

W. H. THAYER.

Shuttles for Sewing-Machines.

No. 143,104.

Patented September 23, 1873.

Fig 1.

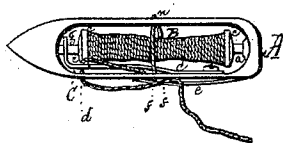


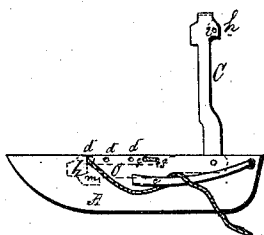
Fig 2.



Fig 3.



Fig 4.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM H. THAYER, OF SOMERVILLE, ASSIGNOR OF ONE-HALF HIS RIGHT
TO ABNER J. TOWER AND JOHN J. CILLEY, OF BOSTON, MASS.

IMPROVEMENT IN SHUTTLES FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **143,104**, dated September 23, 1873; application filed
July 12, 1873.

To all whom it may concern:

Be it known that I, WILLIAM H. THAYER, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain Improvements in Sewing-Machine Shuttles, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a plan of a shuttle and bobbin having my improvement applied thereto. Fig. 2 represents a transverse, and Fig. 3 a longitudinal, section of the same; and Fig. 4, a side elevation, showing the combined tension-regulator and bobbin-holder elevated ready for the insertion or removal of the bobbin.

The object of my invention is to simplify the construction of sewing-machine shuttles, and at the same time increase their efficiency; and its nature consists in providing one end of the shuttle-case with a transverse bearing or support for one end of the bobbin-axis, and on which it may move laterally; and in so constructing a pivoted compensating-spring, and in so arranging the same with relation to the bearing for the bobbin, that it will not only act as a latch to keep the bobbin in place, but so as to enable the bobbin to deliver its thread with a uniform tension to the devices of the shuttle which regulate the degree of tension with which the thread is delivered to the machine. This combination of devices allows the compensating-spring to force the edge of the bobbin-head against the inner wall of the shuttle-case, thus furnishing two frictional points for regulating the turning of the bobbin, thereby rendering it much more sensitive to the drag of the thread as the diameter of the latter on the bobbin decreases. In other words, my invention consists in combining with the bobbin and shuttle of a sewing-machine a combined latch-holder for the bobbin and compensating device for the delivery of the thread from the former with a uniform tension to the devices of the latter which regulate the degree of tension with which the thread is delivered to the machine.

To enable others skilled in the art to make, construct, and use my invention, I will now proceed to describe its parts in detail.

In the accompanying drawing, the shuttle A is represented as being made of the usual form, and may be constructed of metal or any other suitable material or combination of materials; and is provided at its heel on the inside with a pivotal bearing, *a*, for the support of the rear end of the axis of the bobbin, and at its forward or toe end, and inside, with a horizontal ledge or projection, *b*, extending transversely across or nearly across the shuttle-case for the support of the forward end of the axis of the bobbin. The length of this ledge and its arrangement should be such that, in sliding that end of the bobbin which rests upon it from side to side, the axis of the latter cannot drop down from either end when the edge of the bobbin-head *c* is pressed against the walls of the shuttle-case. The bobbin B may be made in the usual manner. In the upper side of the shuttle-case are pierced a number of openings, *d*, through which the thread is laced in order to regulate the degree of tension with which the thread is delivered from the shuttle to the machine; an auxiliary spring-tension and guide-bar, *e*, being also arranged and secured to the same side of the shuttle for the same purpose, the thread, to that end, being passed between it and the outside of the shuttle-case. Two other openings, *f, f*, are also made in the same side of the shuttle-case for a purpose shortly to be described. To the inside of the upper side of the shuttle, and near its heel, is pivoted at one end a compensating spring-bar, C, the other end of which, when in place, as shown in Figs. 1 and 4, is made to project beyond the forward head *c* of the bobbin B, and is bent around so as to extend over and beyond the axis or spindle of the bobbin to form the upper bearing of that end of the axis, so as to keep the bobbin in place ready for work. This bent end *g* of the spring C is made of a length just sufficient, or a little less than sufficient, to impinge against the inner side of the lower wall of the shuttle-case when the spring-bar C forces the head *c* of the bobbin against that wall, which will afford all the lateral play necessary to the spring in compensating for the increased drag of the thread on the bobbin as the latter grows gradually

empty. The normal shape and position of the spring itself is such that, when the bobbin is removed, its bent end *g* will bear against the lower wall of the shuttle-case. Immediately above the point of contact between the spring C and head *c* of the bobbin on the spring-bar C is formed a lug, *h*, in which is formed an opening, *i*, through which the thread is passed after it has passed through the openings *f f* in the upper side of the shuttle-case, and from the opening *i* is then passed through the openings *d d d* of the shuttle, which regulate the degree of tension with which the thread is delivered from the shuttle to the machine.

By reference to Fig. 4, it will be seen that the outer edge of the spring-bar C has been cut out so as to form the lug *h*, and for a distance and a depth sufficient, when in position, as shown in dotted lines, Fig. 4, to leave a clear passage for the thread from the bobbin through the openings *f f*, and from there to the opening *i* on the inside of the lug *h*, while on its inner edge the metal has been so cut away as to leave another lug, *m*, which is intended to act as a stop for the bar C to prevent its bent end *g* from pressing too tightly upon the forward end of the spindle or axis of the bobbin. That lug, however, may be dispensed with; but it is deemed better to use it. The under side of the shuttle is provided with two longitudinal slots, *n n*, Fig. 2, through which the thread is passed as it first leaves the bobbin to the openings *f f* on the other side of the shuttle.

The operation is as follows: An empty shuttle being taken, the spring-bar C is raised, as shown in Fig. 4, and a full bobbin inserted by placing the rear end of its axis in the pivotal bearing *a* at the heel of the shuttle, and then depressing the forward end of its axis until it rests upon the ledge or projection *b*, care, however, having first been taken to so place the bobbin that the thread will be delivered from its under side, first passing it through

the inner slot *n* on the lower side of the shuttle; this done, the bar C is then forced down, as shown in dotted lines in Fig. 4, and the thread then passed through the outer slot *n*, and thence across the face of the bobbin through the rear opening *f* in the upper side of the case, and thence through the other opening *f* to the opening *i* in the lug *h* of the spring-bar C; then through that opening, and thence through the openings *d d d*, and from there, if desired, between the auxiliary spring-bar *e* and the upper side of the shuttle-case, and thence for delivery to the machine. Thus threaded, as the thread runs off the spool its leverage on the bobbin will diminish, and the drag on the latter consequently increase in a corresponding ratio, and exert on the bar C an increased force, diminishing in a corresponding degree its pressure on the bobbin-head *c*, thereby allowing it to turn more freely. The release of the pressure of the spring on the head C also releases it from the friction of the wall of the shuttle on its other side—an arrangement which renders the bobbin exceedingly sensitive to any increased drag on the thread. While these operations have been going on, the bent end of the bar C serves to keep the bobbin securely in place.

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

The combined compensating-spring and latch-bar C *g*, when constructed, arranged, and operated in the manner substantially as described, and used in connection with a bobbin and shuttle of a sewing-machine, for the purpose set forth.

In testimony whereof I have hereunto set my hand to this specification.

WILLIAM H. THAYER.

Witnesses:

A. H. NONES,
CHAS. T. BRUEN.