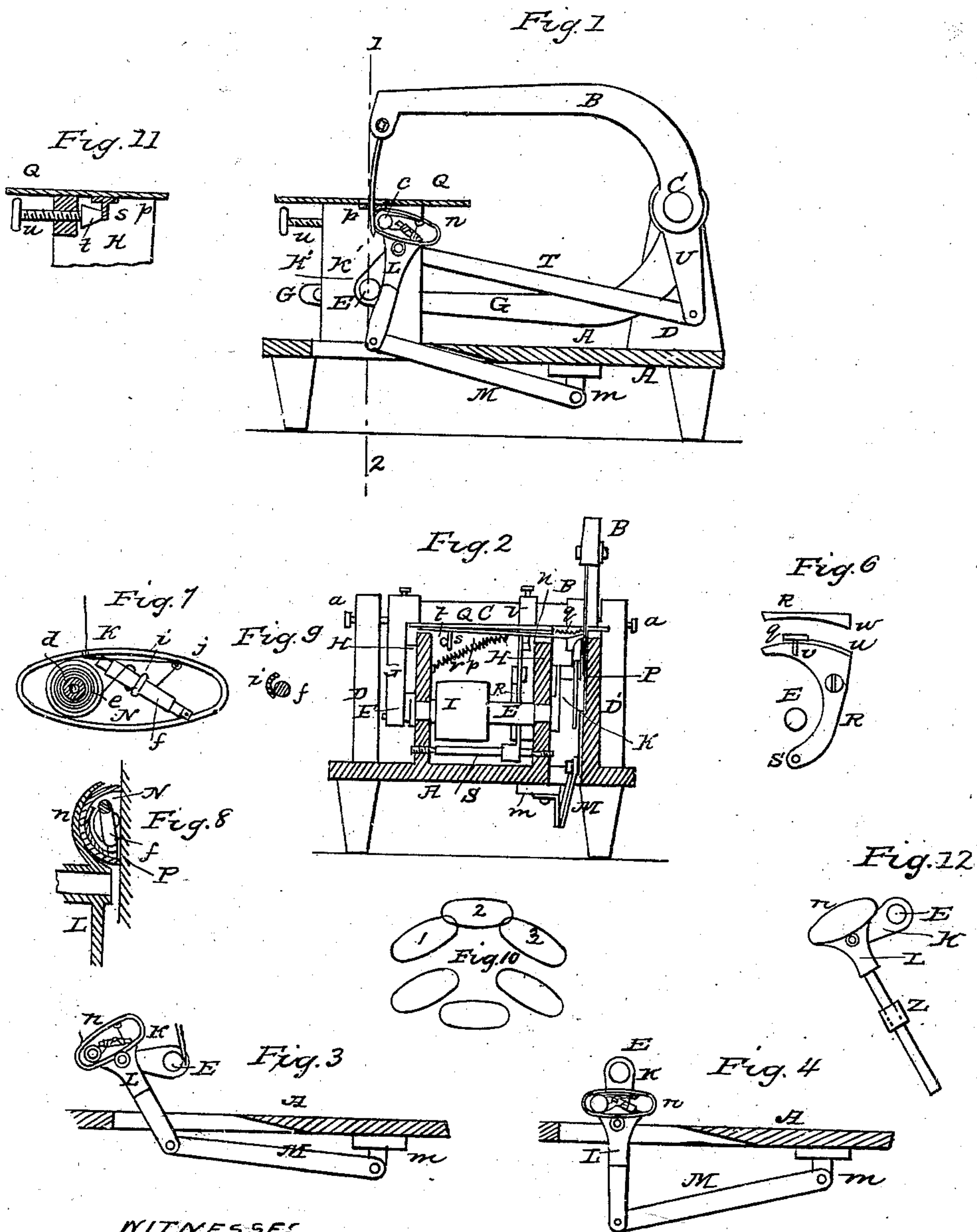


J. H. COOPER.
Sewing Machine.

No. 23,157.

Patented March 8, 1859.



WITNESSES
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JOHN H. COOPER, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 23,157, dated March 8, 1859.

To all whom it may concern:

Be it known that I, JOHN H. COOPER, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in sewing-machines for producing the ordinary lock-stitch; and my improvement consists in operating the shuttle of a sewing-machine by attaching its holder to an arm or carrier or carriers operated by a rotating crank and guided by a vibrating arm or its equivalent, the whole of these parts being arranged for joint action, substantially as described hereinafter.

In order to enable others skilled in this class of machinery to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of a sewing-machine illustrating my improvements; Fig. 2, a transverse section on the line 1 2, Fig. 1; Figs. 3 and 4, detached sectional views, showing the shuttle and its appliances in different positions; Figs. 5 and 6, a side view and plan of the vibrating feeding-arm; Fig. 7, an enlarged view of the shuttle; Fig. 8, a transverse section of the shuttle and its holder; Fig. 9, a section of the tension-spindle of the shuttle; Fig. 10, a diagram illustrating the different positions assumed by the shuttle; Fig. 11, a detached section of part of the machine, illustrating the device for regulating the length of the stitch. Fig. 12, a modified device for guiding the lower end of the shuttle-arm.

Similar letters refer to similar parts throughout the several views.

A is the base of the machine; B, the needle-arm, secured to a shaft, C, which vibrates on the points of studs *a a*, the latter being screwed into the standards D and D' on the base A. (See Figs. 1 and 2.) A vibrating motion is imparted to the shaft C by a crank, F, on the end of the shaft E, the pin of the crank fitting into the slotted end of the arm G, which is secured to the shaft C. The shaft E turns in the two standards H and H' on the base A, and

is furnished with a pulley, I, the latter being driven by a belt which passes round the driving-pulley of the machine.

To the shaft E, and outside the standard H', is secured a crank, K, the pin of which passes through and is connected with the shuttle-arm L, the lower end of which is jointed to the arm M, the latter being hung to a bracket, *m*, which is secured to the under side of the base A.

On the top of the shuttle-arm L is the shuttle casing or holder *n*, which is adapted to receive the shuttle N. (Seen in Fig. 8.) This shuttle, which will be best observed on reference to Fig. 7, is of an oval form, rounded at the back and open in front, the edges being nearly in contact with the smooth inside face of the plate P, Fig. 2, which is secured to or forms a part of the base A, so that the shuttle is retained within its holder by this plate.

To a pin, *d*, projecting from the shuttle, is hung the bobbin *e*, the thread from which passes over a spindle, *f*, looped onto a hook, *i*, on the said spindle, passes under the latter, thence through an eye, *j*, on the inner edge of the shuttle, and thence through a hole, *k*, to the fabric. The opposite ends of the spindle *f* turn in bearings in the shuttle, and one end of the spindle is so formed as to be readily turned by any suitable instrument.

Q is the cloth-plate, secured to the standards H and H', and beneath this plate slides a bar, *p*, the extreme end of which has a roughened or notched surface, *q*, arranged to move both vertically and horizontally in an opening in the cloth-plate, as described hereinafter.

A spiral spring, *r*, is connected at one end to the standard H and at the opposite end to the feed-bar *p*, and from the latter projects a pin, *s*, which the spiral spring tends to force against the cone-shaped end of the rod *u*, which screws into a projection on the standard H, as seen in Fig. 11. A spindle, S, turns on pins screwed into the standards H and H', and to this spindle is secured the arm R, to which a vibrating motion is imparted by an arm, U, on the shaft C, through the medium of the connecting-rod T. The upper edge of this arm R has a vertical swell or projection, which bears against the under side of the bar *p* and tends to raise the latter during a portion of its movement, the bar falling by the action of the spring *r* as the projection recedes. On the upper edge of the arm there is also an inclined lat-

eral projection, w , which bears against a pin, v , on the under side of the bar p , and thus moves the latter forward, the spring r moving it back as the lateral projection w recedes.

The plate P , against which the shuttle operates, may be furnished with a sliding panel, the removal of which will enable the operator to withdraw the shuttle from its race when necessary.

A rotary motion being imparted to the shaft E , the following movements will take place: first, the necessary vibrating motion of the needle-arm B , caused by the action of the crank F on the shaft G through the intervention of the slotted rod G ; second, the peculiar traversing motion of the shuttle, as seen in Fig. 10, effected by the crank K and guided shuttle-arm L ; third, the combined vertical and horizontal motion of the notched end of the feed-bar p , caused by the vibrating arm R and its vertical and lateral inclined projections.

The spool of needle-thread may be arranged in any desirable position on the machine, and as any of the modes now used of imparting tension to the needle-thread may be applied to my improved machine further allusion to them will not be required.

The method of effecting the stitch also will be so readily understood from the drawings by those skilled in this class of machinery as to render a detailed description unnecessary.

It will be observed, on reference to Fig. 10, that the shuttle revolves in an oval path, or in a path approximating to an oval. This is owing to the position of the pin of the crank K in respect to the shuttle and to the guiding of the lower end of the shuttle-arm L . It is not absolutely necessary that the shuttle should traverse in this oval path, although I prefer it for reasons given hereinafter. The pin of the crank might be loosely connected to the rear of and

to a central point in the shuttle-holder, in which case the shuttle would travel in a path nearly circular.

The arrangement shown in the drawings has the following advantage: The inclined position of the shuttle (marked 1 in Diagram 10) is an advantageous one for entering the loop of the needle-thread, and the similar inclined position 3 is an equally advantageous one for leaving the loop of needle-thread. By this peculiar arrangement, too, another important advantage is obtained, which is that the upper half of the shuttle's traverse is quicker than the lower half, and consequently the shuttle passes rapidly through the loop of needle-thread, enabling me to use a regular reciprocating motion for the needle-arm, instead of the usual irregular motion imparted by the ordinary irregular and noisy cams.

Instead of guiding the lower end of the shuttle-arm L by means of the arm M , the lower end of the arm may pass through a guide, z , which is so hung to the frame as to adapt itself to the different positions of the arm.

I claim and desire to secure by Letters Patent—

The combination of the shuttle N , shuttle-holder n , arm L , crank K , and arm M or its equivalent, when the said holder n is attached to or forms a part of the arm L , when the latter is carried by the crank K , and when the whole of the parts are arranged for joint action substantially as and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN H. COOPER.

Witnesses:

HENRY HOWSON,

CHARLES D. FREEMAN.