J. G. FOLSOM.

SEWING MACHINE.

No. 45,236. Patented Nov. 29. 1864.

Fig. 1.

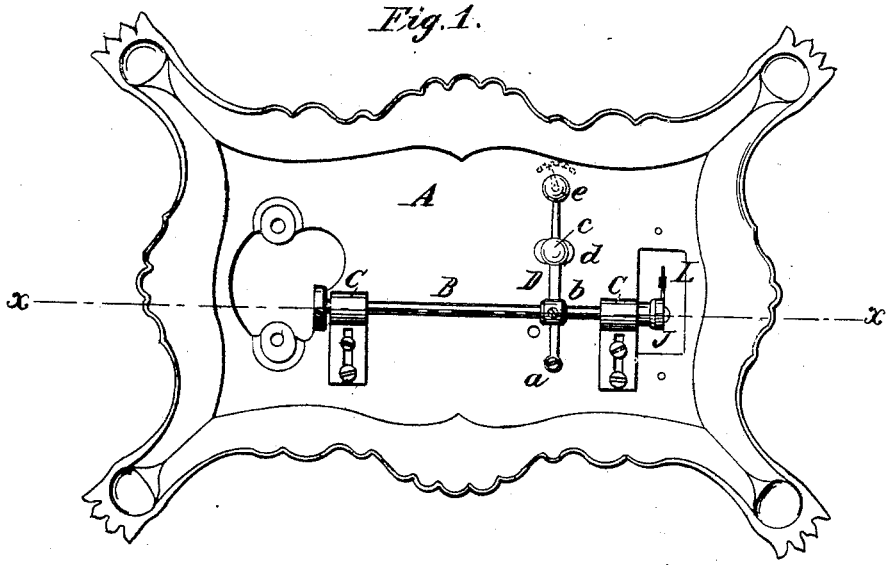


Fig. 3.

Fig. 2.

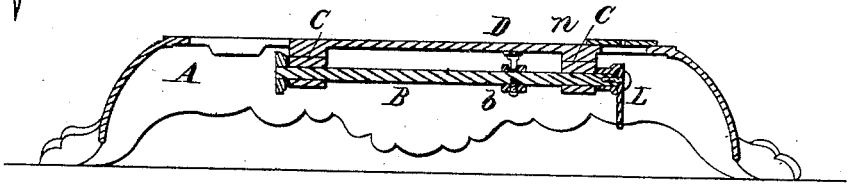


Fig. 4. *Fig. 5.* *Fig. 6.*

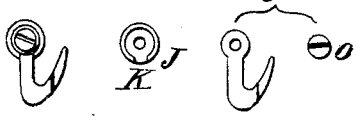


Fig. 7.

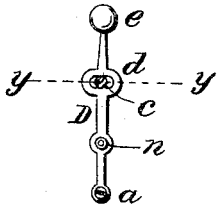
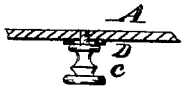


Fig. 8.



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JOHN G. FOLSOM, OF WINCHENDON, MASSACHUSETTS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **45,236**, dated November 29, 1864.

To all whom it may concern:

Be it known that I, JOHN G. FOLSOM, of Winchendon, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan as seen from below of a table or bed-plate of a sewing-machine containing my improvements. Fig. 2 is longitudinal section thereof on the line *x*. Fig. 3 is an elevation of an ordinary sewing-machine needle as made and used at present, showing the part *f* cut out to adjust it to the looper or lower needle, which by my improvements become unnecessary. Figs. 4, 5, and 6 are details showing how the looper is attached to its shaft. Figs. 7 and 8 are respectively a plan and a cross section of the device by which I adjust the looper or lower needle in position.

Similar letters of reference indicate like parts.

The object of my invention is to improve the sewing-machine by a new method of bringing about the adjustment of the lower needle relatively to the upper needle, and by a new method of securing the lower needle or looper to its shaft.

It is necessary in using the sewing-machine in which an upper and lower needle are employed that these needles should in passing each other come so near as to enable the lower needle or looper to enter the loop of the upper needle without fail, their paths being in fact so nearly in the same plane that their sides often come in contact. This has been found necessary in order to insure the formation of the stitch, since, if the needles were not in close proximity when the one is to take the loop of the other it would be liable to pass outside of the loop on account of the rapid movements of the parts, especially when the loop of the upper thread is imperfectly formed. The needle bar or arm which carries the upper needle is therefore made to travel in a certain fixed path, which will bring the needle in its reciprocations always near enough to the path of the looper, which has always heretofore traveled in a fixed path also. Now it is evident that whenever by reason of a change in the character of the work to be sewed the needle has to be replaced by one finer or coarser its proximity to the path of the lower needle will be changed by half the difference in the diameter of the needle substituted, which, if finer than the one for which the machine was originally adjusted, will cause the needles to be too far apart to enable the lower needle always to take the loop of the upper needle, and if coarser will cause the needles to crowd each other so that one or both will become bent and made unfit for service, or perhaps broken. The injury usually falls upon the upper needle, which is more slender than the looper.

In order to prevent injuries to the needles and delays in the sewing, as well as imperfect sewing from this cause, it has for years been customary to make sewing-machine needles of the form shown in Fig. 3, a portion, *f*, being cut away just above the eye, so that there will be always a space for the passage of the looper between the side of the needle and the thread, whatever may be the size of the needle, the portion cut away being of course the greater the coarser the needle. Under this arrangement, it is evident that if the adjustment of the needle-bar and of the looper-shaft be made from reference to the finest needle to be used on the machine, each needle of a larger size must be cut away one-half the difference between its diameter and that of the finest needle, in order to bring its axis near enough to the fixed path of the looper. As there are about six sizes of upper needles, it is clear that this mode of adjustment is expensive, laborious, and difficult of accomplishment. The cutting away of the needle also weakens it and causes it to break oftentimes, because it is not then strong enough to withstand the force necessary to send it through the cloth, leather, or other material to be sewed.

Another feature of my invention is the mode of securing the looper upon the end of its shaft so that it cannot be displaced in working, and cannot be put upon its shaft in a false position by the most unskillful person.

A represents the bed-plate of an ordinary sewing-machine inverted, and B the looper-shaft of a looper, L, for sewing with a single thread. The shaft is supported in adjustable bearings C, secured to the bed-plate, as usual, in which it is free to slide endwise.

The class of loopers which I have chosen to illustrate my invention is that which makes the chain-stitch with the needle-thread, its mo-

tion being vibratory about the axis of its shaft, which usually, as here, is made to rock in its bearings sufficiently to give the necessary movements to the looper.

A collar, *b*, is firmly secured to the shaft B at any suitable point in its length. This collar is slotted in a direction at right angles to its axis to receive a pin, *n*, loosely fitting in it, fast on a shipper, D, which is secured to the bed-plate by a fulcrum-pin, *a*, and by means of a clamping-screw, *c*. The clamping-screw *c* passes into a screw-threaded hole tapped in the bed-plate, through a transverse slot or eye, *d*, formed in the shipper, and clamps the shipper in any position to which it has been moved by means of the handle *e*.

The operation of the parts is as follows: When a change is to be made in the size of the needle from larger to smaller, or vice versa, the screw *c* is turned so as to release the shipper, when the operator seizes the handle *e* and moves the shipper to the right or left, carrying the shaft B with it by means of the pin *n*, pushing the slotted collar *b* until the looper L is brought to a proper adjustment with the substituted needle. The screw *c* is then made to clamp the shipper, and thereby also the shaft, in its new position, and the sewing is ready to be proceeded with. One effect of this adjustment of the looper is to save the necessity of cutting away part of the side of the needle, as before explained, and to enable needles of all sizes to be made with straight sides, thereby saving much labor and expense now expended in cutting them away.

It is evident that this improvement is equally applicable to revolving loopers by continuing the slot which receives the pin of the shipper so that it shall encircle the collar *b;* or the collar *b* may be composed of two rings fixed to the shaft at such a distance apart as to permit the pin to pass between them.

The looper is seen in detail in Figs. 4, 5, and 6, with the devices by which I secure it on its shaft. J is a head, which is shrunk on the looper end of the shaft B, or secured by any other means. It is countersunk, as seen in Fig. 5, and its edge on one side is cut away at K, so as to receive the eye of the looper fitting in the slot K, so that the eye of the looper is flush with the head J. It is then secured to the head J by a screw, O.

Instead of making the head J separate and then uniting it to the shaft, the end of the shaft itself may be countersunk so as to receive the looper. By this means the looper is fixed in its true position on the shaft without possibility of mistake, while it can only be put out of position by the torsion of the shaft itself. The measure of adjustment of the looper-shaft need not be left to the skill of the operator; but it can be ascertained by means of an index on the top of the bed-plate, which may be moved from the shipper through a slot made in the bed-plate, a scale being marked on the bed-plate to indicate the positions of the index for the different sizes of needles usually employed on sewing-machines.

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

1. Adjusting the looper or lower needle of a sewing-machine to suit the different sizes of upper needles by an endwise motion of its shaft, whether it be a vibrating or revolving looper, substantially in the manner and for the purpose above described.

2. Locking the looper in its proper position by sinking its eye and shank in the end of its shaft, substantially as above described.

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