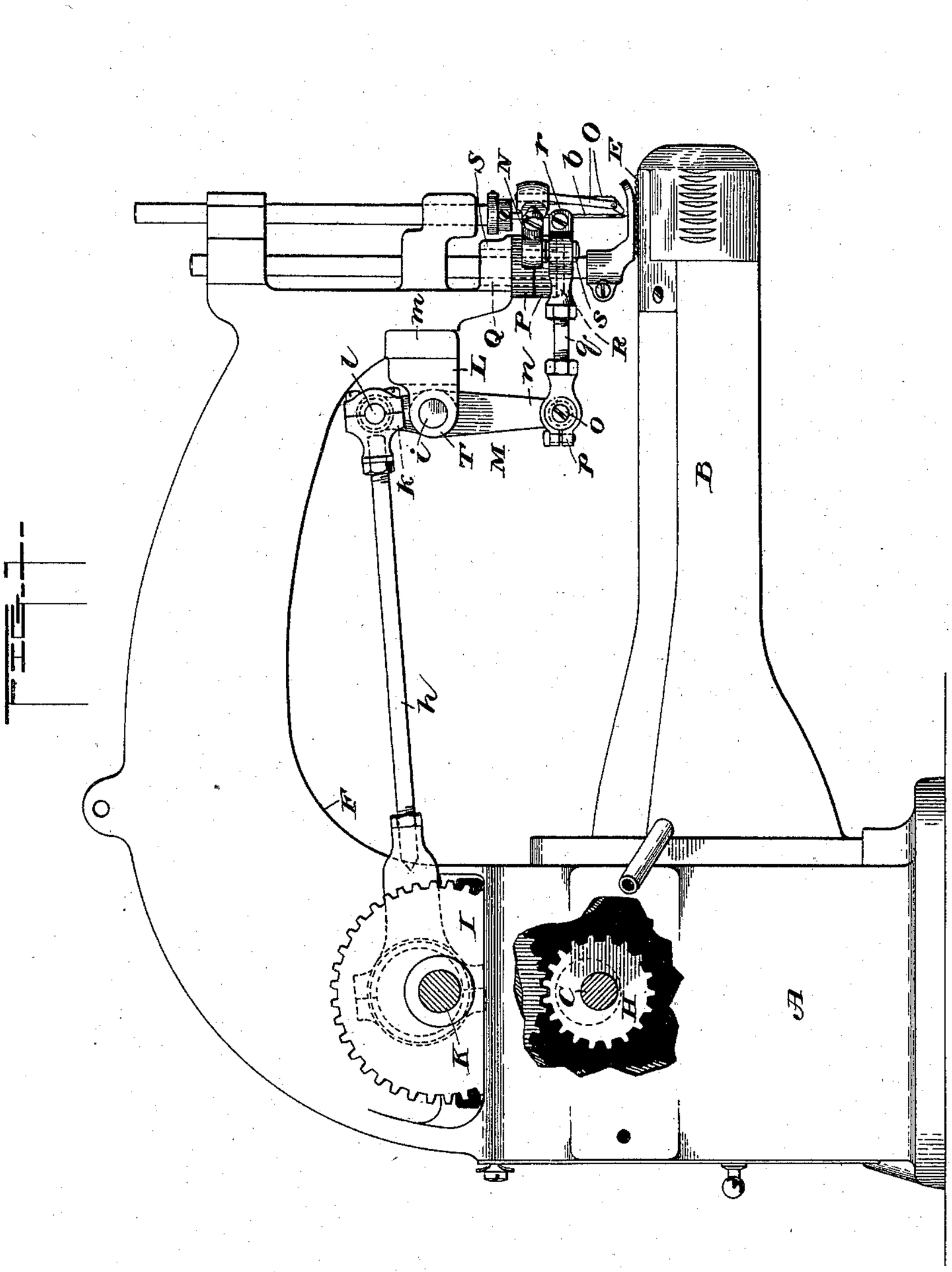
(No Model.) 5 Sheets—Sheet 1.

L. MUTHER & E. C. HOLLAND.

SEWING MACHINE.

No. 605,325. Patented June 7, 1898.



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(No Model.) 5 Sheets—Sheet 2.

L. MUTHER & E. C. HOLLAND.

SEWING MACHINE.

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FIG. 5.

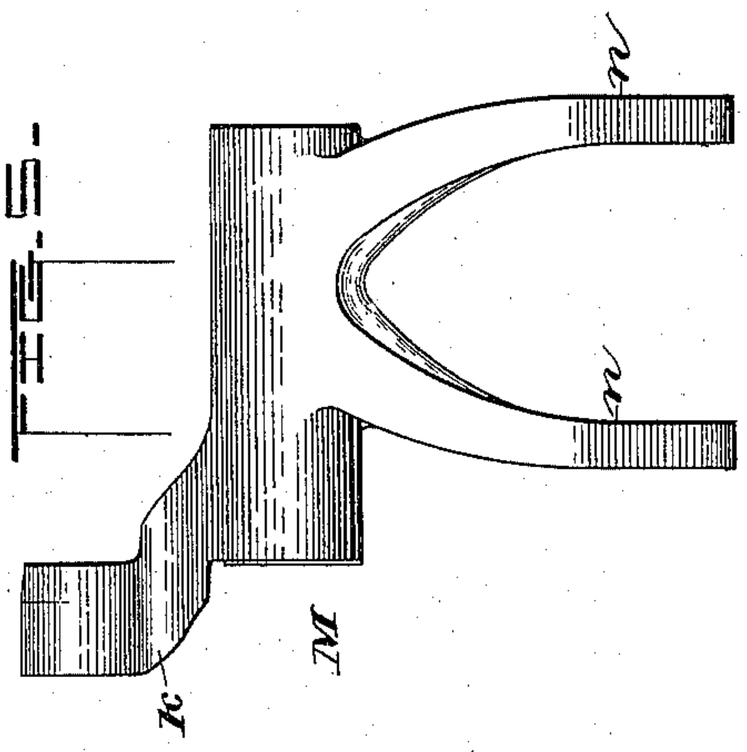


FIG. 6.

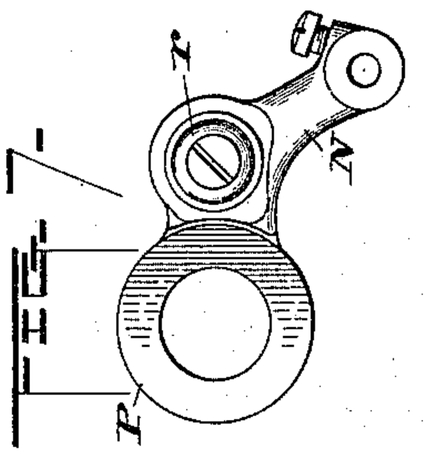


FIG. 6.

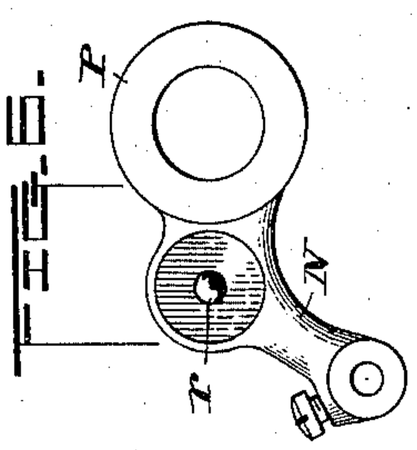
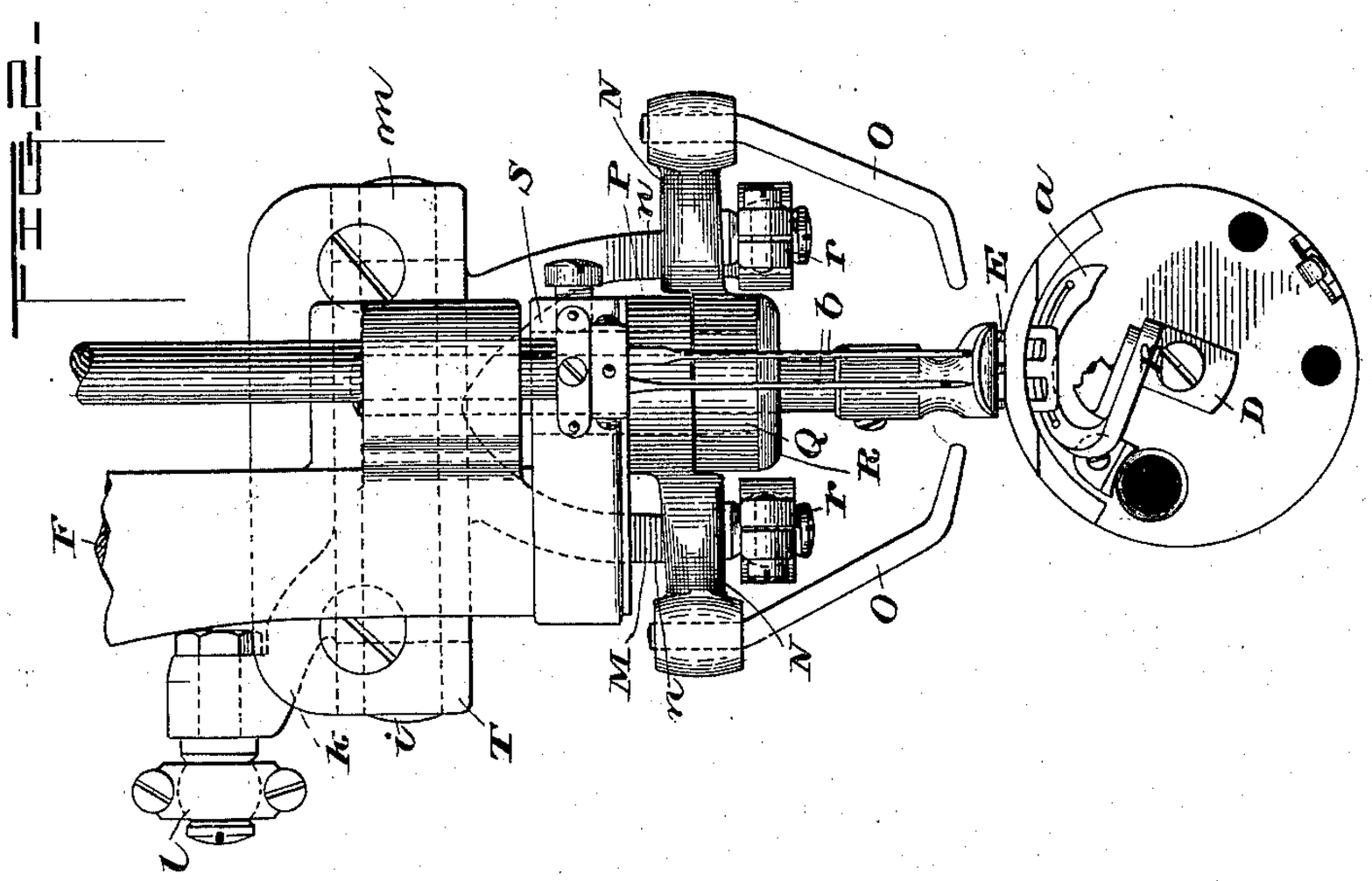


FIG. 2.



Witnesses
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(No Model.)

5 Sheets—Sheet 3.

L. MUTHER & E. C. HOLLAND.

SEWING MACHINE.

No. 605,325. Patented June 7, 1898.

FIG. 2.

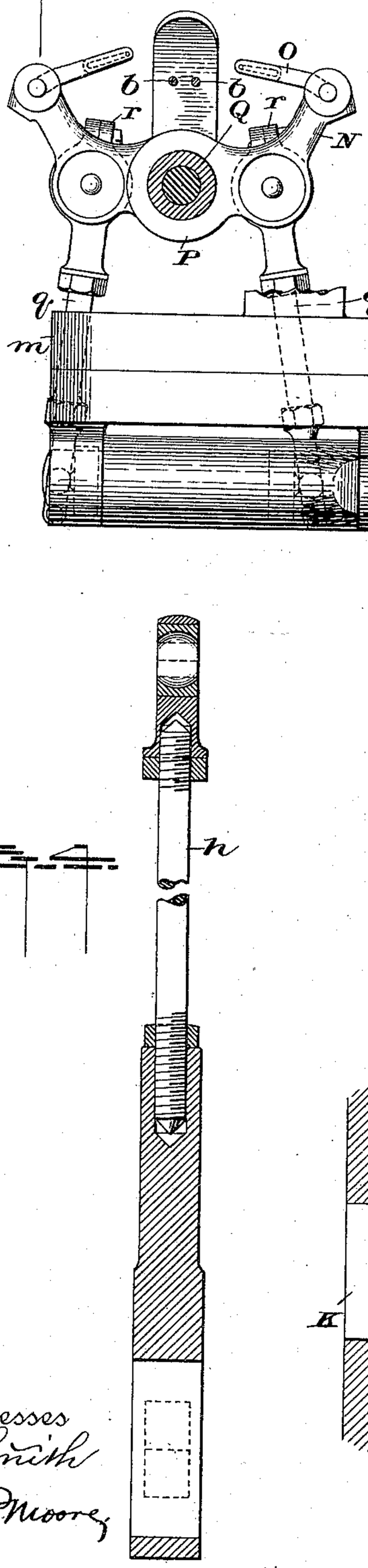

FIG. 1.

FIG. 3.

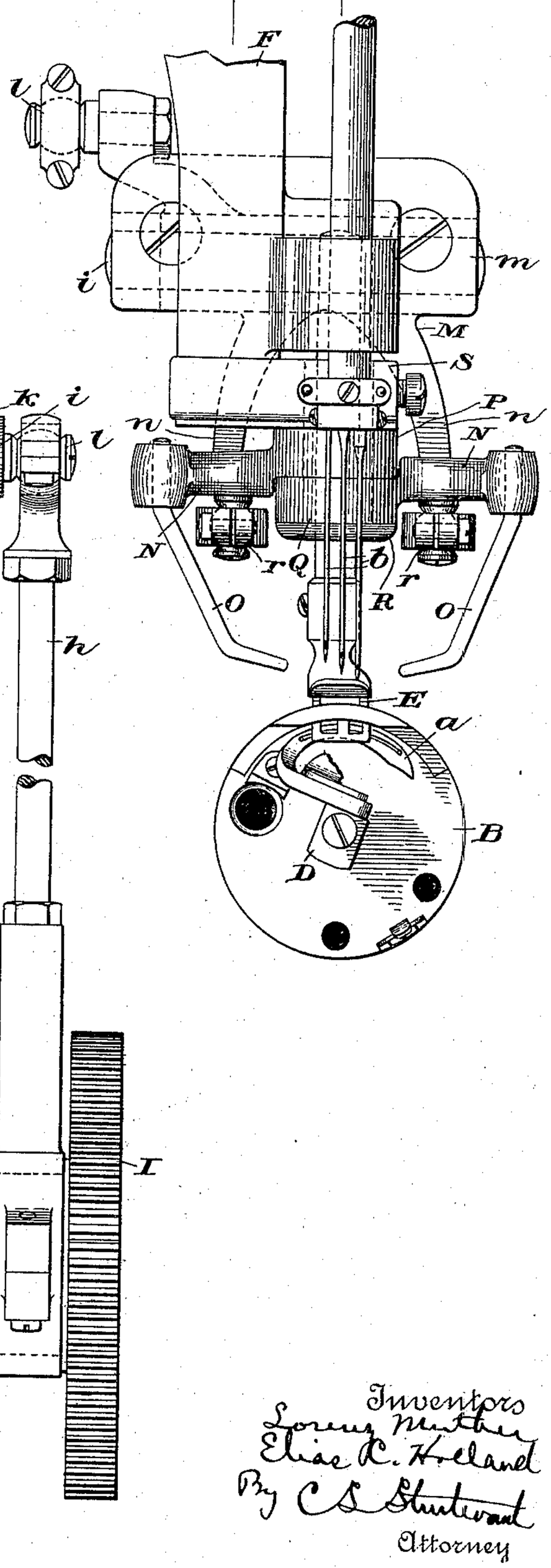

FIG. 4.

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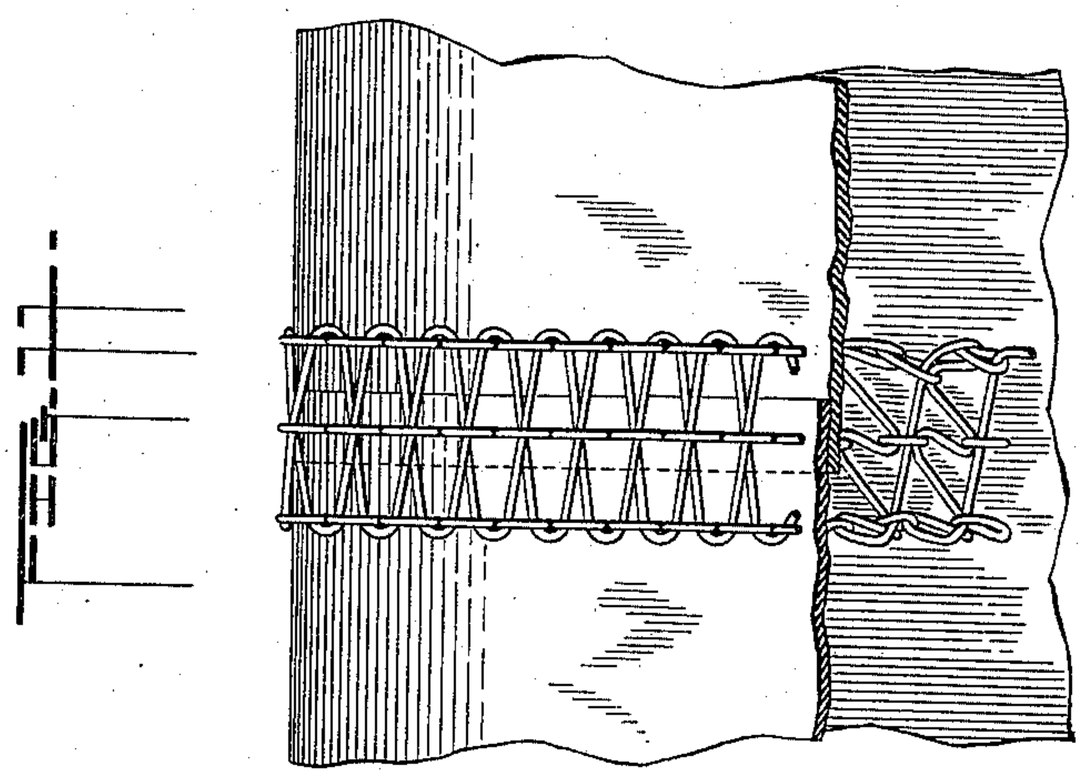
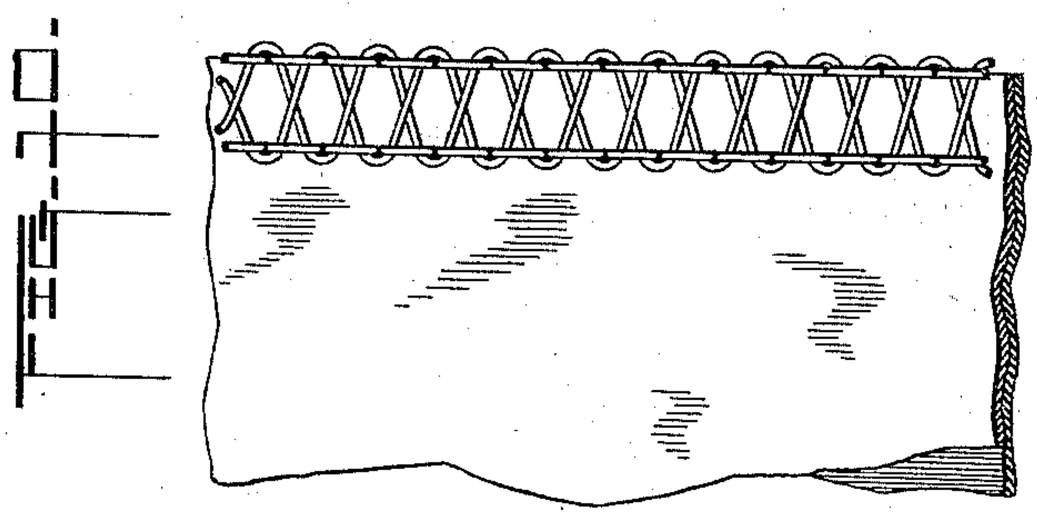
5 Sheets—Sheet 4.

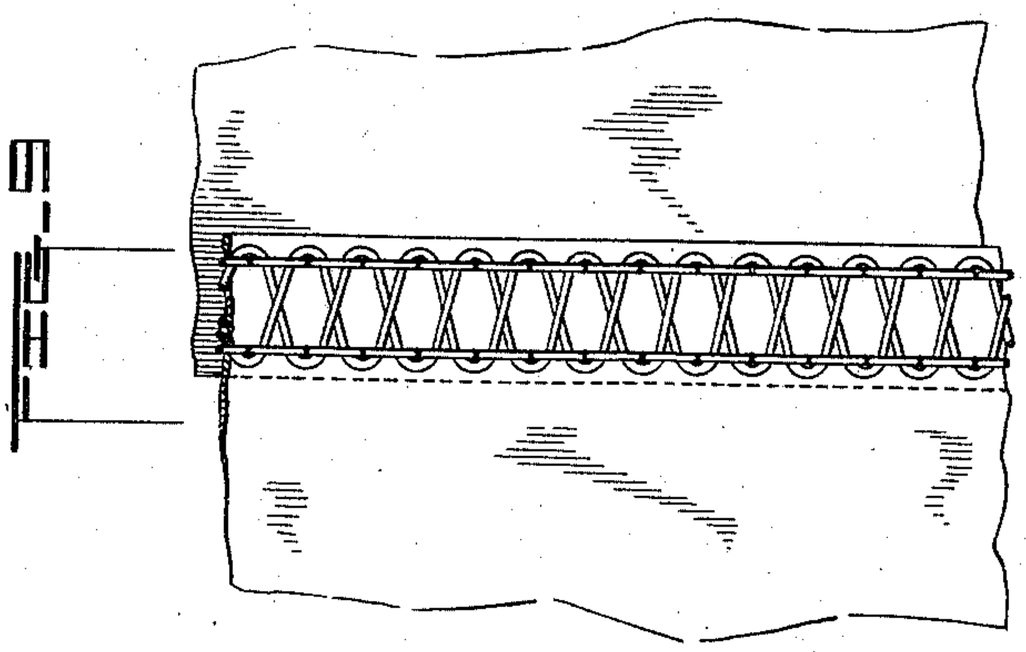
L. MUTHER & E. C. HOLLAND.

SEWING MACHINE.

No. 605,325. Patented June 7, 1898.







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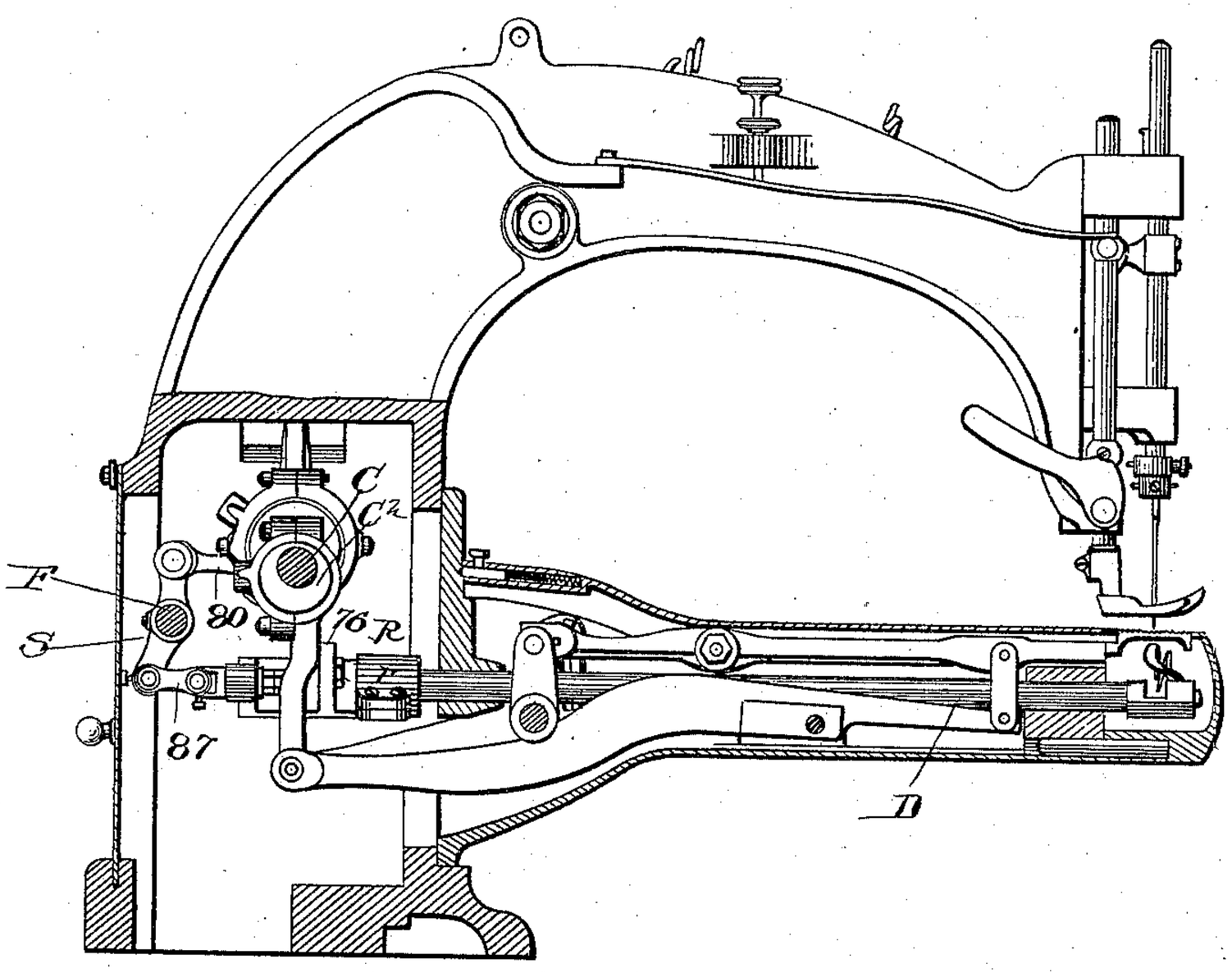
5 Sheets—Sheet 5.

L. MUTHER & E. C. HOLLAND.

SEWING MACHINE.

No. 605,325. Patented June 7, 1898.

Fig. 12.



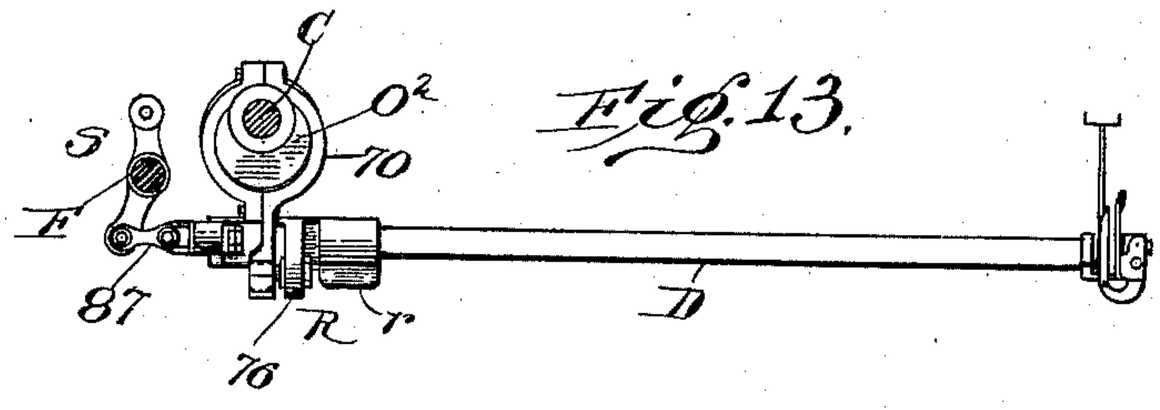


Fig. 13.

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Inventors:
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Elias C. Holland
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UNITED STATES PATENT OFFICE.

LORENZ MUTHER, OF OAK PARK, AND ELIAS C. HOLLAND, OF AUSTIN, ILLINOIS, ASSIGNORS TO THE UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 605,325, dated June 7, 1898.

Application filed February 26, 1896. Serial No. 580,809. (No model.)

To all whom it may concern:

Be it known that we, LORENZ MUTHER, residing at Oak Park, and ELIAS C. HOLLAND, residing at Austin, in the county of Cook, State of Illinois, citizens of the United States, 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.

Our invention relates to an improvement in sewing-machines, and especially to a machine in which the feeding mechanism works longitudinally of the bed-plate of the machine and in which also the shape of the bed-plate is that of a long narrow cylinder, whereby tubular goods may be fed thereon to the stitch-forming mechanism. Such a machine is very useful in uniting the edges of cut knit goods, for making an ornamental border on the edge of goods, or for many kinds of seaming and ornamenting. We know it to be old to feed tubes of knitted fabric longitudinally of the arm of a sewing-machine and to trim and then stitch by zigzaging a needle back and forth across the lines of the seam, and we do not claim such as our invention, for a machine constructed in that manner will not do the work done on ours and possesses many defects which it is our object to overcome.

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

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

Figure 1 is a side elevation of a sewing-machine embodying our invention. Fig. 2 is an end view. Fig. 3 is a top plan view, partly in section. Fig. 4 is a detail of the rod *u*. Figs. 5, 6, and 7 are detail views of the thread-carrier-operating devices. Fig. 8 is an end view of a three-needle machine; and Figs. 9, 10, and 11 are views of fabrics sewed on the two different kinds of machines. Fig. 12 is a sectional side view of a sewing-machine, showing the mechanism for giving the four motions to the looper; and Fig. 13 is a detail view of the same.

In the drawings, A represents the base or standard of the machine; B, the cylindrical bed-plate thereof; C, the main shaft, and D the looper rocker-shaft, which has both a forward-and-backward and an oscillatory movement.

E is the feed-dog, suitably operated from the transverse main shaft C to have a movement forward and backward longitudinally of the cylindrical bed-plate.

F is the gooseneck of the machine, *a* the looper, and *b* the needles.

The mechanism for oscillating and reciprocating the looper-shaft D is shown more especially in Figs. 12 and 13, the mechanism for oscillating the said looper-shaft comprising the crank connection R, formed with a split sleeve *r* at its inner end, within which split sleeve the end of the looper-shaft is rigidly clamped, this crank R having a lug 76, to which is attached by a ball-and-socket connection the lower end of the strap 70, which embraces the ball-eccentric O^2 on the main shaft C. The reciprocating movement is derived from an eccentric, (not shown,) which by means of a strap or collar (not shown) and connecting-rod 80 transmits motion to the crank S on the rock-shaft F, which at its lower end, by means of links 87, is attached to the rear end of the crank connection R. This is all as shown in Patent No. 583,415, granted May 25, 1897, to Muther, Woodward, and Holland.

The looper *a* carries an under thread and coöperates with the needles to form continuous rows of stitching, the lower thread passing back and forth and interlacing with the loops of needle-thread. We have combined with this apparatus two fingers, which reciprocate back and forth across the line of the seam and which carry threads or cords back and forth between the rows of stitching, being secured to the fabric thereby.

In Fig. 9 we have shown a fabric the edges of which have been overlapped and united by the mechanism shown in Fig. 1.

In Fig. 10 a fabric is shown with its edges ornamented with the seam formed by the mechanism shown in Fig. 1, and the fabric may be fed to the stitch-forming mechanism in a manner to make one row of stitches outside the edge, the cross threads or cords being laid

adjacent the edge, or both rows of stitches may be within the edge.

In Fig. 11 the edges of a tubular piece of goods are shown as having been slightly overlapped and fed to the stitch-forming mechanism shown in Fig. 8, the central row of stitches being made to pass through both thicknesses of goods, while the outer rows pass through single thicknesses, forming a flat, durable, and elastic seam and one in which the edges of the goods are practically selvaged and at the same time united.

As a further and special improvement in machines of this character we have devised a new and improved means for actuating the thread-carrying fingers, as follows: Arranged on the transverse main shaft of the machine is a gear-wheel H, adapted to mesh with a gear I on the stud K, fixed to the machine-frame. On the hub of the gear-wheel I is arranged a spherical eccentric, and through this eccentric and the connecting-rod *h* motion is transmitted to vibrate the thread-carrying fingers.

The gooseneck or head of the machine is provided with laterally-extending lugs *m*, to which is bolted a bracket L, having rearwardly and downwardly extending lugs T, through which passes a stationary pin or rod *i*. Sleeved on this pin or rod to have a rocking movement thereon is the crank-frame M, having the upwardly-extending lug or arm *k*, screw-threaded to receive a ball-stud *l*, over which the connecting-rod just fits, and by virtue of the spherical eccentric connection at the opposite end of the connecting-rod *h* perfectly free movement is provided.

Projecting downwardly from the crank-frame M are arms *n*, having ball-studs *o*, upon which fit the split collars *p*, adjustably attached to the short connection rods *q*, having at their opposite ends similar split collars *r* fitting the balls on the studs *s*, screwed into and projecting downwardly from the angle-arms N, to which the thread-carrying fingers O are attached. These angle-arms N are provided at one end with collars P, embracing the sleeve Q, having the head R on the lower end and secured at its upper end within the lug S on the head of the machine-frame. The collars P are supported on the sleeve Q between the lug S and the head R and by reason of the connections above described oscillate backward and forward, giving the desired movement to the thread-carrying fingers. The presser-foot bar of course freely reciprocates through the sleeve Q. By this construction it will be seen that a perfectly free system of joints between the thread-carrying fingers and the driving-shaft is provided, and the ends of the angle-arms N, to which the fingers are secured, are arranged to be in the same horizontal plane.

It will be understood that various minor modifications and changes in the construction of this mechanism may be made without departing from the spirit of our invention—as, for instance, the crank-frame M may have journals bearing in the lugs T instead of being sleeved on the pin or rod *i*, as shown.

A trimmer may also be applied to the machine in the usual manner.

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

1. A sewing-machine having a bed-plate, a feeding device working longitudinally thereof, stitch-forming mechanism including a looper-shaft arranged longitudinally of the bed-plate and having a reciprocating and oscillating movement therein, a looper on said shaft, a plurality of vertically-arranged needles, and a set of thread or cord guiding devices, reciprocating back and forth across the longitudinal axis of the bed-plate and depositing threads or cords in position to be secured to the fabric by the rows of stitching, substantially as described.

2. A sewing-machine having a bed-plate, a feeding device working longitudinally thereof, stitch-forming mechanism which includes a looper-shaft having a reciprocating and oscillating movement in the bed-plate, a vertically-arranged needle, a rocking shaft arranged transversely of the bed-plate and above the same and a set of thread-carrying devices operatively connected with the rocking shaft and adapted to reciprocate across the longitudinal axis of the bed-plate, with means for rocking said shaft, substantially as described.

3. A sewing-machine comprising a main shaft, a gear-wheel thereon, a gear-wheel in mesh therewith arranged on an axis parallel with the axis of the main shaft, a rocking crank-frame with its axis also parallel with the axis of the main shaft, universal-joint connections between the second gear-wheel and the rocking crank-frame, thread-carrying fingers, a connecting-rod between the fingers and the rocking crank-frame universally jointed at each end respectively to said frame and fingers; substantially as described.

4. A sewing-machine having a suitable head, a lug thereon, a sleeve secured in said lug, angle-arms with thread-carrying fingers secured at their outer ends and provided with collars embracing the sleeve and journaled thereon, and means for oscillating said angle-arms, substantially as described.

5. A sewing-machine having a suitable head, a lug thereon, a sleeve secured on said lug and having a head on its lower end, angle-arms with thread-carrying fingers secured at their outer ends and provided with collars embracing the sleeve and journaled thereon between the lug and the head, and means for oscillating said angle-arms, substantially as described.

6. A sewing-machine having a driving-shaft a suitable head, a lug thereon, a sleeve secured in said lug, angle-arms with thread-carrying fingers secured at their outer ends and provided with collars embracing the

sleeve and journaled thereon, said angle-arms being provided with downwardly-extending ball-studs, connecting-rods secured thereto, a rocking crank-frame arranged to swing on an axis transverse to the axis of the machine-frame and having ball-stud connections with the said connecting-rods, and connections between the rocking crank-frame and the driving-shaft; substantially as described.

7. A sewing-machine comprising a driving-shaft, a suitable stitch-forming mechanism and an overhanging frame or gooseneck, a bracket secured upon said frame or gooseneck, said bracket having downwardly-extending lugs, a pin or rod *i* secured to said lugs, a crank-frame sleeved on said pin or rod and having downwardly-extending arms *n* and an upwardly-extending lug or arm *k*, a connecting-rod attached to the arm *k* and connections between said connecting-rod and the driving-shaft for oscillating the crank-frame, connection-rods, as *q*, operatively connected with the downwardly-extending arms *n* and thread-carrying finger-supporting levers secured to said connection-rods *q*, substantially as described.

8. A sewing-machine having a bed-plate, a feeding device working longitudinally thereof, a looper-shaft arranged longitudinally of the bed-plate and having a reciprocating and oscillating movement therein, a looper on said shaft, and complemental stitch-forming mechanism which includes a device reciprocating back and forth across the longitudinal axis of the bed-plate to make a cross-stitch; substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

LORENZ MUTHER.
ELIAS C. HOLLAND.

Witnesses:
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CHESTER MCNEIL.