(No Model.)

L. A. MILLER.

SEWING MACHINE SHUTTLE.

No. 436,837. Patented Sept. 23, 1890.

Fig. 1.

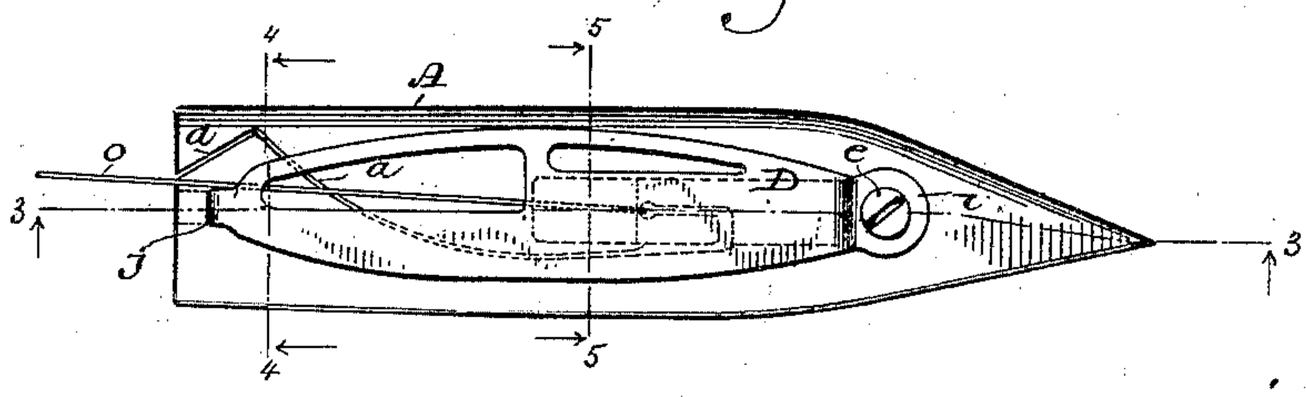


Fig. 2.

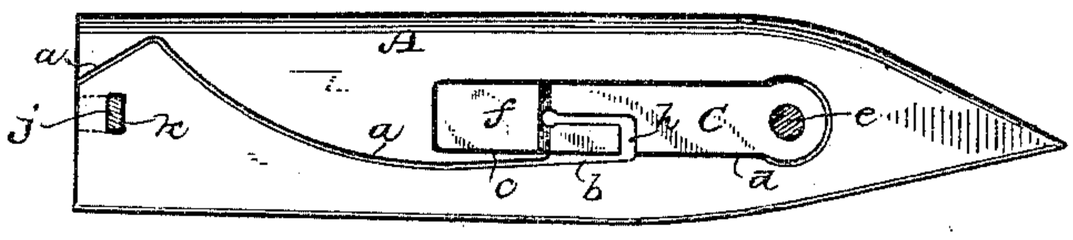


Fig. 4.

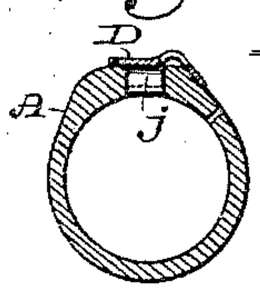


Fig. 3.

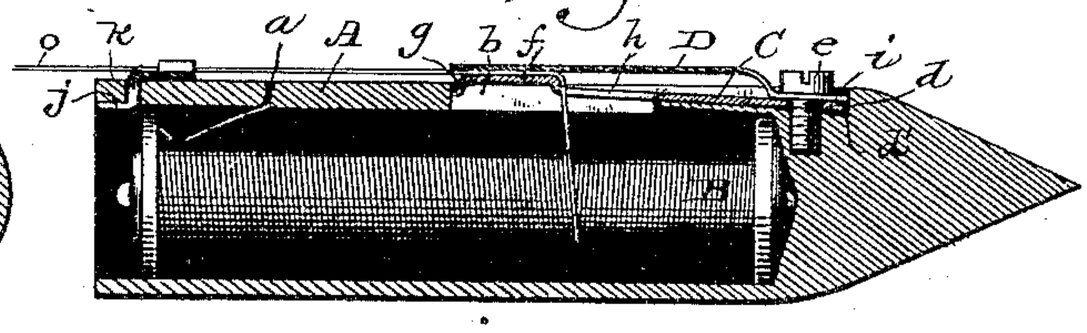


Fig. 5.

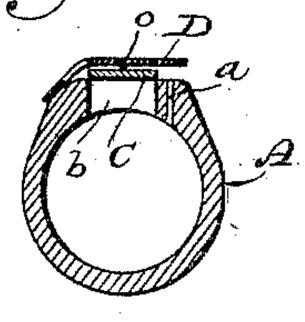


Fig. 8.

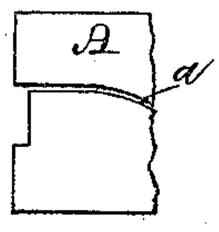


Fig. 6.

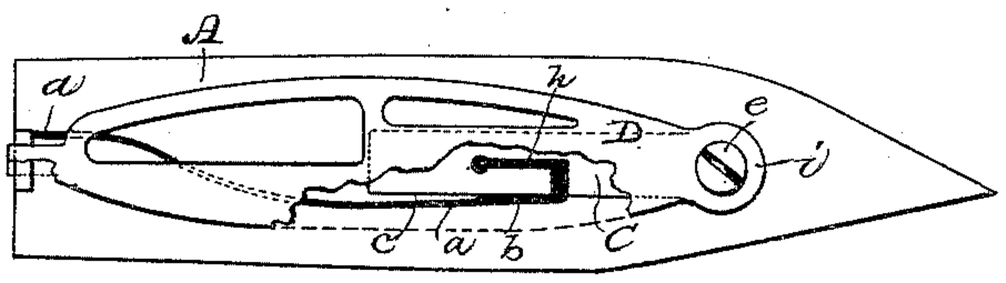


Fig. 9.

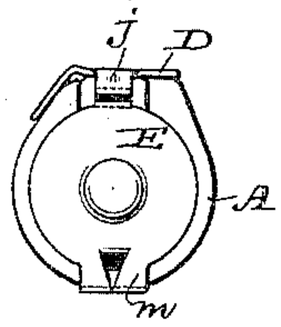


Fig. 7.

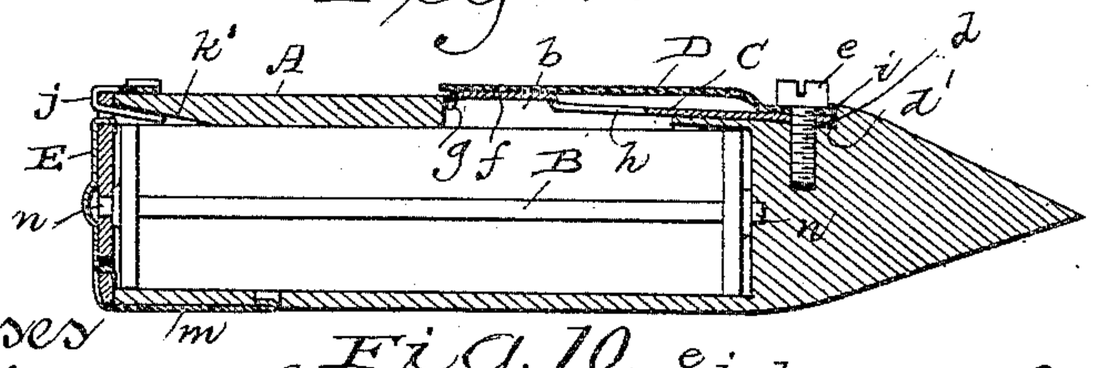
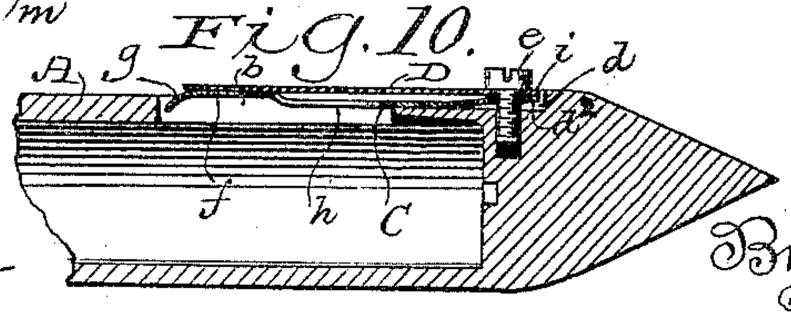


Fig. 10.



Witnesses
Geo. W. Young.
Wm. Klug

Inventor
Lee. A. Miller.
By H. G. Underwood.
Attorney

UNITED STATES PATENT OFFICE.

LEE A. MILLER, OF PORTAGE, ASSIGNOR TO SAMUEL B. FULLER, OF WATERTOWN, WISCONSIN.

SEWING-MACHINE SHUTTLE.

SPECIFICATION forming part of Letters Patent No. 436,837, dated September 23, 1890.

Application filed February 21, 1890. Serial No. 341,267. (No model.)

To all whom it may concern:

Be it known that I, LEE A. MILLER, of Portage, in the county of Columbia, and in the State of Wisconsin, have invented certain new and useful Improvements in Sewing-Machine Shuttles; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to sewing-machine shuttles; and it consists in certain peculiarities of construction, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a plan view of my improved shuttle in the form showing an open end. Fig. 2 is a like view with the shuttle-spring removed. Fig. 3 is a longitudinal vertical section on the line 3 3 of Fig. 1. Figs. 4 and 5 are transverse sectional views on the lines 4 4 and 5 5, respectively, of Fig. 1. Fig. 6 is a plan view, partly broken away, of that form of my shuttle having a closed end. Fig. 7 is a longitudinal vertical section of said form. Fig. 8 is a detail plan view of one end of said form with the shuttle-spring removed, and Fig. 9 is an end view of said closed end of this form of my shuttle. Fig. 10 is a sectional detail of a modified construction.

A represents the shell of the shuttle, which has one pointed end and one blunt end, as is common, said shell receiving a bobbin B, as shown.

In my shuttle the sides thereof are solid and the threading-slit *a* is cut through the top, extending from the blunt end to about the center of the slot *b*, which receives the free end of the tension-spring C. In the open-ended form of shuttle the threading-slit *a* extends first in a line oblique to that of the blunt end nearly to one side of the shuttle and then abruptly extends forward and more than half-way across the top to said slot *b*, leaving a narrow tongue of metal *c* between it and the rear portion of said slot. In the other form of shuttle, having a closed end, the threading-slit *a* starts from the blunt end in nearly a straight line and then continues, as before, to the slot *b*. Forward of and in line with this slot *b* there is a recess or depression *d* in the top of the shuttle for the reception of the forward end of the tension-spring C, which is secured in place by a screw *e*, the rear end of said spring being offset or elevated, as shown at *f*, and terminating in a downward bend, as shown at *g*, and said spring C is further provided with a right-angled slot *h*, cut in from one side at about the center, half-way across, and thence extending rearwardly in a central longitudinal line to about the beginning of the offset portion *f* of said spring, and preferably somewhat enlarged or rounded out at its end, as shown.

D is the shuttle-spring, of the general shape shown in the drawings and having its front end offset or bent down, as shown at *i*, so as to rest flatly upon the front end of the tension-spring C, and there secured to the shuttle by the same screw *e*. The main portion of the spring D is of a higher plane, so that its central part normally rests squarely upon the raised portion *f* of the spring C. The rear end *j* of the spring D engages with the rear end of the shuttle, so that said spring is fastened at each end. In the form of spring shown in the first five figures of the drawings the rear end *j* of the shuttle-spring D is turned outward and inserted through a hole *k* in said shuttle-shell, while in the form shown in the last four figures of the drawings the said end is inturned and (after passing through the upper end of the door E, that closes the end of the shuttle) fits into a recess *k'* in the shuttle-shell. The said door is of ordinary construction, with the usual latch *m* for engagement with the under side of the shuttle. In the first form of device the bobbin B is merely slipped within the shuttle; but in the second form the bobbin has trunnions or pintles *n n* on its heads, which fit into corresponding mortises in the head of the shuttle and inside of the door.

The thread *o* is admitted to place through the slit *a*, slot *b*, and angle-shaped slot *h*, and thence passes back between the part *f* of the tension-spring C and the superimposed shuttle-spring D and out beyond the rear of the

latter, as shown in Fig. 1. There is no pressure on the thread after it leaves the tension-spring, and, as the inner end of the latter is free, there will always be the same amount of tension between the two springs, no matter whether a very fine or a very coarse thread (or anything between the two) is used, and no adjustment of the tension is necessary in changing from thread of one degree of fineness to another; but should the operator desire to increase or diminish the tension in the shuttle at any time this can be instantly done by turning the screw *e* either to the right or left, the former turn resulting in raising the tension-spring C more firmly against the shuttle-spring D, which increases the tension, while a turn of the screw *e* in the opposite direction allows the tension-spring C to drop away from the spring D, thereby diminishing the pressure and causing a looser tension, and these changes in the tension can be made without removing the shuttle or displacing any work.

The operation of threading the shuttle is simple and almost instantaneous, being always directly from the rear end, and no elaborate instructions or patient practice is required. Again, as the threading-slit is on top, it is free from the injury by wear and friction that occurs with shuttles threaded from the side, and, further, having solid smooth sides, the shuttle has less frictional resistance to overcome in its movements. Further, in the operation of threading my shuttle the thread cleans out all dust, lint, fibers, and other foreign matters between the two springs, thereby forming a non-clogging tension, and as the thread goes back in a straight line after leaving the inner end of the right-angled slot *h* it is much less liable to break than in the former constructions, where it was fed transversely across or between and against posts and other obstructions.

In Figs. 3 and 7 I show an increased space or added depth *d'* to the front end of the described recess *d* beneath the front end of the tension-spring C, the object of this being to provide space for the front end of said spring C when the screw *e* is screwed down, so as to raise the rear end *f* of said spring more firmly against the shuttle-spring D, as already described, to increase the tension, the higher part of the said recess or depression *d* just back of this portion *d'* thereof acting as a fulcrum-point for the said spring C in this operation. In Fig. 10 I show the front end d^2 of the said spring C somewhat raised to accomplish this same result without deepening the recess *d* at the point *d'*.

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

1. A sewing-machine-shuttle shell having solid sides and a slot in its upper surface intermediate between the ends thereof, a tension-spring secured to said shell and having a free end yielding vertically within said slot, a superimposed shuttle-spring, and a threading-slit formed wholly in the top surface of said shell and extending from the rear edge thereof forward to a point about midway of the length of the said tension-spring, substantially as set forth.

2. A sewing-machine shuttle having a threading-slit and a slot in its upper surface communicating with the threading-slit, a tension spring having a right-angled slot communicating with said first-named slot and a raised inner free end yielding within said slot, and a superimposed shuttle-spring normally resting on said raised portion of the tension-spring and secured to the shuttle at each end, substantially as set forth.

3. In a sewing-machine shuttle, the combination, with the shell having a slot in its upper surface and a depression or recess at one end next and in line with said slot and of less length than the latter and a tension-spring having one end in said recess and the other end yielding within said slot and extending the full length thereof, of a superimposed shuttle-spring secured at one end of said shell and a screw passing through both springs at the other end of said shell and into said recess, whereby when said screw is loosened the free end of the tension-spring will drop away from the shuttle-spring by gravity and when said screw is tightened said free end of the tension-spring will automatically rise and press against the under side of said shuttle-spring and the latter spring be simultaneously compressed down against the tension-spring, substantially as set forth.

4. In a sewing-machine shuttle, the combination of a solid-sided shell having a longitudinal slot in its upper surface, a threading-slit extending from the rear end of the upper surface of said shell to a point about midway of said slot, and a tension-spring movably located in said slot and having a right-angled slot communicating transversely with the end of the said threading-slit in the shell and thence continuing rearward in the direction of the length of the said tension-spring, whereby the shuttle may be threaded directly from the rear end with one direct pull of the thread toward the point of the shuttle, substantially as set forth.

5. In a sewing-machine shuttle, the combination of a solid-sided shell having a longitudinal slot in its upper surface, a threading-slit extending from the rear end of the upper surface of said shell to a point about midway of said slot, a tension-spring movably located in said slot and having a right-angled slot communicating transversely with the end of the said threading-slit in the shell and thence continuing rearward in the direction of the length of the said tension-spring, and a shuttle-spring secured at each end only to the upper surface of the shell and normally in contact with the free end of the tension-spring,

whereby the said shuttle may be threaded directly from the rear end with one direct pull of the thread toward the point of the shuttle and any foreign substance between the two springs simultaneously removed thereby, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at the city of Eau Claire, in the county of Eau Claire and State of Wisconsin, in the presence of two witnesses.

LEE A. MILLER.

Witnesses:
ED. H. HIBBARD,
JOHN LANGDOR.