3 Sheets—Sheet 1.

T. A. MACAULAY.

Sewing Machine.

No. 86,848.

Patented Feb. 9, 1869.

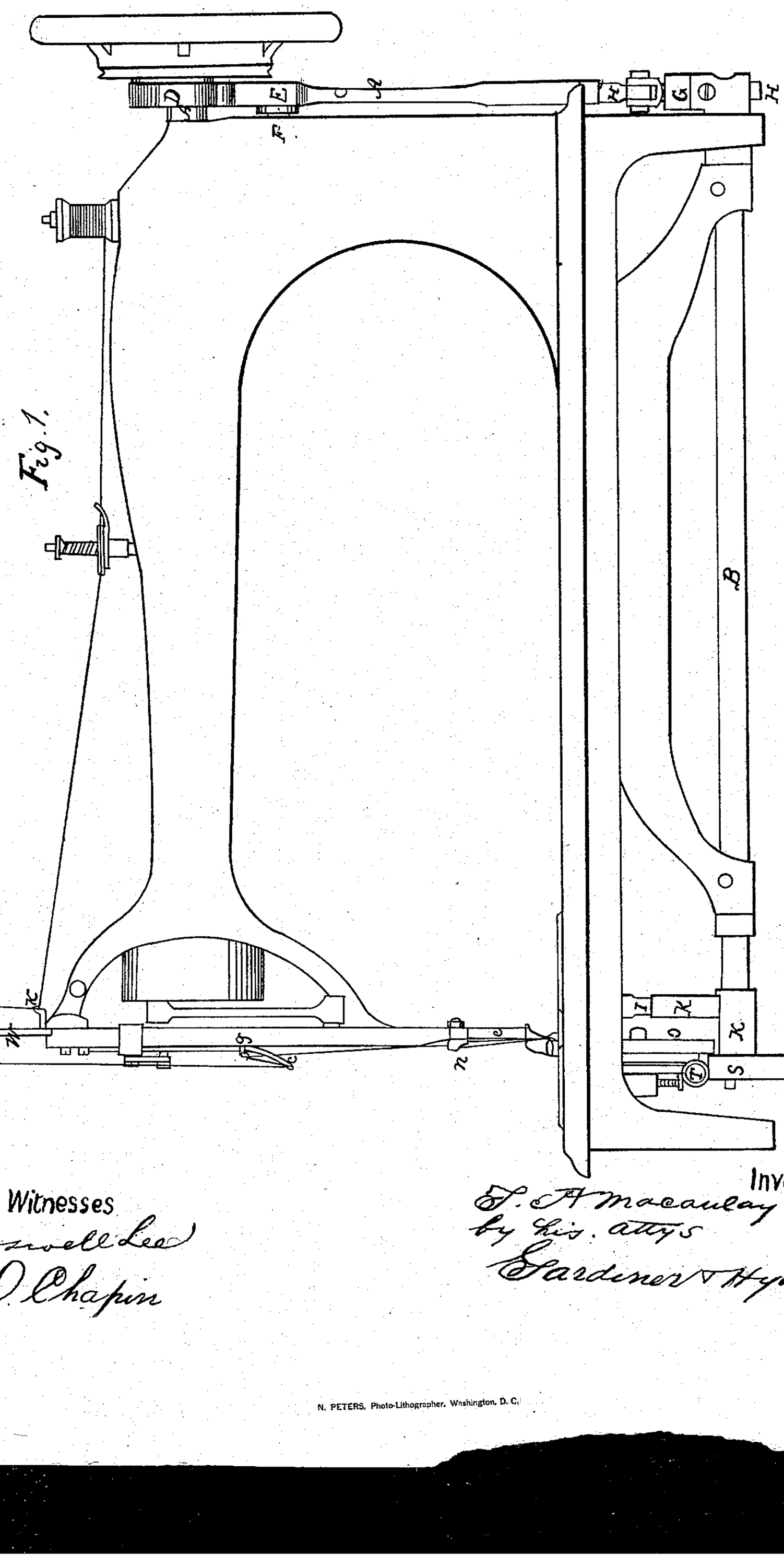

Fig. 1.

Witnesses

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Fig. 5.

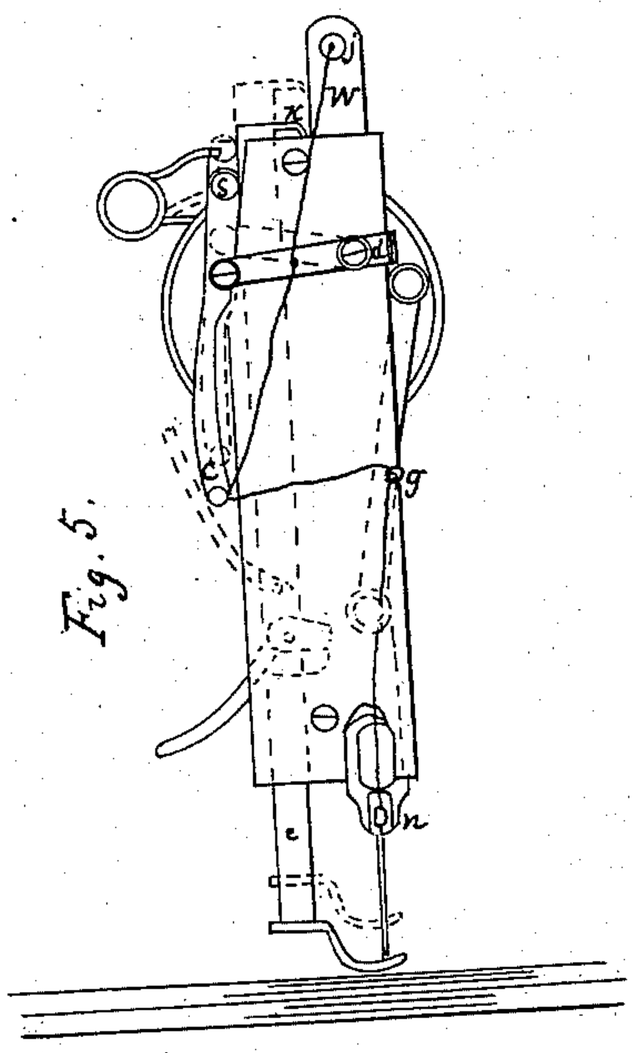

Fig. 3

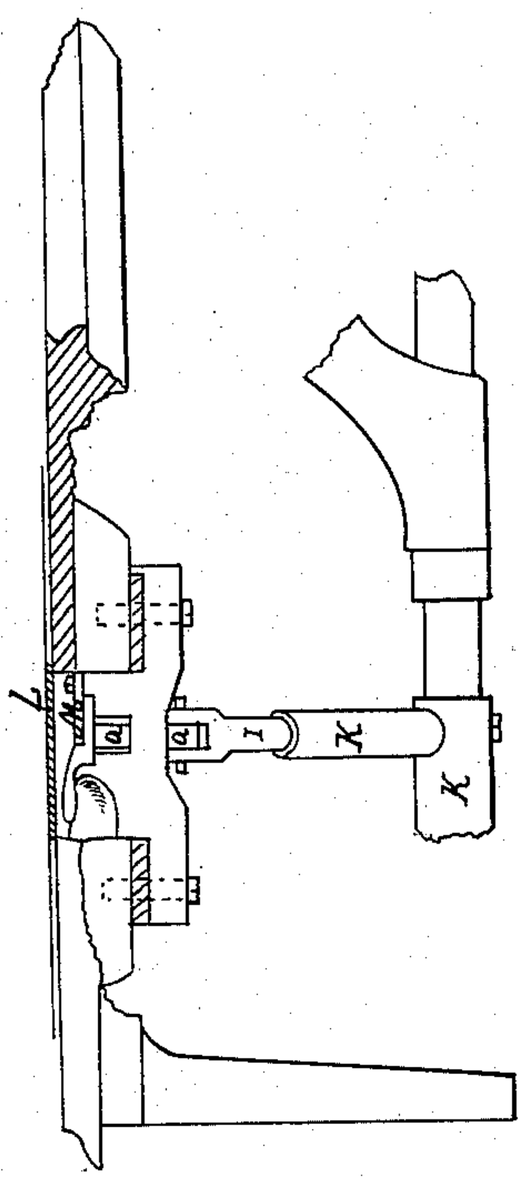

Fig. 2

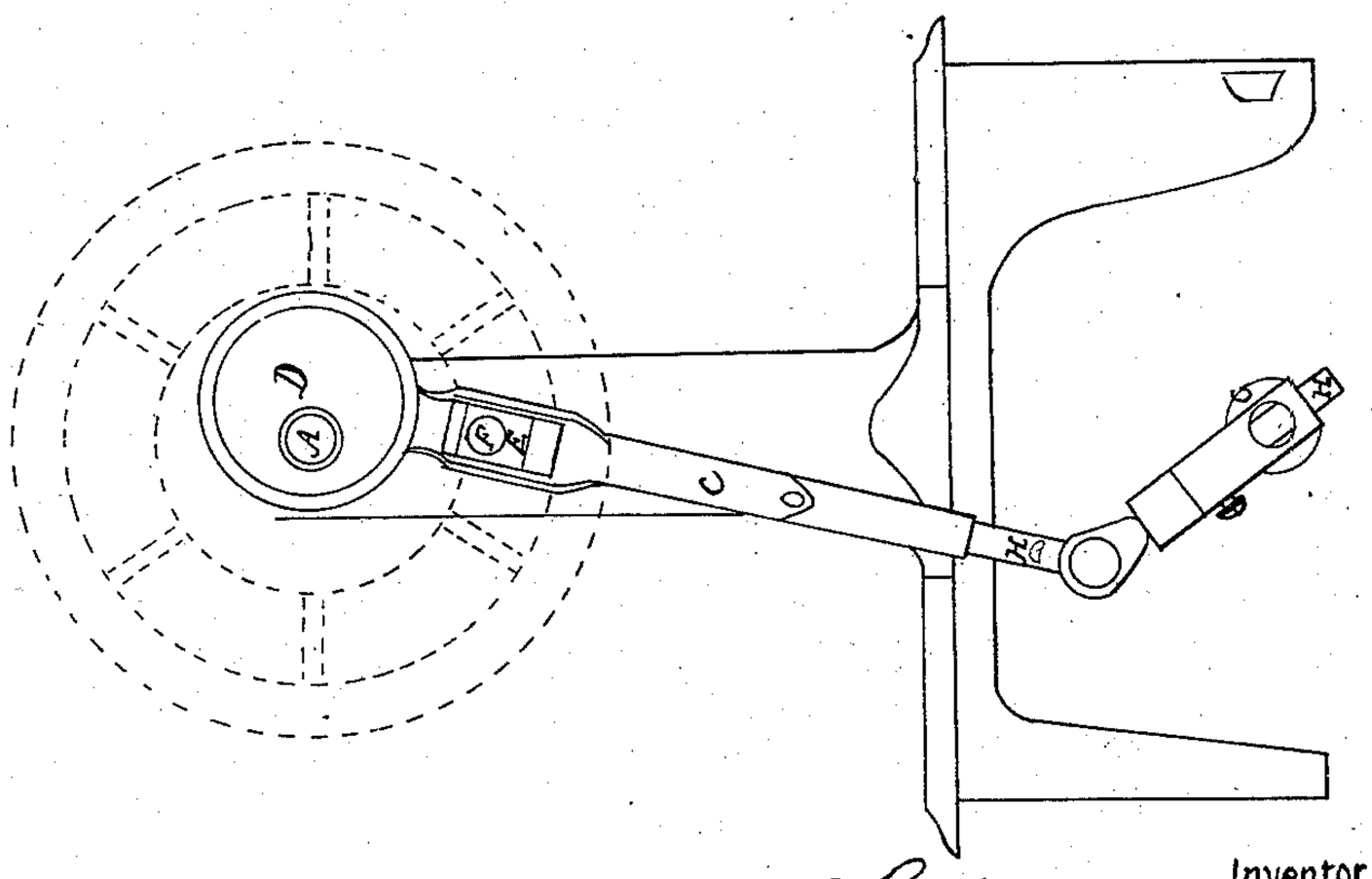

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Fig. 4

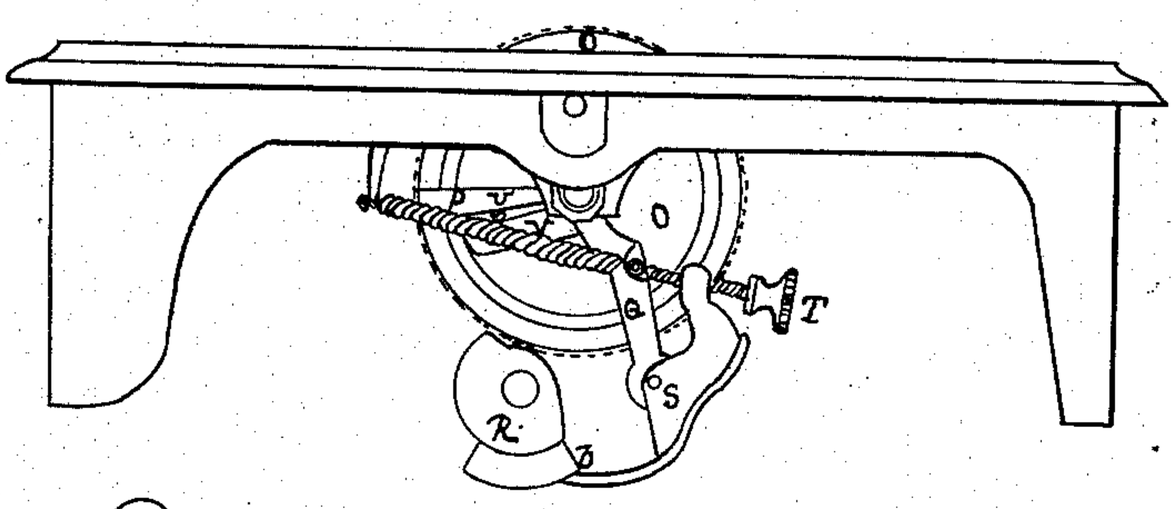


Fig. 7.

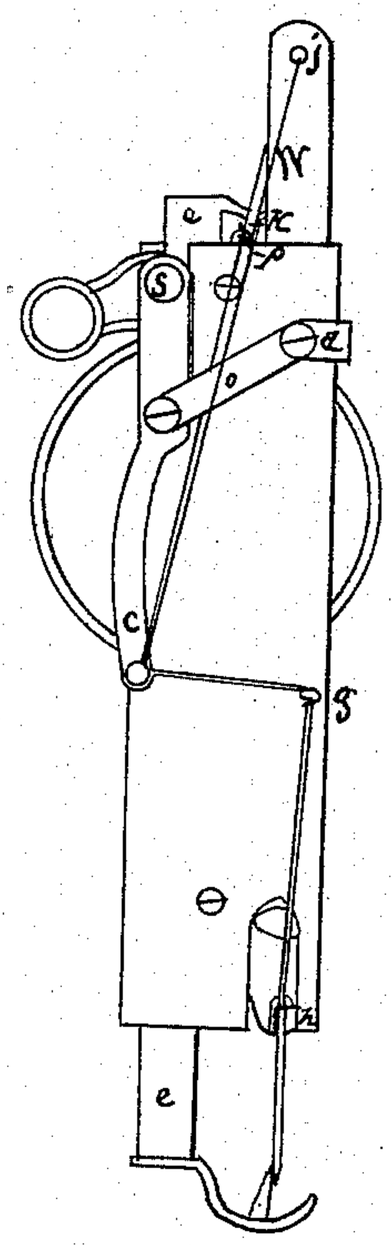
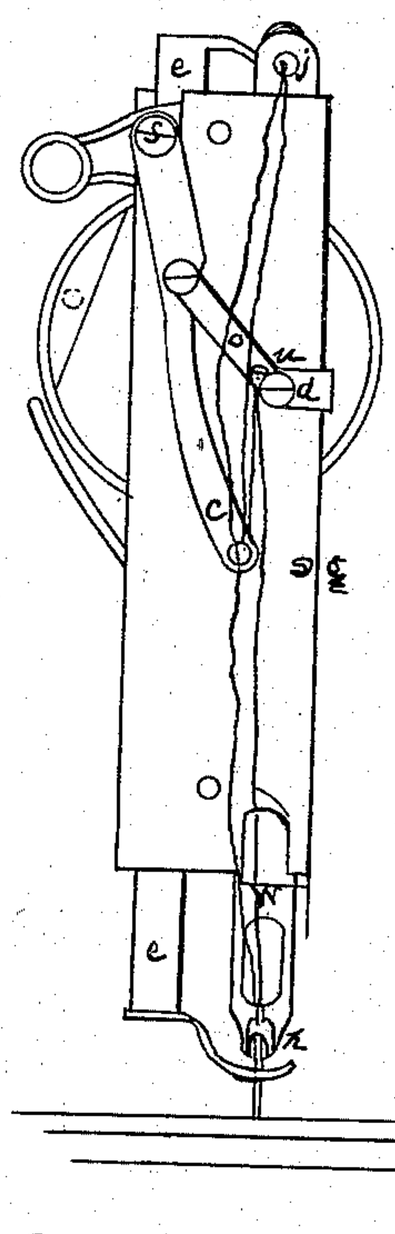


Fig. 6.



Witnesses:
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E. D. Chapin.

Inventor:
T. A. Macaulay
by his attys
Gardner & Hyde

UNITED STATES PATENT OFFICE.

T. A. MACAULAY, OF FLORENCE, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **86,848**, dated February 9, 1869.

To all whom it may concern:

Be it known that I, T. A. MACAULAY, of Florence, Hampshire county, Commonwealth of Massachusetts, have invented a new and useful Improved Sewing-Machine; and I do hereby declare that the following is a full and clear description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In the drawings, Figure I is a side view of my machine; and Figs. II, III, and IV are detailed views of parts of the same.

In describing my improvements I will enumerate them in order, and describe each one in its turn, referring to the drawings representing them. These improvements are adapted to that class of machines in which the rotating shaft is placed above the table, and operates a rocking shaft beneath the same; and first in order comes the means of connecting the rotating shaft A with the rocking shaft B, so as to give the latter the proper motion for driving the shuttle and feed.

In Figs. I and II it is seen that a rod, C, is connected with the rotating shaft A by means of an eccentric, D, upon the latter, placed at the end next to the pulley for driving it. This rod C is fulcrumed, at E, upon the elbow of the arm F, the said fulcrum being arranged so that it does not interfere with the vertical motion of the rod C, as it is operated by the eccentric on the main shaft. On the end of the rocking shaft B is a crank-arm, G, to which is joined a piston rod, H, the latter working in a piston-chamber made for it in the end of the rod C. By this means the desired rocking motion is given to the rocking shaft, for as the shaft A revolves the rod C rocks up and down by means of its eccentric connection, and at the same time oscillates on its fulcrum, operating the crank-arm G on the shaft B, the piston-connection giving room for the vertical play of the rod C.

The second point under consideration is the method of driving the shuttle by means of the connecting-rod I, operated by the rocking shaft B, so as to give the required motion to the shuttle-driver. This motion, it is well known, is simply a sliding one, and in order to impart it from the shaft B I use a piston-connection. The crank-arm K being rigidly fixed to the rocking shaft, while the rod I is a piston playing in a seat in the crank-arm, and jointed to the projection *a* on the lower part of the shuttle-driver, as the shuttle-driver slides from side to side of its bed, it passes directly over the rocking shaft, so that at either end of the slide it is farther from it. The piston-connection here compensates for the different degrees of distance, and adapts the length of the connections to suit them.

The slide for the shuttle-driver is constructed in a peculiar manner, as I will now show. Ordinarily the shuttle-driver was composed of two parts, one above the bed-plate having the horns, and the other a flanged sliding carrier. The two are connected by means of screws, and the flange of the carrier works on the under side of the race, while the propelling part of the horned plate works against the top of the race. In this class of machines both the bottom and top sides of the race must be planed true. I employ the usual horned plate, provided with a downwardly-projecting arm, that works freely in the slot of the race, and the bottom of this plate works on the planed top thereof, and is held in contact with it by means of a guide-plate, M, screwed down upon the driver-bed, so that the driver slides in between this plate M and its bed. By this means I save the labor of planing the lower sides of the bed-plate at the slot L, and make it parallel with the upper, and get rid of all work done in this respect underneath the bed-plate at this point.

The feed is obtained by the revolution of a wheel, O, upon the perimeter of which are the teeth for obtaining a hold on the under side of the cloth. This wheel O is operated by means of a friction-pawl, P, connected with a lever, Q, the latter being operated by the motion of a cam, R, on the end of the rocking shaft, as is common in wheel-feed machines. My improvements consist in the device for making the feed adjustable, so as to shorten or lengthen the stitch, as may be desired. In order to do this I place at the end of the lever Q, which is shortened for the purpose, another lever, S, pivoted, near the center, to the lever Q, so that one end is in contact with the cam R, and the other has a thumb-screw, T, bearing against the side of the lever Q, in such a manner that by turning it the relative positions of the two levers Q and S are altered, and the lever Q prac-

tically made longer or shorter, as the case may be. As seen by Fig. IV, from the peculiar construction of the cam, and the position of the bearing-point of the lever S, the farther this point is from the center of fulcrum of the lever Q, so much shorter is the stitch, and vice versa, the bearing-point of the lever S playing over the corner *b* of the cam. In this manner the lever operating the wheel is made adjustable of itself, so as to shorten or lengthen the stitch, as before stated, and this by means of merely turning the thumb-screw T either way, as required, thus dispensing with countershafts or adjustable cams.

In order to get a direct bearing for the spring U upon the pawl P I extend an arm, V, from the lever Q. Upon the end of this arm the spring U is placed, and presses directly against the pawl.

The thread-controller consists of a peculiar arrangement of levers in connection with both the foot-bar and needle-bar. Its connection with the foot-bar is such that when the same is raised for the working of thick cloth the take-up lever *c* describes a greater arc of circle, and slackens the thread more at the time when the shuttle is passing through the loop than is the case when the foot is only slightly raised for thin cloth. The take-up rod *c*, it will be seen, is immediately operated by the vertical motion of the needle-bar W, to which it is connected by means of the link *d*, and that the rod *c* is fulcrumed to the foot-bar *e* at *f*. Now, when the fulcrum *f* is higher, as is the case when the foot-bar *e* is elevated by the thicker stock, the needle-bar relatively descends lower, and draws the end of the take-up *c*, through which passes the thread, closer to the fixed guide *g*, leaving the slack between the guide *g* and guide *h* at the needle to be made into the loop.

Fig. V shows the foot-bar in one position for thin cloth, and the position of the take-up and other parts just as the eye of the needle is even with the top surface of the cloth, and when the slack of thread is required. The red lines show the same position of parts, with the difference only of the greater elevation of the foot, as occasioned by the working of thick stock.

The guide *g* may be dispensed with, if desired, as the near approach of the end of the take-up to the straight line between the guide *h* and the guide *j* on the needle-bar would leave the requisite slack at the same time. This is shown in Fig. VI.

The thread, passing from the tension device, first passes through a fixed guide, *k*, on the foot-bar; thence through the guide *j* on the upper end of the needle-bar W; thence through the end of the take-up *c*, and from that either through the fixed guide *g* or directly to the guide *h* near the needle.

Fig. VI shows another method of arranging the guide between the guide *h* and the end of the take-up *c*. In this it is seen that a guide, *m*, is placed upon the strap *o*, near the joint of the link *d;* and the approach of this guide and the end of the take-up as the needle-bar descends produces the slack.

Fig. VII shows another position of the fixed guide *k*. In this case it is fastened directly on the frame at *p*. This is desirable in some cases, as the thread is taken up a little sooner when the stitch is being closed by the raising of the needle-bar, the take-up remaining inactive until the stitch is completed.

Fig. VII shows a method of arranging the take-up without the use of the guide *j* on the top of the needle-bar. In this the thread passes directly from the guide *k* on the frame to the guide *g* on the frame, passing through the end of the take-up intermediately.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the rotating shaft A and rocking shaft B, of the connecting-rod C, piston-joint H, and crank, the parts being constructed and arranged substantially as herein shown.

2. The combination, with the shuttle-driver and its guide-plate M, of the piston-rod I and arm K, all constructed and arranged substantially as and for the purpose shown.

3. The combination, with the arm Q, pivoted to the axis of the feed-wheel, of the adjustable curved lever S and thumb-screw, all constructed and operating as set forth, to vary the length of the stitch.

4. The arrangement of the lever *c* in combination with the foot-bar, substantially as and for the purpose set forth.

5. The arrangement and combination of the fixed guide *k* on the foot-bar, guide *j* on the upper end of the needle-bar, lever *c*, link *d*, and guide *g*, substantially in the manner herein described.

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Witnesses:
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J. B. GARDINER.