(No Model.) 2 Sheets—Sheet 1.

L. MUTHER.

SEWING MACHINE.

No. 506,527. Patented Oct. 10, 1893.

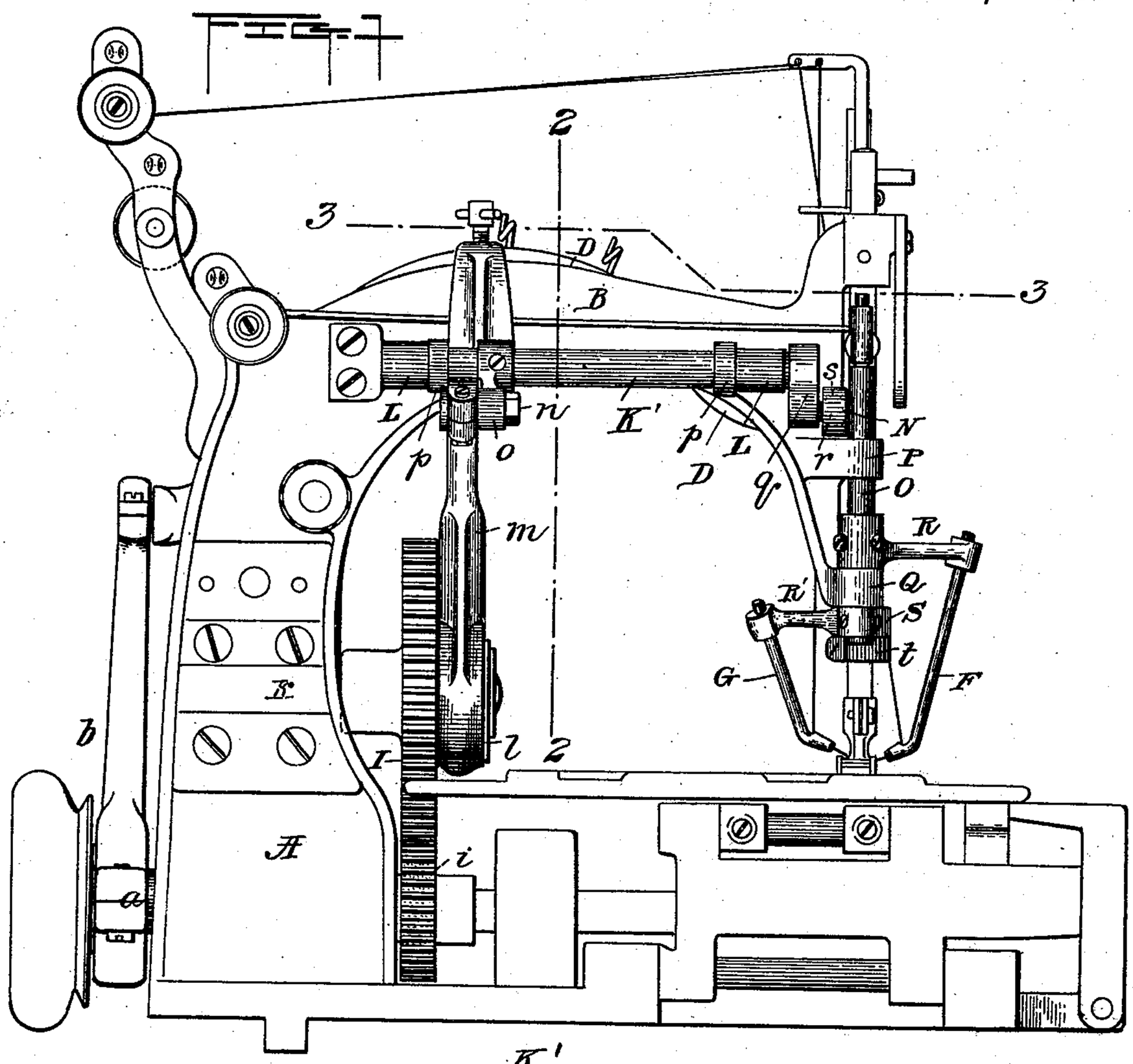
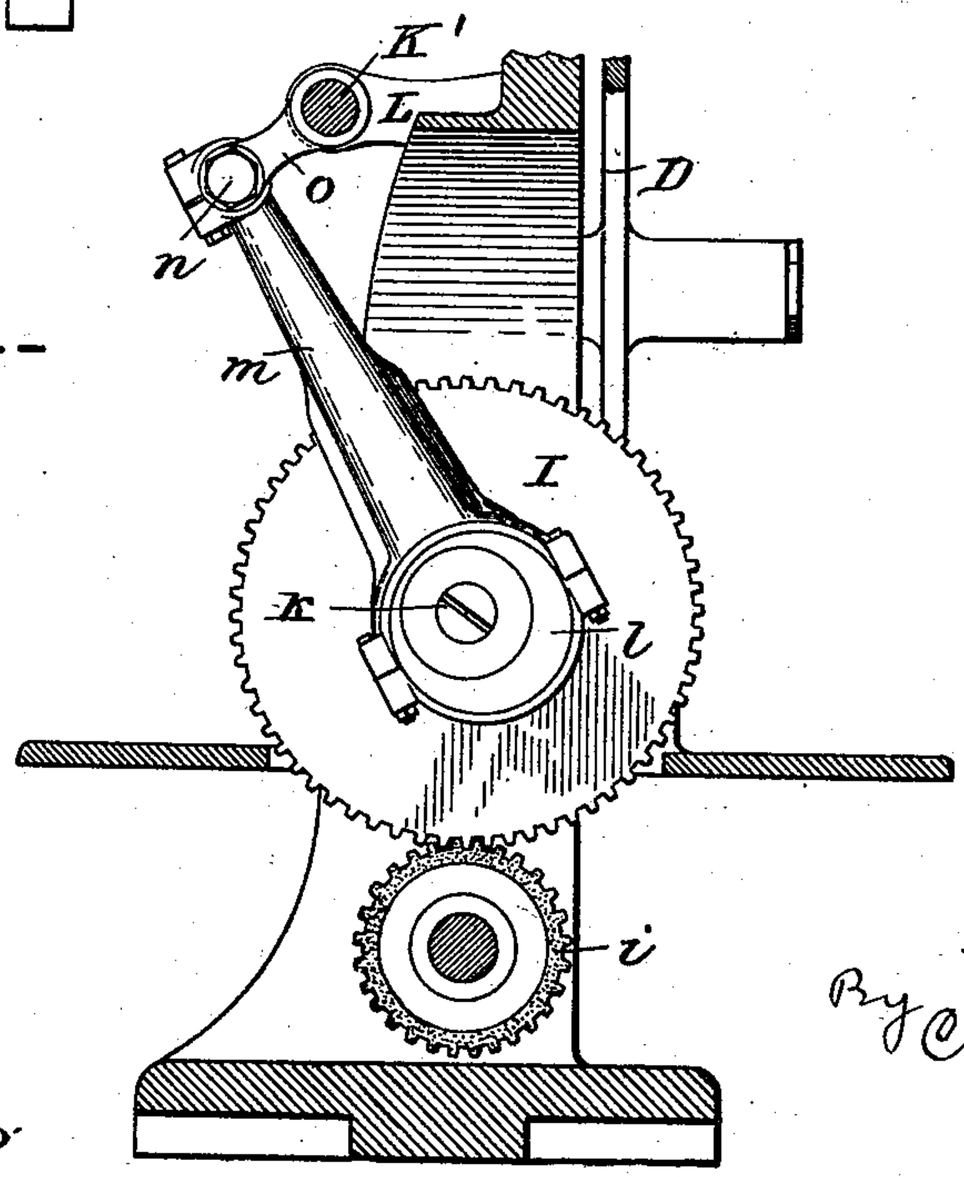


FIG. 2.



Witnesses
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Gales P. Moore.

Inventor
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his Attorney

(No Model.) 2 Sheets—Sheet 2.

L. MUTHER.

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FIG. 3.

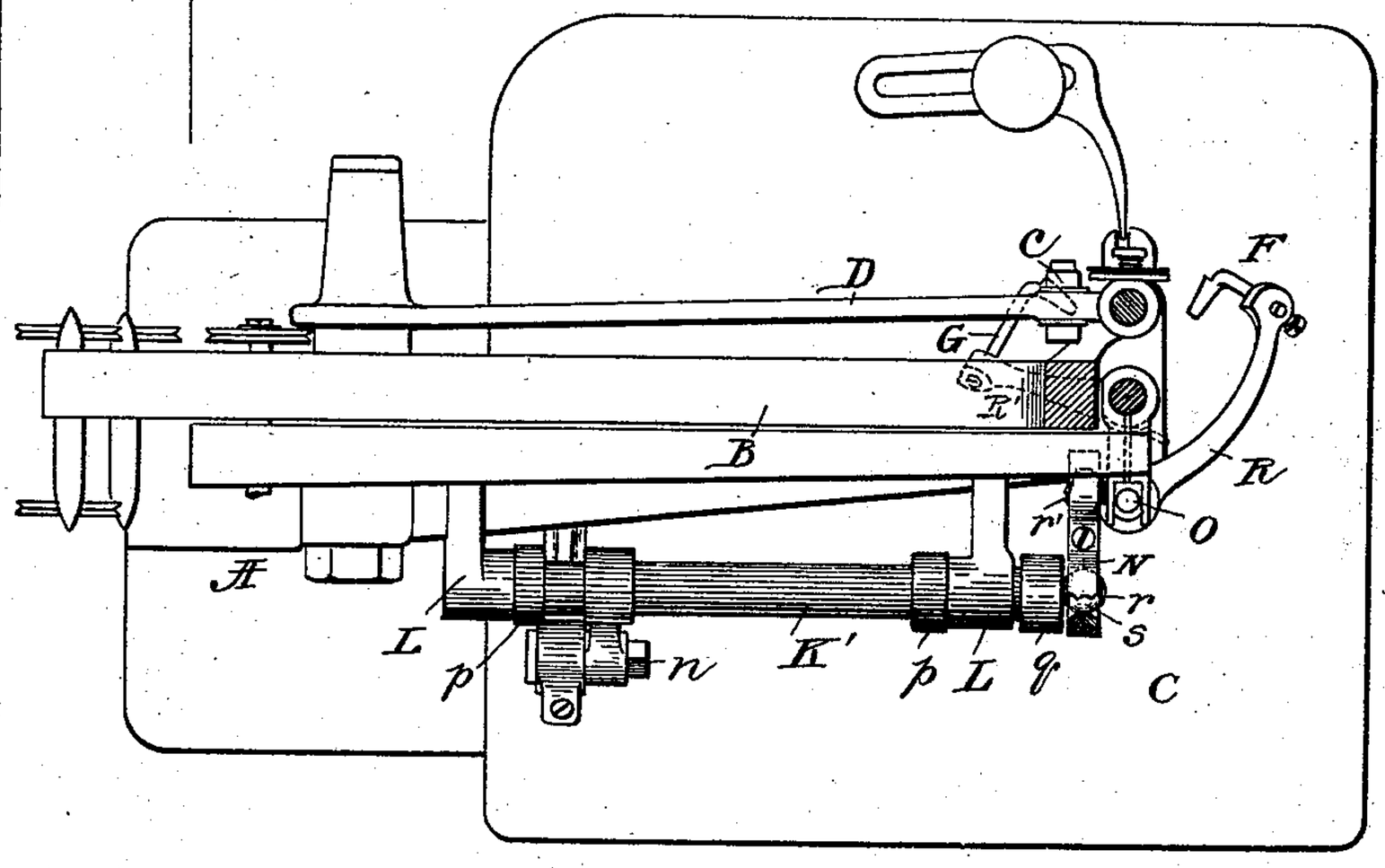
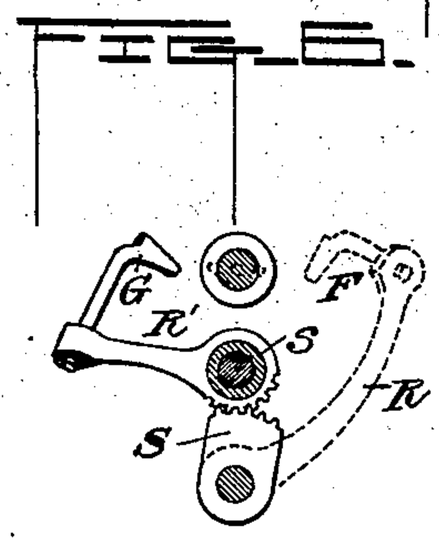


FIG. 4.



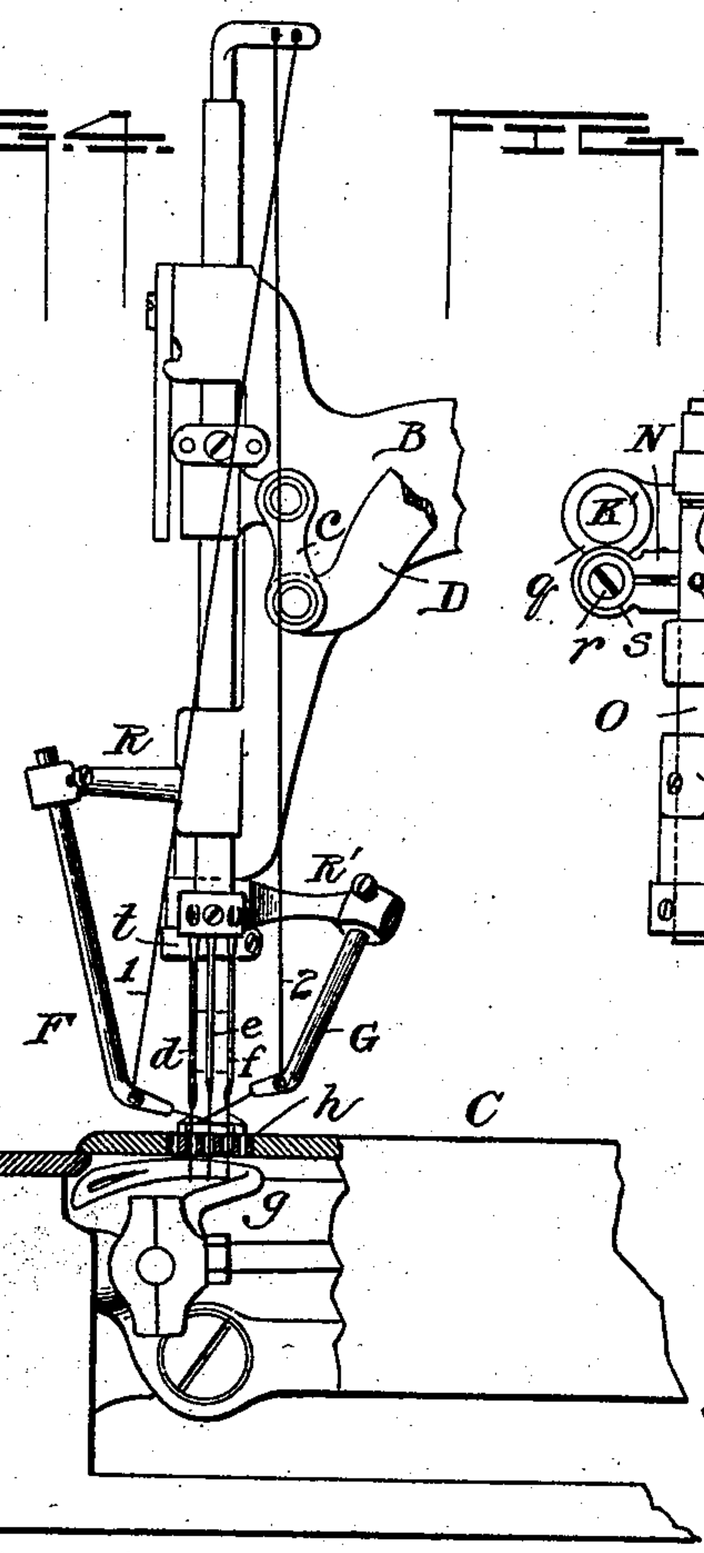
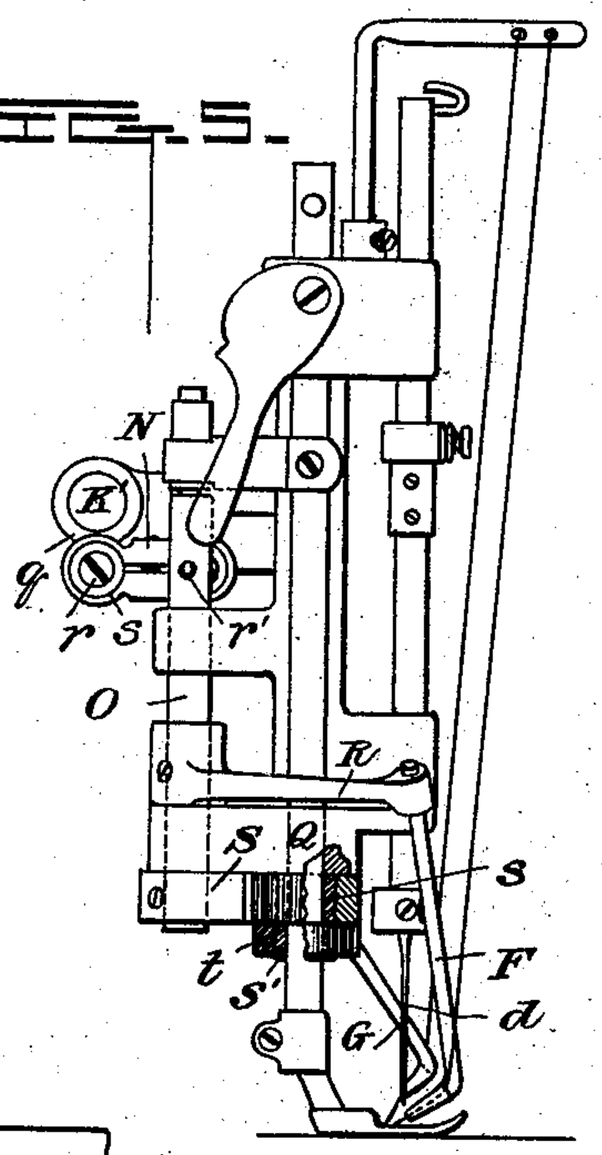


FIG. 5.



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UNITED STATES PATENT OFFICE.

LORENZ MUTHER, OF OAK PARK, ASSIGNOR TO THE UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 506,527, dated October 10, 1893.

Application filed April 15, 1892. Serial No. 429,367. (No model.)

To all whom it may concern:

Be it known that I, LORENZ MUTHER, a citizen of the United States, residing at Oak Park, in the county of Cook and 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 and figures of reference marked thereon.

My invention relates to sewing machines and particularly to that class in which a plurality of vertically reciprocating needles are employed in combination with supplemental thread carriers reciprocating back and forth in front of the needles across the line of seam thereby laying threads from one row of stitches to the other, the rows of stitches securely binding said cross threads and forming a seam well known in the trade useful either for ornamenting the flat face of a fabric, for uniting two fabrics or for forming an edging thereon.

The present invention relates not to the form of stitch nor to any portion of the stitch forming mechanism, but to an improved means for reciprocating the thread carriers back and forth across the line of the seam, to lay the thread or threads from one row of stitches to the other. Heretofore many mechanical movements have been devised for this purpose; but my object is to provide a series of connections between the main shaft of the machine, and the thread carriers which shall be comparatively simple in construction, and free from liability to get out of order.

I have herein shown my invention as applied to a machine of the type known as the Union Special but employing three needles for making three rows of stitches, a looper for securing the stitches on the under side, a two tongued throat plate through which the needles pass, and two oscillating thread carriers reciprocating back and forth across the line of feed, but I make no claim in this application to any of these features but merely to the means for oscillating the thread carriers.

My invention, therefore, consists in the matters hereinafter described and referred to in the appended claims.

In the accompanying drawings which illustrate the invention Figure 1 is a rear elevation of a sewing machine provided with my invention. Fig. 2 is a view on line 2—2 of Fig. 1, part being shown in section. Fig. 3 is a top plan view partly in section on line 3—3 of Fig. 1. Fig. 4 is a front view partly in section showing the needles, throat plate, and looper and their operating parts, the needles being shown as rising from their lowest to their highest position. Fig. 5 is an end view partly in section of the machine. Fig. 6 is a detail sectional plan of the connections between the thread carriers.

In the drawings A represents the frame of the machine, B the gooseneck and C the bed plate. The needle arm lever D is driven from the main shaft E by means of the usual eccentric and connecting rod *a*, *b*, respectively. The needle bar lever is attached to the needle bar by means of the link *c* and gives to it a vertical reciprocation in the usual manner. The ordinary eye-pointed needles are secured to the lower end of the needle bar in any suitable manner and as herein shown three of said needles *d*, *e*, *f*, are used, though the particular number is immaterial. A single looper *g* driven in the usual manner from the lower end of the needle bar lever co-operates with the needles to form parallel rows of stitches. A throat plate *h* having two tongues and three slots for the passage of the needles is also illustrated though I make no claim to such device.

Co-operating with the needles and reciprocating from side to side across the line of the seam are two oscillating thread carriers F, G, which lay cross threads, 1, 2, in front of the needles from one row of stitches to the other (if two needles are used) and between the two outer rows if more than two needles are used, the intermediate needle in such case acting to bind the threads 1, 2, together and to the fabric at the point where they cross.

While I have herein shown my mechanical movement as used for the purpose of causing two thread carrying arms to reciprocate back and forth across the line of the seam, it will be understood that in its broad sense the invention is not limited to any particular number of thread carrying arms. The means for oscillating these thread carriers constitute the

important feature of the present invention and I will, therefore, proceed to describe the same.

Fixed on the main shaft of the machine is a gear wheel *i* which meshes with a second gear wheel I rotatably secured on a shaft *k* bearing in the lower part of the vertical frame of the machine. Rotating with the gear wheel I is an eccentric *l* to which is attached one end of the eccentric rod *m*. This rod *m* has a split bearing at its upper end through which passes and in which is journaled the stud or bolt *n*. Fixed to this stud or bolt *n* at one end is a link *o* rigidly secured at its opposite end to the rock shaft K′ journaled in suitable bearings L on the overhanging arm of the machine and held from longitudinal displacement by the collars *p*. Rigidly attached to the forward and of said rock shaft is a crank *q*. The said crank is provided with a collar encircling the end of said rock shaft and is rigidly attached thereto by screws and the horizontally extending arm *r* is preferably attached to the crank *q* by means of its screw threaded end. Said horizontally extending arm is rounded as shown at *s* to form a ball joint which is adapted to fit within the socketed end of a link N thereby forming a ball and socket joint connection between the rock shaft and the link. This link N is also socketed at its inner end and is adapted to fit over the ball shaped portion of a second screw *r′* similar to the horizontal arm *r* and rigidly secured to the vertical shaft O which has a bearing in horizontal extensions of the machine frame as P, Q. One of the thread carriers F is attached to the end of a horizontally curved arm R rigidly secured at its inner end to the vertical shaft O. In the movement of the machine it will be seen that the thread carrier F will reciprocate back and forth across the line of the seam in front of the vertical needles.

To the lower end of the vertical shaft O is rigidly attached a segment as S having a number of teeth formed in its periphery adapted to mesh with corresponding teeth formed on the end of the horizontal arm R′ to which the thread carrier G is secured. This arm R′ is journaled on the downwardly extending sleeve *s* attached to the frame extension or cross head Q which sleeve encircles the presser foot bar. This arm R′ is held from downward displacement by means of a collar *t* embracing the lower end of the sleeve *s*. It will be seen that as the rock shaft is oscillated the movement will be transmitted through the ball and socket connection to the vertical shaft O and thence to the thread carriers causing them to reciprocate in opposite directions across the line of the seam and in front of the needles.

While I have herein shown my invention as applied to a machine in which a plurality of needles are used and supplemental thread carriers, it will be understood that I do not desire to be limited to any particular number of needles or thread carriers.

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

1. In a sewing machine, in combination with the main shaft, stitch forming mechanism, a horizontally arranged rock shaft, a connection between the main and rock shafts for oscillating the latter, a vertical shaft, a thread carrying device driven thereby, a link located between the rock shaft and the vertical shaft, and universal joints connecting the ends respectively of the link with said shafts, substantially as described.

2. In a sewing machine in combination with the main shaft, a plurality of needles, and complemental stitch forming mechanism, a suitable rock shaft, connections between the main shaft and said rock shaft for oscillating the latter, a vertical shaft, a thread carrier driven from said vertical shaft, a gear on the lower end of said shaft, a thread carrier as G driven from said gear, and a universal joint connection between the rock shaft and said vertical shaft for transmitting movement to said thread carriers; substantially as described.

3. In a sewing machine in combination with the main shaft, a plurality of needles, and complemental stitch forming mechanism, a suitable rock shaft, connections between the main shaft and said rock shaft for oscillating the latter, a crank on said rock shaft, a link having ball and socket connection with the crank, a vertical shaft having ball and socket connection with the link, and thread carriers as F, G, driven from said vertical shaft; substantially as described.

4. In a sewing machine in combination with the main shaft, a plurality of needles, and complemental stitch forming mechanism, a rock shaft journaled in bearings on the frame, connections between the main shaft and the rock shaft for oscillating the latter, a crank on said rock shaft, a link having ball and socket connection with the crank, a vertical shaft having ball and socket connection with the link, a horizontal arm as R secured to said shaft, a thread carrier F attached to said arm, a segment secured to the lower end of said shaft, and provided with teeth, a horizontal arm R′ provided with teeth meshing with those on the segment and a thread carrier as G secured to said horizontal arm R′; substantially as described.

5. In a sewing machine in combination with the main shaft, a plurality of needles, and complemental stitch forming mechanism, a supplemental shaft provided with a gear driven from the main shaft, an eccentric attached to said gear, a rod driven thereby, a stud or bolt journaled in the end of said rod, a connecting link rigidly secured at one end to the stud or bolt, a rock shaft journaled in bearings on the machine frame and to which said connecting link is also rigidly attached, a crank on said rock shaft, a link having ball and socket connection with the crank, a vertical shaft having ball and socket connection with the link,

a horizontal arm as R secured to said shaft, a thread carrier F attached to said arm, a segment secured to the lower end of said shaft, and provided with teeth, a horizontal arm R′ provided with teeth meshing with those on the segment and a thread carrier as G secured to said horizontal arm R′; substantially as described.

6. In a sewing machine, in combination with the main shaft, and stitch forming mechanism, a rock shaft, connections between the main shaft and the rock shaft for oscillating the latter, a vertical shaft, a thread carrying device connected therewith, and a ball and socket and link connection between the rock shaft and the vertical shaft, forming a universal joint, whereby an oscillatory movement is transmitted to the thread carrying device; substantially as described.

7. In a sewing machine, in combination with the main shaft and stitch forming mechanism, a rock shaft, connections between the main shaft and the rock shaft for oscillating the latter, a vertical shaft, a thread carrying device connected therewith, and a universal joint connection between the rock shaft and the vertical shaft comprising a crank, ball and socket, link, and second ball and socket, whereby an oscillatory movement is transmitted to the thread carrying device, substantially as described.

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

LORENZ MUTHER.

Witnesses:
W. S. NORTH,
CHESTER MCNEIL.