

J. N. McLEAN & J. BENNOR.

Sewing-Machines.

No. 135,000.

Patented Jan. 21, 1873.

Fig 1.

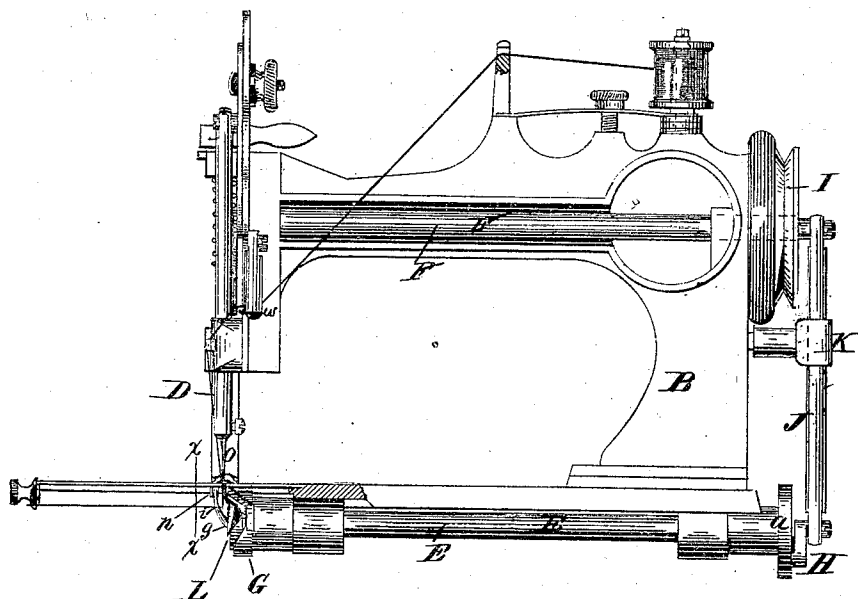
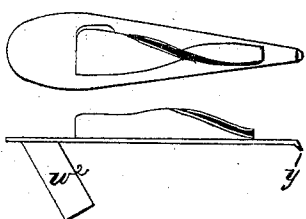


Fig 2.



Scale for Fig 1

Fig 3.

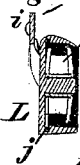


Fig 4.

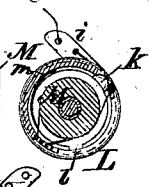


Fig 6.

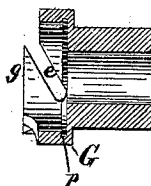


Fig 7.

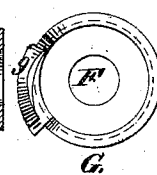


Fig 5.



WITNESSES

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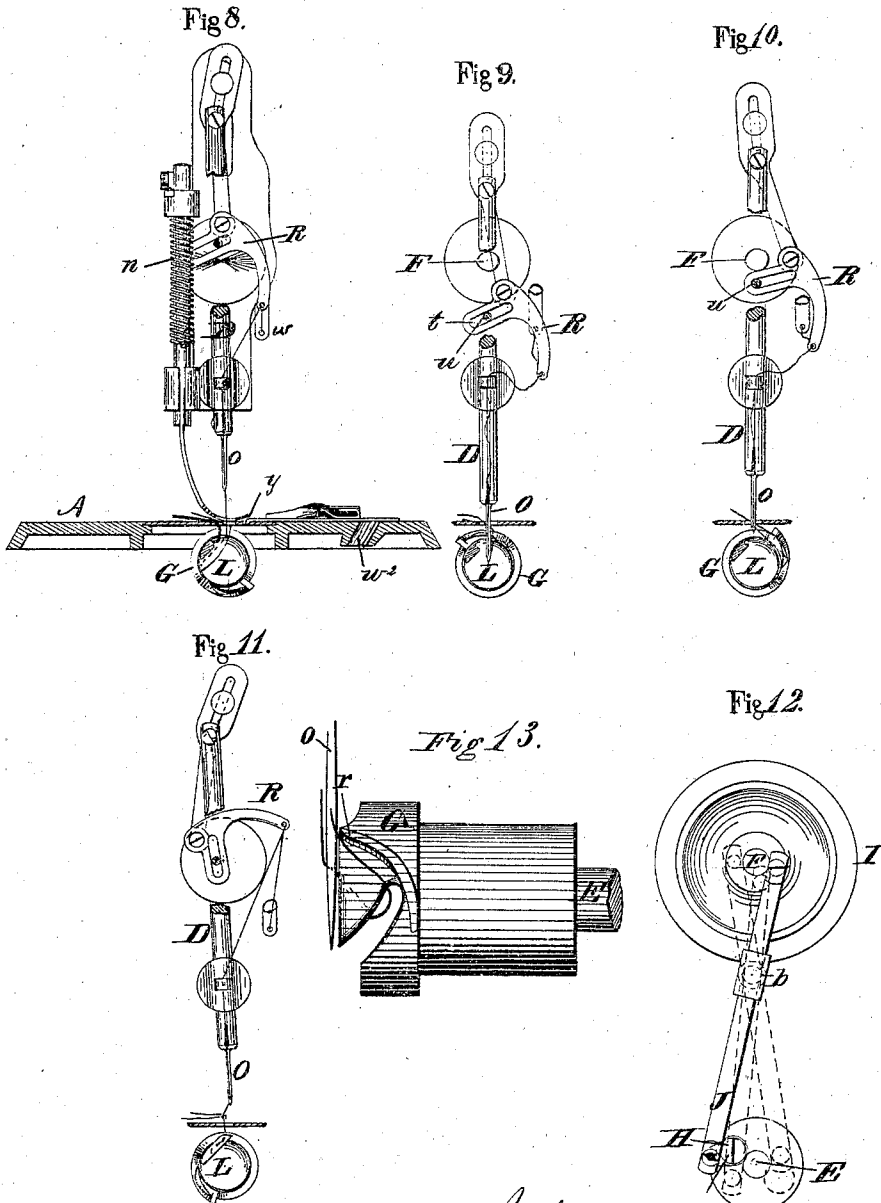
by Dodge & Munn
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UNITED STATES PATENT OFFICE.

JOHN N. McLEAN AND JOSEPH BENNOR, OF PHILADELPHIA, PA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 135,000, dated January 21, 1873.

To all whom it may concern:

Be it known that we, JOHN N. McLEAN and JOSEPH BENNOR, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawing:

Our invention consists in combining with the ordinary reciprocating needle of a double-thread machine a novel hooked head carrying a stationary bobbin-holder, for looping and interlocking the two threads; in a take-up for the upper thread; and in a novel manner of securing the attachments to the machine.

Figure 1 is a side elevation of our machine with a portion of the bed-plate broken away to show other parts; Fig. 2, a top and a side view of a hemming attachment, showing the inclined arm or stud by which it is held in place; Fig. 3, a vertical central section of the bobbin-holder, taken lengthwise of the machine; Fig. 4, a section of the same cross-wise of the machine; Fig. 5, an outside face view of the same; Figs. 6 and 7, respectively, a longitudinal section and an end view of the hooked head or looper; Figs. 8, 9, 10, and 11, cross-sections of the machine on the line $x x$ of Fig. 1, showing the needle and looper in their various positions; and Fig. 12, a view of the mechanism for giving the intermittent motion to the shaft of the rotating hooked head.

In the drawing, A represents the bed-plate of the machine, provided with the rigid arm B, which supports the cloth-presser C, needle-bar D, and the main shaft F, which is arranged to drive the needle-bar up and down in the usual manner. Under the bed-plate A there is mounted a horizontal shaft, E, which is provided on one end with the rotating hooked looper-head G, and on the other with a disk, a , as shown in Fig. 1, the disk having a short link, H, pivoted to its face, near one edge, as shown in Figs. 1 and 12. On the outer end of the main shaft F there is mounted a driving-pulley, I, and to said pulley there is pivoted a rod, J, which passes loosely through a block, K, pivoted to the frame, and has its lower end pivoted to the free end of the link H. When the pulley is set in motion it carries the upper end of the rod around in a circle, and causes it to vibrate and to slide through the block

K, so that its lower end is swung around in the opposite direction, and caused, by means of the link, to turn the lower shaft in the opposite direction to that in which the upper one revolves. The parts are so proportioned and arranged that the lower shaft is not given a continuous but an intermittent motion, as each time the link reaches the position shown in Fig. 12 the rod J turns it about a third of a revolution on its pivot, as shown in dotted lines, allowing the disk to stand still in the meanwhile. Thus, it will be seen, that while the upper shaft revolves continuously, it gives to the lower shaft an intermittent motion, allowing it to stop at the same point for an instant during each revolution. The object of this intermittent movement is to allow the hooked looping-head G to stop at a certain period in the formation of each stitch, as hereinafter described. The hooked looping-head G is rigidly attached to the end of the lower shaft E, and consists of a cylindrical head having a central recess formed in its outer side to receive the bobbin-holder, and a slot, e , cut obliquely inward from its outer side to the bottom of the recess, so as to leave a point or hook, g , as shown in Figs. 1, 6, and 7, the end of the point or hook being carried out a little beyond the side or end of the head, as shown in Fig. 6. The hook-head or looper G has on its periphery a projection, r , which runs in a slightly curved line diagonally across the exterior of the head, at nearly a right angle to the throat of the hook, as shown more clearly in Fig. 13. This ledge or projection r serves to prevent the loop of the needle-thread from slipping over the body of the looper-head and holds it at the outer end thereof, as shown in the drawing, thus insuring the casting off of the loop as soon as it has been carried far enough to pass over the bobbin, so that as the needle rises this loop is drawn up tight, and the stitch is completed before another is commenced. The bobbin-holder L consists of a round shell of the proper size to fit into the cavity of the hooked looping-head G, provided in its inner side with a recess or cavity to receive a round bobbin, M, and with a pintle for the bobbin to turn on, as shown in Figs. 3 and 4, and on its outer closed side with a thin tangential arm, i , as shown in Figs. 3, 4, 5, and 11. The holder L is

provided with a groove, *j*, around its inside, and with a lateral groove, *k*, leading inward thereto, while the bobbin is provided with an ear, *l*, which runs in the groove *j* so that the bobbin can only be removed when it is turned around in such a position that its ear *l* can slip out through the lateral groove *k*. The holder is also provided in its interior with a flat spring, *m*, Fig. 4, which bears on the edge of the bobbin to assist in producing the required tension on the thread as it is drawn off; the tension being, however, mainly produced by passing the thread back and forth through holes made in the side of the holder and in the end of its arm *i*, as shown in Figs. 3 and 4. The bobbin-holder, with the bobbin in it, is placed in the end of the looping-head *G*, and its arm *i* set into a notched lug, *n*, on the under side of the bed-plate, as shown in Fig. 1, so as to prevent the holder from turning with the head *G*, so that when the head is set in motion its hook *g* is carried around the outside of the holder and closely past its arm *i*. The holder is held in the head partly by the arm *i* and partly by a lug, *o*, which is formed on the holder and arranged to run in a groove, *p*, formed around the inside of the head, as shown in Fig. 6. The groove *p* intersects the slot *e*, so that when the slot is brought around opposite the lug *o* the holder may be removed from the head by slipping the lug out through the slot. The slot, being inclined, as shown, prevents the lug from slipping out through it when the head is turning forward, so that there is no danger of the bobbin-holder falling out while the machine is in operation. The needle is arranged to pass down close to the inner side of the arm *i*, at or near its end, and close to the outside of the bobbin-holder *L*, so that the point or hook *g* passes close to its side.

When the machine is in operation the needle *O* descends and carries the upper thread down through the fabric, and then, while the needle is at its lowest position, or just as it commences to rise, the hook or point *g* comes around and catches the needle-thread and draws it down so as to form a large loop, which slides back on the wide portion of the hook or point *g*, which opens it and carries it over or around the bobbin-holder, or, in other words, passes the bobbin-holder through the loop. It will be observed that the instant the needle-thread is fully back in the throat of the hook *g* its loop is spread sufficiently to pass around the bobbin, and that it is that part of the loop next to the eye of the needle that passes behind the bobbin, and that, as it slips from behind the bobbin, it is carried up on the outer side of the arm *i*, which gives to this needle-loop a half turn as it is drawn up around the bobbin-thread. After this has been done the hook releases the loop and the needle rises and takes up the slack, so as to reduce the loop in size and draw it off over the upper end of the arm *i* and tighten it up around the bobbin-thread, which passes through the end of arm *i* and up into the fabric being sewed, as shown.

The cloth is then advanced, and the needle again descends and has its thread carried around the bobbin-holder by the hook, as before, after which the needle again rises and draws its thread off over arm *i*, and up around the bobbin-thread, and so on repeatedly. After the hook has carried the upper thread around the bobbin and released it, it stops with its point just behind the needle, while the latter descends and the cloth is moved forward so that it is in position to take hold of the needle-thread instantly when the needle commences to rise. This stoppage of the hook is accomplished by means of the mechanism before described for driving the lower shaft. As the loop of the upper thread passes up over the arm *i* the arm gives it a half turn or twist, by which the loops or stitches are brought exactly in line in the fabric, and not lapped or offset in the usual manner. The arm *i* also bears against the thread on the outside of the needle, so that when the needle commences to rise the arm causes the thread to slide through the eye and bulge on the other side, so that the hook will be certain to catch it. Thus it will be seen that the arm *i* serves the three purposes of preventing the bobbin-holder from turning and holding it in place, of twisting the loops of the upper thread, and of bulging the upper thread out, so as to be caught by the hook. Any suitable feeding devices may be used for moving the material being sewed, my invention having no relation thereto. In the drawing the needle is arranged to feed the material by moving laterally while thrust down through it. Our take-up device for the upper thread consists of an elbow-lever, *R*, which is pivoted at its middle to an eccentric stud or a crank on the front end of the main shaft so as to be carried around therewith. One arm of the lever is provided with a slot, *t*, which receives a stud or pin, *u*, on the needle-bar, while the other arm is provided with a hole or eye in its end to receive the thread which is passed through an eye, *w*, on the frame, and then through the take-up and down to the needle, as shown in Figs. 1, 8, 9, &c.

As the main shaft is turned it carries the take-up about and causes the slotted arm to play back and forth on the pin of the needle-bar, so that as the needle descends the arm carrying the thread is turned down, as shown in Figs. 8, 9, and 10, so as to slacken the thread as required, and that just as the needle reaches its highest point the arm is turned up, as shown in Fig. 11, so as to draw the thread tight and finish the stitch.

The manner of securing the attachments, such as hemmers, braidiers, &c., to the bed, is clearly shown in Fig. 8, each one being provided with an inclined arm or stud, *w*², to fit into a corresponding hole in the bed, and with a lip or point, *y*, to fit into a notch in the bed in order to hold it from drawing out of place or moving sidewise. The arm or stud, being inclined toward the opposite end of the plate to which it is attached, of course prevents said

end from rising, while the point or lip, being turned down into the notch in the bed, prevents it from sliding back so that the stud can slip out of place.

When it is desired to remove the attachment it is only necessary to raise its point out of the notch, and to then lift its back end so as to draw the stud out of the bed. The attachment is applied by simply inserting the stud or arm in the hole in the bed-plate and pressing it down to its place.

This method of securing the attachments is very cheap, strong, and simple, and permits them to be attached and removed very quickly.

Having thus described our invention, what we claim is—

1. The rotating tubular head G provided with the hook *g* and the cast-off *r*, all constructed and arranged to operate substantially as described.

2. The lug *n* provided with a recess for the arm *i* of the bobbin-holder to rest in, said lug having a face or bearing at the point where the needle descends to force the thread inward and thus spread the loop, the whole being constructed and arranged to operate substantially as described.

3. The rotating head G provided with the internal groove *p*, in combination with the bobbin-holder L provided with the laterally-projecting lip *o*, substantially as set forth.

4. The bobbin-holder L provided with the internal circumferential groove, in combination with the bobbin M provided with the lip *l*, substantially as described.

5. The take-up, consisting of the arm R pivoted eccentrically on the end of the driving-shaft F, and having its slotted arm connected by a pin, *u*, to the needle-bar, as set forth.

6. A hemmer or other attachment for sewing-machines provided with an inclined arm or stud, *w*², and the hook *y* or its equivalent, whereby it is secured in place, substantially as described.

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ROBT. R. SMITH,

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