I. P. HICKS.

Sewing-Machine.

No. 164,299. Patented June 8, 1875.

Fig. 1.

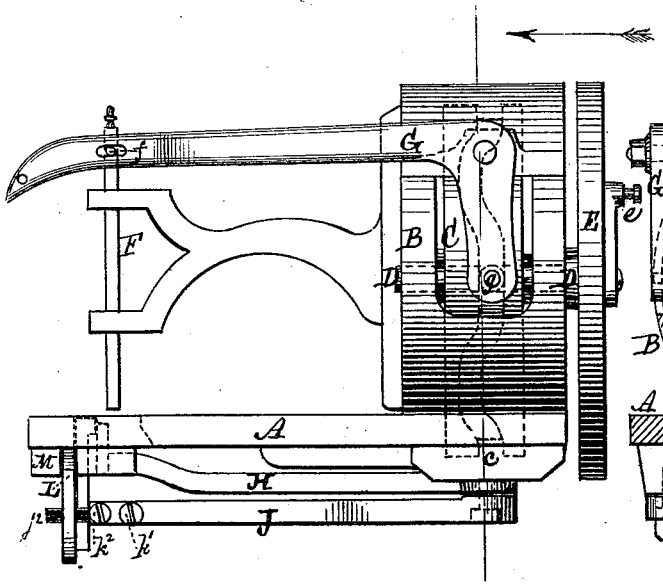


Fig. 2.

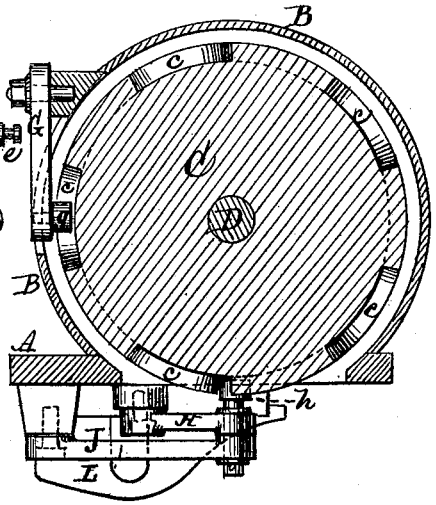


Fig. 3.

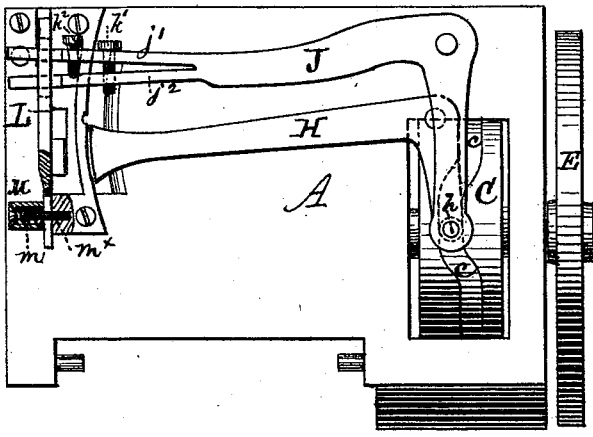
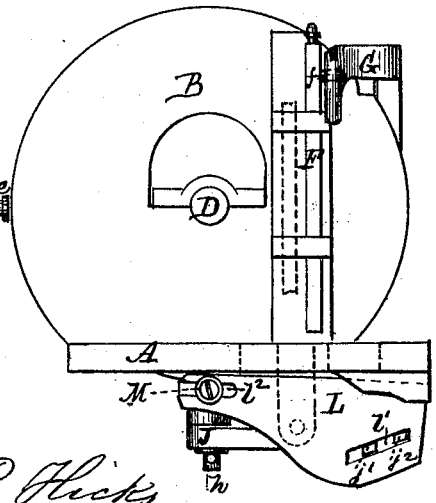


Fig. 4.



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UNITED STATES PATENT OFFICE.

ISAAC P. HICKS, OF PINE PLAINS, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **164,299**, dated June 8, 1875; application filed March 4, 1875.

To all whom it may concern:

Be it known that I, ISAAC P. HICKS, of Pine Plains, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, forming part of this specification.

My invention consists in a novel combination of a single-grooved cam and a series of levers, whereby the needle, the shuttle, and the feed are all operated by said single groove.

The invention consists further in a novel construction of the feed-bar lever, whereby the motion of the feed-bar is regulated, in order to govern the length of the stitch.

In the accompanying drawing, Figure 1 is a side view of my improved sewing-machine. Fig. 2 is a vertical section taken in the line *x x* of Fig. 1. Fig. 3 is a bottom view. Fig. 4 is a front view.

On the rear portion of the table A rests a frame or casing, B, in which works the cam C, the shaft D of said cam having its bearings in the sides of the casing, and carrying at its rear end a fly-wheel, E, provided with a crank-pin, *e*, for attaching the connecting-rod from the treadle. In the face of the cam C is a serpentine groove, *c*, having five turns or waves in each direction—that is to say, five toward the front and five toward the rear of the machine. To one side of the casing an elbow-lever, G, is pivoted, so as to oscillate in a vertical plane parallel with the axis of the cam. The long arm of this lever extends forward, and connects with the needle-bar F by a pivot, *f*, at its upper end. The short arm of the lever extends downward, and is provided with a stud, *g*, which extends inward and engages with the serpentine groove *c* in the cam C, so that as the cam revolves on its axis the lever G oscillates on its fulcrum. On the under side of the table A an elbow-lever, H, is pivoted, so as to oscillate in a horizontal plane. The long arm of this lever extends toward the front of the machine and carries the shuttle, and its short arm extends inward and is provided with a pin or stud, *h*, which engages with the groove *c* in the cam. A similar lever, J, is also pivoted on the under side of the table, so as to oscillate in a horizontal plane parallel with that of the lever H, but lower, so that the shuttle-carrying lever H works in a plane between the lever J and the under side of the table. The lever J has its fulcrum nearer the edge of the table than the lever H, and its short arm is longer than the short arm of said lever, and reaches to the end thereof, so that the pin *h*, which serves to give motion to the lever H, extends downward through the short arm of the lever J, connecting the ends of the short arms of both levers, and giving motion to both at the same time, but causing their long arms to travel different distances, owing to the difference in the location of their fulcrums. The long arm of the lever J extends toward the front of the machine, and operates the feed-bar. The outer portion of the long arm is forked or divided into two elastic branches, j^1 j^2, which pass through an inclined slot, l^1, in the feed-bar L. The elastic branches j^1 j^2 are provided with two set-screws, k^1 k^2, for expanding and contracting the width of the fork. The screw k^1 passes entirely through both branches, with its head resting against the outer side of the branch j^1, and its thread engaging with a thread in the branch j^2. The screw k^2 passes through only the branch j^1, with its thread engaging with a thread in said branch, and its point bearing against the inner side of the branch j^2. The fork is expanded by loosening the screw k^1, and then adjusting the screw k^2 to bear against the inner side of the branch j^2, and is contracted by loosening the screw k^2 and tightening up the screw k^1. The feed-bar L is attached to a suitable bracket or support on the under side of the table by means of a screw, $m^\times$, passing loosely through a slot, l^2, in the feed-bar, and entering the bracket. The outer portion of the screw $m^\times$ is surrounded by a spiral spring, *m*, the ends of which bear against the feed-bar and the head of the screw, which spring and screw-head are inclosed by a cap, M.

As the cam C revolves, the engagement of its serpentine groove *c* with the short arms of the elbow-levers G, H, and J imparts motion to the needle, shuttle, and feed, and the parts are so arranged with relation to each other that motion is imparted to each at the proper

time. There being five double curves to the cam-groove, one revolution of the cam produces five stitches; and, as the engagement of the needle-bar lever G with the cam-groove is at a point about one-quarter of a circle distant from the point of engagement of the shuttle-lever H and feed-lever J, the needle is always down when the shuttle goes through the loop, and always up when the feed carries the cloth forward. As the forks j^1 j^2 of the feed-lever move in the inclined slot l^1 toward the right hand in Fig. 4 of the drawing, the feed is depressed away from the cloth and carried backward; and, as the lever moves in the opposite direction, the feed is raised and carried forward so as to feed the cloth to the needle, the pressure of the spring *m* in the cap M being sufficient to prevent the feed-bar from moving forward until it has been raised to the proper horizontal position. The stitch is lengthened or shortened by adjusting the set-screws k^1 k^2, so as to expand or contract the width of the fork, and thereby regulate its motion in the inclined slot l^1, and the extent of longitudinal travel of the feed-bar consequent on such motion.

By using a double-pointed shuttle, this machine may be made to work in both directions.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination of the single-grooved cam C and the needle-lever G, shuttle-lever H, and feed-lever J, arranged and operating substantially as shown and described.

2. The combination of the lever J, divided into branches j^1 j^2, provided with the set-screws k^1 k^2, and the feed-bar L, having the inclined slot l^1, substantially as shown and described.

3. The combination of the cap M, spring *m*, and screw $m^\times$, with the feed-bar L, having the slot l^2, as shown and described, for the purpose specified.

ISAAC P. HICKS.

Witnesses:
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