9, 1901. Serial No. 81,764. (No model.)

To all whom it may concern:

Be it known that I, LANSING ONDERDONK, a citizen of the United States, residing at New York city, in the county of New York, State of New York, 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.

10 This invention relates to that class of sewing-machines having walking or vibrating presser-feet.

The objects of the present improvements are to provide a presser-foot that will readily climb over seams; also, to provide a presser-foot mechanism which will prevent two overlying pieces of material from being moved one upon the other while being stitched together; also, to provide the presser-foot mechanism with a feeding-foot which will cooperate with and partake of the adjustment of the feed-dog to clamp the goods therebetween and then move with the feed-dog to carry the goods along; also, to provide in addition to such clamping and feeding foot a second or needle presser-foot, which lies to one side of the feed-dog and holds the goods down on the throat-plate at the needle-opening while the needle is passing through the goods and until it has been raised out of the same; also, to provide a presser-foot mechanism which will serve to hammer or pound the work passing thereunder and which will be particularly desirable in two-needle machines used in staying seams in leather or other heavy material. These objects I accomplish by the mechanism shown in the accompanying drawings, in which—

40 Figure 1 is a rear elevation of a sewing-machine with my improvements applied. Fig. 2 is an end elevation thereof. Fig. 3 is a similar view with the parts in a different position. Fig. 4 is a detail view. Fig. 5 is a detail view showing the throat-plate and the feed-dog with the needle presser-foot in dotted lines, and Fig. 6 is a detail view hereinafter referred to.

A designates the bed; B, the gooseneck; C, the main shaft; D, the feed-dog, mounted on

the feed-bar E', receiving its four motion from 50 the cam F on the main shaft and the rocker-arm E at the rear of the bed. The rocker-arm E is provided with an operating-arm D³, which extends around to a stitch-regulating device D' on the end of the main shaft C, 55 from which the rocker is operated. A' designates the needle-arm, and A² the needle-bar, mounted in guide-lugs *aa* on the front of the head B' of the gooseneck. All of these parts are substantially identical with what is shown 60 in Patent No. 299,568, granted to Muther and Dearborn June 3, 1884, with this exception, viz: The rocker-arm E is in the present instance fixed to a rock-shaft E³, which extends along the rear side of the bed parallel with 65 the main shaft and is provided at its inner or right-hand end with a crank-arm *e*³, connected adjustably at its free end by a connecting-rod E⁴ and block *e*⁴ with an outwardly-projecting slotted crank-arm *g* at the inner or 70 right-hand end of a second longitudinal rock-shaft G. The rock-shaft G is provided with depending bearings *g' g'*, turning on a third longitudinal rock-shaft H, mounted in bearings *h h* on the rear side of the gooseneck and 75 actuated from the main shaft C by means of a connecting-rod C², extending from an eccentric thereon up to an adjustable block *c*², mounted in a slot in a crank-arm H', projecting from said rock-shaft H. On the 80 outer end or head of the gooseneck is mounted a vertically-reciprocating cross-head L, having a central tubular portion L', through which the needle presser-foot bar I' freely reciprocates, and the cross-head is further 85 guided at its rear edge upon a vertical guide-rod *l*. The said needle presser-foot bar I' is provided above the cross-head with an adjustable operating-arm *i'*, also guided by said rod *l* and having a round stud *i*², on which 90 the upper end of a toggle-link *m* is pivotally held by a screw *i*³, the cross-head L being also provided with a similar round stud *l'*, on which the lower end of a toggle-link *m'* is pivotally held by a screw *l*², the overlapped 95 inner ends of the said two links *m m'* being pivotally connected to a third link *m*², the rear end of which is pivotally connected to

the end of a crank H^2 on the outer end of the rock-shaft H. The rock-shaft H thus imparts vertical movement to the needle presser-foot bar I', which carries the presser-foot I at its lower end, and also imparts vertical movement to the said cross-head L by means of the toggle-lever formed by said links.

The presser-foot I is provided with a needle-opening i and overlies the throat-plate around its needle-aperture to hold down the work and strip the needle, and the said presser-foot I works in a recess formed in the other presser-foot J. To the cross-head L is pivoted between its ends the four-motion feeding presser-foot bar J', the lower face of the presser-foot J being opposed to the upper face of the feed-dog D and operating in conjunction therewith to clamp the work and then feed it while so clamped. The up-and-down motion of the said feeding presser-bar J is imparted by the cross-head L, and the oscillating motion of said bar J' is imparted to it by a transverse link J², pivotally connecting its upper end with a crank G⁴ on the outer or left-hand end of the rock-shaft G.

K is a strong spring which bears at its free end upon an adjustable arm I² on the upper end of the needle presser-bar I'.

It will be seen that as the mechanism for oscillating the presser-bar J' is all above and beyond the work-plate of the machine the work may be the full width of the work-plate, as no obstruction exists thereto.

The operation is as follows: When the needle is in its lowest position, the toggle-links $m m'$ will have been pulled rearwardly by the crank H^2 , (see Fig. 2,) and therefore the link m , assisted by power of spring K, will have forced the needle presser-foot I down on the work and the link m' will have raised the cross-head L and with it the feeding presser-bar J'. As the needle is raised by its arm the fulcrum for the cross-head will be at the presser-foot I, where it remains till the needle has been stripped, at which moment the toggle-links will have been forced inwardly and the feeding presser-foot J brought down onto the work, as shown in Fig. 3. As the presser-foot J is moved down the feed-dog will be moved up toward the work. While so moving toward each other to grasp the work the feed-dog and the feeding presser-foot will have both been moved toward the operator through the medium of the rock-shafts E³ G and then moved away with the work between them to effect the feed. At the moment when the feeding presser-foot J is forced firmly down on the work it forms the fulcrum or resistance to the toggle-link m' , and so the link m forces the needle presser-bar I' up and raises its foot from the goods on the work-plate. Thus the two presser-bars are independently operated vertically and alternately in opposite directions,

the four-motion feeding presser-foot operating in perfect unison with the four-motion feed and the needle presser-foot being given two motions necessary to cooperate properly with the needle and with the feed.

It will be seen that in a high-power machine of this kind the rapid movement of the two presser-feet will cause them to pound the work and smooth and flatten it, which is very desirable in leather-work. In sewing overlapped pieces the feed will not cause one to slip on the other, as both are firmly clamped together between the feed-dog and feeding presser-foot during the feed and then firmly clamped to the throat-plate when the needle is stitching. Then, again, as the throw of the feeding presser-bar J' is from the same shaft E³ which imparts the throw to the feed-dog both may be simultaneously adjusted by the stitch-regulating device D'. By adjusting the block e^4 or other connection between the connecting-rod E⁴ and the slotted arm g of crank-shaft G toward or from the said shaft the throw of the feeding presser-foot J' may be increased or diminished over the throw of the feed-dog when it is desired to have said presser-foot move at a different length of stroke from said feed-dog. Thus the upper layer of work may be full or puckered on the lower layer after the manner of a ruffling device. So, also, by adjusting the block c^2 in the crank-arm H' the vertical movement of the two presser-bars may be increased or diminished for the purpose of accommodating different grades of work. In order that both presser-foot bars may be simultaneously raised, I provide the upper end of the needle presser-bar I with a pin or projection i^5 and a pivoted lifting-cam N thereunder, by raising which said presser-bars will be raised without in any way affecting or changing their relative positions.

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

1. In a sewing-machine, the combination with the stitch-forming mechanism, of a vertically-reciprocating cross-head, a vertically-reciprocating needle presser-foot to hold the work on the throat-plate around the needle and strip the needle, a feeding presser-bar pivoted to the cross-head for vertical movement thereby and having a presser-foot on its lower end, mechanism for positively vibrating the said feeding presser-bar in both directions, a rock-shaft actuated from the main shaft of the machine, and operative connections between the said rock-shaft, the cross-head and the needle presser-bar; substantially as described.

2. The combination, in a sewing-machine, with the stitch-forming mechanism, of a vertically-reciprocating cross-head, a vertically-reciprocating needle presser-foot to hold the work on the throat-plate around the needle

and strip the needle, a feeding presser-bar pivoted between its ends to the cross-head and having a presser-foot at its lower end, means for vibrating the feeding presser-bar, a rock-shaft actuated from the main shaft of the machine, and a toggle-lever connecting said rock-shaft with the said cross-head and needle presser-bar; substantially as described.

3. The combination, in a sewing-machine, with the four-motion feed including a rock-shaft having a rocker-arm to impart the throw to the feed-dog and actuated from the main shaft, a rock-shaft along the gooseneck and actuated from the first-named rock-shaft, a second rock-shaft along the gooseneck and actuated from the main shaft, a vertically-reciprocating needle presser-bar having a foot to hold the work at the needle, a vertically-reciprocating cross-head on the machine-head, a three-link toggle-lever connecting the last-named rock-shaft to the cross-head and the needle presser-bar to move them alternately in opposite directions, a four-motion feeding presser-bar pivoted between its ends to said cross-head and at its upper end linked to the second-named rock-shaft to operate in unison with the feed-dog, and provided at its lower end with a foot opposed to said feed-dog; substantially as described.

4. The combination, in a sewing-machine, with the four-motion feed including a rocker, of a four-motion presser-bar having a presser-foot opposed to the feed-dog to cooperate therewith, means for oscillating the said presser-bar positively in both directions from the feed-rocker, including an adjustable member for changing the throw of the said feeding presser-bar, a needle presser-bar having a foot to hold the work to the throat-plate at the needle-opening therein; and means for imparting vertical movement to said presser-

bars alternately in opposite directions; substantially as described.

5. In a sewing-machine, the combination with the four-motion feed, of a four-motion presser-bar oscillated positively in both directions from the feed mechanism and provided with a foot opposed to feed-dog to cooperate therewith in feeding the work, a vertically-reciprocating needle presser-bar having a foot to hold the goods to the throat-plate at the needle-opening therein, operative connections between the two presser-bars for reciprocating them alternately up and down in opposite directions, a rock-shaft for actuating said operative connections, and adjustable connection between the main shaft and the said rock-shaft to increase or diminish the movement thereof, whereby the vertical movement of said two presser-bars may be adjusted for different grades of work; substantially as described.

6. In a sewing-machine, the combination with a four-motion feed, of a vertically-reciprocating needle presser-foot bar having a presser-foot to hold the work down on the throat-plate and strip the needle, a four-motion feeding presser-foot bar, connections between the bars for reciprocating them vertically and alternately in opposite directions, means for imparting a positive oscillating movement to the feeding presser-bar in both directions from the four-motion feed, and a cam-lever for simultaneously raising both presser-foot bars without affecting their relative arrangement; substantially as described.

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

LANSING ONDERDONK.

Witnesses:

W. H. BOYER,
W. E. WEAVER.