H. W. Dopp.

Sewing Machine.

No. 27279 Patented Feb. 28, 1860.

Fig. 4.

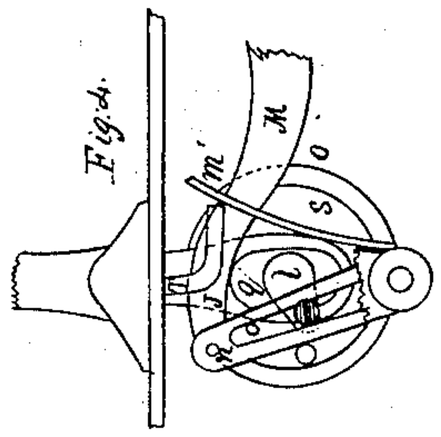


Fig. 5.

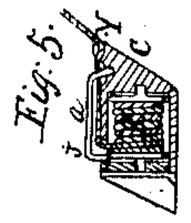


Fig. 3.

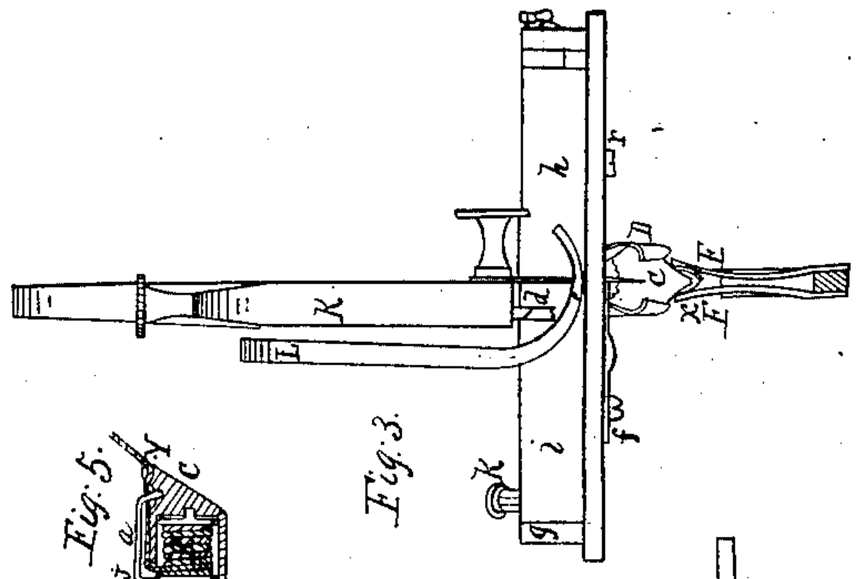


Fig. 6.

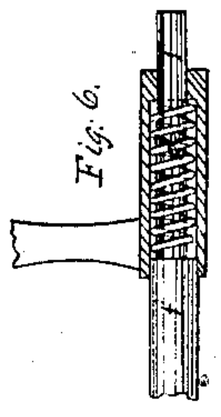


Fig. 2.

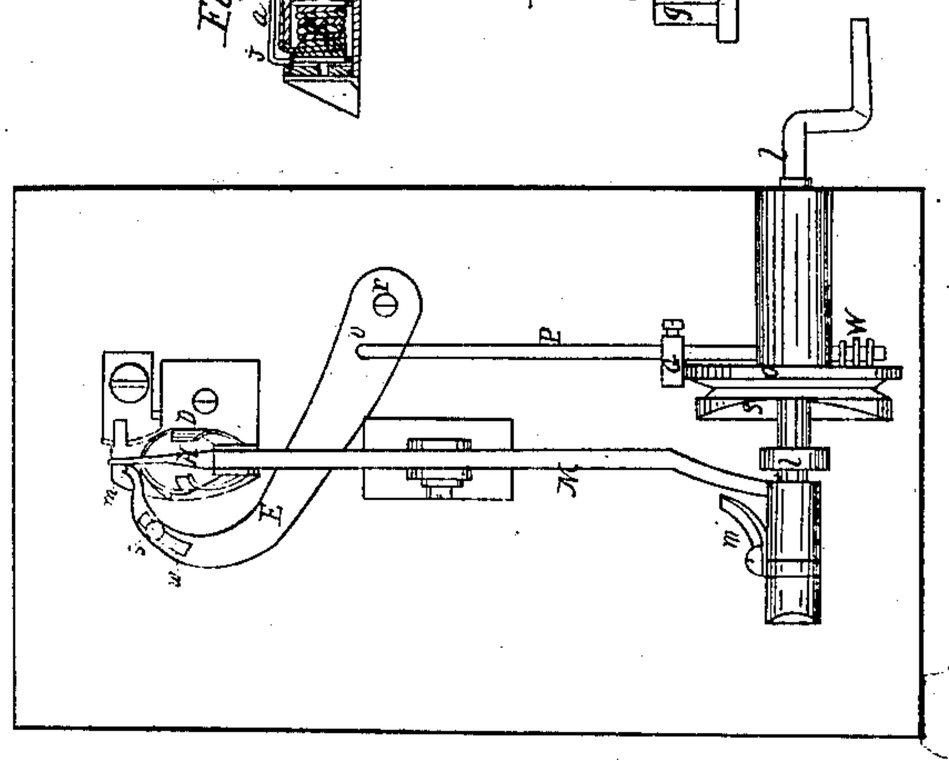


Fig. 8

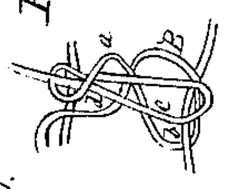


Fig. 9.

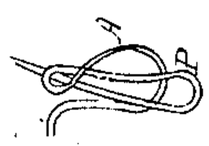


Fig. 7.

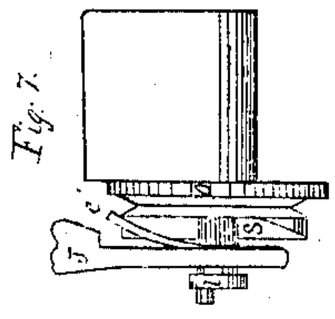
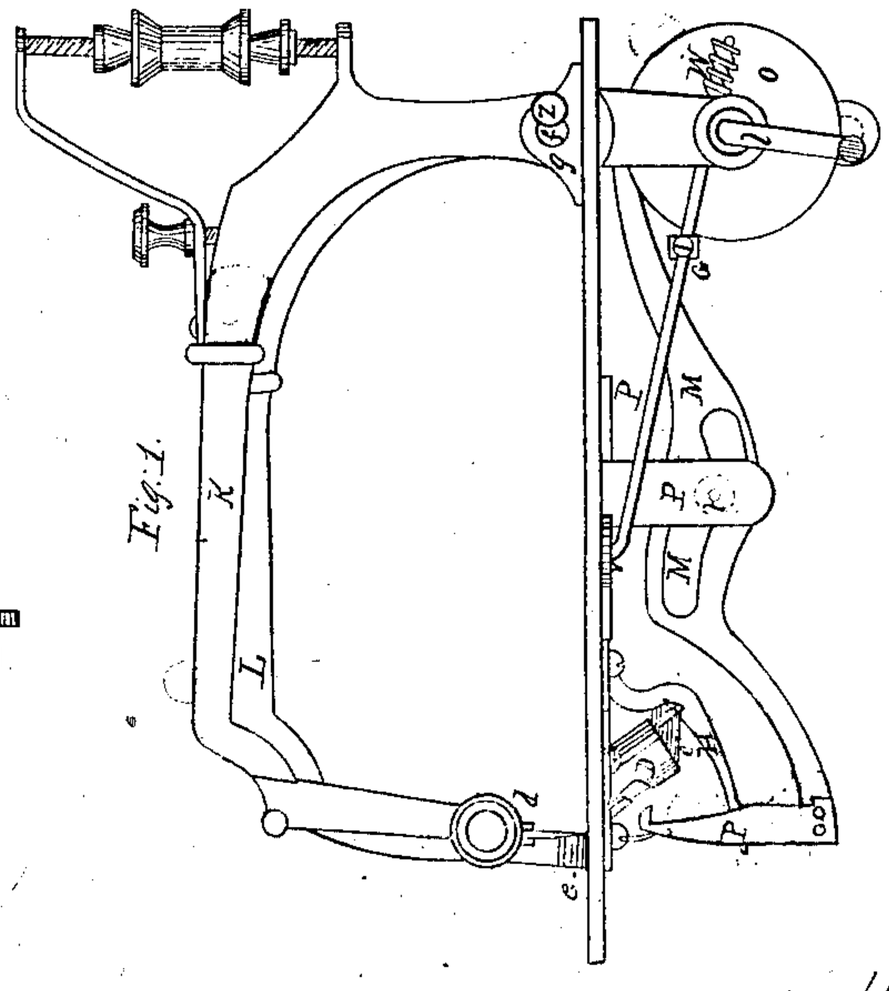


Fig. 1.



Witnesses.

Wm Alexander
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UNITED STATES PATENT OFFICE.

H. WILLIAM DOPP, OF BUFFALO, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **27,279**, dated February 28, 1860.

To all whom it may concern:

Be it known that I, H. W. DOPP, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a side elevation of a sewing-machine embracing my improvements. Fig. 2 represents a plan of the under side of the same. Fig. 3 represents a front elevation of the same without the working part, showing the looper spread open over the wedge-shaped prong on which the shuttle rests. Fig. 4 represents a side elevation of the working parts detached from the machine. Fig. 5 represents a longitudinal section through the center of the shuttle, showing the bobbin therein. Fig. 6 represents a longitudinal section through the pipe-box of the needle-arm, showing the shaft or bolt on which it turns, and the sprial spring that moves the arm laterally on said bolt or shaft. Fig. 7 represents a front elevation of the cam-wheel and bracket in which it has its bearing, and the end of the needle-arm with the spring *c'* bearing against the cam by which the arm is moved outward. Fig. 8 represents the formation of the stitch, showing the shuttle-thread which preserves the twist in the loop after it is crossed to receive the succeeding loop. Fig. 9 represents the same, showing the first loop partially drawn up around the succeeding one without the shuttle-thread.

The nature of my invention consists, first, in combining a stationary bobbin-case, certain hook-stretchers, and a thumb and finger in such a manner that the needle-thread will be crossed after it has passed over the bobbin, so that the needle may pass down into this cross or loop of its own thread at each subsequent downward movement for the purpose of running the under thread in a spiral form through a loop-stitch, as will be hereinafter described.

It also consists in the employment of a yielding tooth in combination with a vibrating bar when used as a relief-feed, as will be described.

In the accompanying drawings is represented a sewing-machine embracing my improvements, consisting of a table, A, and the working and stationary parts it supports. The general arrangement and construction of this machine are similar to those in common use, and therefore my description will be confined more particularly to the improvements I desire to secure by Letters Patent.

The needle-arm K and the arm L, whose front end forms the pressure-pad *e*, are connected at the rear of the table by means of a bolt, *f*, having its bearings in brackets *g g*, raised on either side of the table. These arms are provided with pipe-boxes *h i*, through which said bolt passes. The one, *i*, is confined to the bolt by a screw, *k*, and turns with it. The other one, *h*, turns on the bolt when it is held stationary by the arm L. The rear end or elbow, J, of arm K extends below the table, and is operated by crank *l*, working in an oval-shaped slot, *q*, with which it is provided. The rear end or elbow, T, of arm L also extends below the table, and is forced backward by a spring, *m'*, so that the pressure-pad on its opposite end is held against the bed-plate, and is pushed forward, so that the pressure-pad will be raised by a short arm, *n*, which is operated by the crank *l*, working in a long straight slot, *o*, and is connected and gives motion to the crooked arm M, to which the spreading-looper is secured. This arm M is provided at its center with a curved slot, N, through which it is connected to a bracket, *p*, projecting from the bottom of the table by means of a short screw-bolt furnished with a friction-roller, *t*, on which the top and bottom of said slot bear when in operation, and the arm M is thus guided upward and downward as it is drawn back and forth by the crank.

The curved arm E, which is provided with a thumb and finger, *m*, whose office is to cross one side of the loop over the other after it is formed, is pivoted to the bottom of the table at the point *r*, about which it turns, and is supported near its opposite end by the head of screw *s*, which passes through the curved slot *u*. Motion is given to this arm by means of the cam-wheel O through a rod, P, which is connected at one end to said arm at the point *v*, and is provided with a dock or shoulder, G, secured to it against the cam by a screw. The opposite end of this rod passes through and extends beyond the bracket in which the shaft of the cam-wheel turns, and is provided with a spiral spring, W, which is compressed when

the cam forces the rod forward, and serves to draw the rod back when released. By this means a reciprocating motion is given to arm E. This arm is arranged to operate in conjunction with the spreading-looper F, and the thumb and finger *m*, with which it is provided, meet the hooked point or end of the looper directly below the needle-entrance in the table after the needle is withdrawn, and on giving motion to the crank which draws the looper backward and downward the needle-thread is drawn in that direction and spread into a loop around and under the shuttle C. One side of the loop thus formed of the needle-thread passes between the thumb and finger *m* of arm E as it is being drawn down and spread by the looper, during which operation the arm E is at rest; but before the looper again rises the arm E is pushed forward, carrying between its thumb and finger that side of the loop which passed between them when the loop was drawn down and spread by the looper, which crosses or twists the loop and draws it up behind the shuttle, after which the needle enters through the loop thus crossed, one side over the other, and the thread it carries with it is drawn into another loop, as before, and while it is being drawn down and spread by the looper the needle-arm rises, so that by the downward movement of the looper and the upward movement of the needle-arm the first loop is drawn up and tightened around the second loop before it (the second loop) is crossed by the thumb and finger.

When not desired to operate the arm E, it is only necessary to loosen the screw which confines the dock to the rod P, in which case the ordinary lock-stitch will be formed by the machine. By cutting off or removing the shuttle-thread and using the arm E for crossing the loop the machine will form the "chain-stitch."

The looper is spread open as it moves backward by means of a wedge-shaped prong, H, whose point extends forward to the needle-entrance in the table, and between the spring-jaws F F, of which the looper is formed. This prong is fixed stationary to the under side of the table, and forms the bearing in which the lower end of the shuttle rests, so that as the loop is drawn down by the looper it is spread over the shuttle, between it and the casing in which it is inclosed, and forced against the end and raises the shuttle, under which it is carried before the looper is withdrawn.

The body of the shuttle C is cylindrical in shape; but its lower end tapers to a point on one side, and this point rests lightly on the upper side of the prong H in a groove, *x*, formed therein for the purpose. This peculiar shape is given to the end of the shuttle so as to allow the loop to pass freely over and under it, and this end is screwed onto the shuttle so that it can be easily removed for the purpose of inserting the bobbin R. The upper end of the shuttle is rounded and terminates in a point, *y*, on one side, through which the bobbin-thread passes. The shuttle is inclosed within a casing, D, fixed on the under side of the table, and is provided with one or more holes, *j*, for the passage of the bobbin-thread, which is wound round the pin *a'*, to regulate its tension. The casing D is open in front, so that the thread, when formed into a loop, may enter on either side of the shuttle, between it and the casing.

The needle-arm K has play on the bolt *f*, and the distance or length of its lateral movement on this bolt is regulated by the screw *z*, according to the length of stitch required. The elbow J of the needle-arm, extending below the table, is provided with a straight spring, *c'*, which bears against and is compressed by the cam S, formed on the side of cam-wheel O, when the arm is being forced outward, so that when the range of the arm's lateral vibration is limited to a greater or less degree than the depth of cam S the cam will be accommodated to the movement of the arm by the action of the spring.

A spiral spring, *d'*, is arranged around and fitted to the bolt *f*, within the pipe-box *h* of the needle-arm, whose office is to force the arm back when released by the cam, by which means a lateral reciprocating movement or vibration is given to the arm in the direction of the line of sewing. When the needle-arm is raised to its full height, it is forced or pushed outward the distance at which it is set by the adjusting-screw *z*, to regulate the length of the stitch, and after the needle descends and enters through the fabric the tooth *d*, taking hold and pressing on the same, the pressure-pad is raised and the needle-arm forced back by the action of the spring *d'*, carrying with it the fabric, thus feeding it by the action of spring *d'*. The needle-arm is provided with a tooth, *d*, on the side of the needle ahead of the stitching, which takes hold of the fabric when the needle enters through it, and the employment of this tooth or equivalent device effects a uniformity in the length of the stiches, inasmuch as it overcomes the liability of the needles being bent or strained, as when it alone is used for the purpose of feeding the material, in which case, it will be observed, the material would not be fed uniformly the distance of the needle-arm's lateral vibration, but only when the strain on it was insufficient to overcome its resistance or bend it.

It will be seen from Figs. 8 and 9 that the stitch is formed by drawing one loop through another; but in order to effect this it is necessary to use the thumb and finger *m*, which crosses one side, *a*, of the loop over the other side, *d*, after it is passed over the shuttle, as seen at Fig. 8. When the loop *c* is drawn down and spread by the looper, the needle-arm rises, and by the upward movement of the arm and the downward movement of the looper the first loop, B, is drawn up and tightened around the second loop, assuming the form of A, Fig. 9: The loop thus represented is formed without the shuttle-thread. With the shuttle-

thread *b* the twist of the loop is preserved, as seen from the manner in which it passes through and interlocks with the loop, Fig. 8.

Having thus described my improvements, what I claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of the stationary bobbin-case, the hook-stretchers, and the thumb and finger, or their equivalents, so arranged as to cross the needle-thread after it has been passed over the bobbin, so that the needle may pass down into this cross or loop of its own thread at each subsequent downward movement, for the purpose of running the under thread in a spiral form through a loop-stitch, substantially as herein shown.

2. The employment of the yielding tooth *d*, in combination with the vibrating bar K, when the same is used as a relief-feed, substantially as specified.

H. WM. DOPP.

Witnesses:

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S. BACTH.