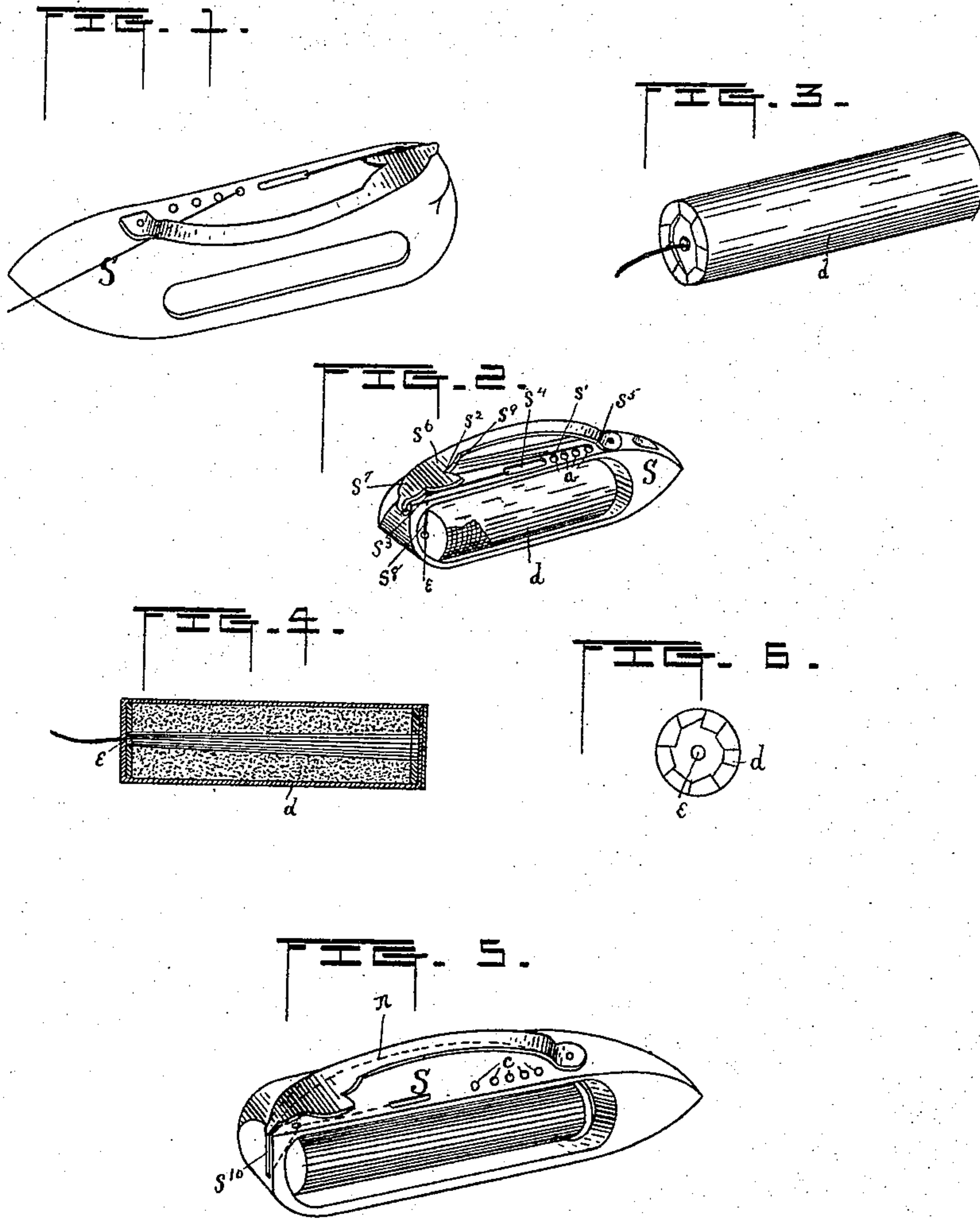


(No Model.)

W. DUCHEMIN.  
SHUTTLE FOR SEWING MACHINES.

No. 459,814.

Patented Sept. 22, 1891.



Witnesses

And. M. Collin  
L. A. Comer, Jr.

Inventor  
William Duchemin



# UNITED STATES PATENT OFFICE.

WILLIAM DUCHEMIN, OF NEWBURYPORT, MASSACHUSETTS, ASSIGNOR OF  
ONE-HALF TO HENRY W. BLAIR, OF MANCHESTER, NEW HAMPSHIRE.

## SHUTTLE FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 459,814, dated September 22, 1891.

Application filed August 4, 1890. Serial No. 360,956. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM DUCHEMIN, a subject of the Queen of England, residing at Newburyport, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machine Shuttles; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in metal shuttles used in sewing-machines, and especially adapted for that class in which the stitches range from those required for domestic purposes to stitches of two or more inches in length; and the objects of my improvements are to provide a shuttle therefor of such construction that cops from which the thread is discharged from the interior can be used therein; also, to provide a tension therefor of such a nature that the thread will be free from tension at all times, except at the finish of the stitch. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective of the back of the shuttle, showing the mode of threading the same; Fig. 2, a perspective of the front of the shuttle, showing the cop in position therein and having a part of the case broken out; Fig. 3, a perspective of the cop; Fig. 4, a cross-section of the same, showing the interior of the central vent; Fig. 5, front elevation of a shuttle having the ordinary bobbin therein; and Fig. 6, a plan of the front disk of the cop, showing the mode of securing said disk to the shell of the case.

Similar letters refer to similar parts throughout the several views.

S, Fig. 2, represents the shuttle, which is made in the form of the ordinary open shuttle, and is provided at the heel with a hole  $s^3$ , that extends from the interior through the side surface of the shuttle, a short distance in advance of which is a slot  $s^4$ , between which and the shoulder  $s^5$  of the thread-guard  $s^6$  is a series of holes  $a$ , the first hole  $s'$  being placed about mid-length of the interior of the shuttle. The thread-guard  $s^6$  is made in a different form from the guards used at pres-

ent on this class of shuttles, which taper gradually narrower to the rear, as shown by the dotted lines  $n$ , Fig. 5, inasmuch as that its rear end terminates in a tension-plate  $s^7$ , the forward end of which is provided with a V-shaped recess  $s^2$ . The outer marginal edge of this recess  $s^2$  is beveled down to a feather-edge at the under surface, its inner marginal edge being of the same bevel reversed, and the shaft is wider and is of the same width from the shoulder  $s^5$  to the tension-plate  $s^7$ . The tension-plate  $s^7$  is placed a sufficient distance from the face of the shuttle to prevent it from coming in contact with the thread during its passage from the hole  $s^3$  to the slot  $s^4$ , as it is not intended that the plate  $s^7$  shall interfere with the thread in any manner or at any time, except at the finishing of the stitch. To place the shuttle in working condition, the cop  $d$  is placed in the shuttle, the perforated disk thereof being at the heel of said shuttle, and the thread  $s^8$  drawn from the vent  $e$  and passed out through the hole  $s^3$  and in through the slot  $s^4$ , and, if the thread is of the finest quality, out through the hole  $s'$ ; if of the coarsest, through the hole nearest the shoulder  $s^5$  and under the guard  $s^6$ , as shown in Fig. 1.

The operation of this device is as follows: When the shuttle has passed through the needle-loop and is being drawn back, the thread is drawn forward and is free from tension, the friction of its passage through the holes  $s^3$  and  $s'$  being sufficient to prevent it from passing out too freely, and when the shuttle is again sent forward the thread is led back by the action of the guard  $s^6$  and under the plate  $s^7$ , where it comes in contact with the feather-edge  $s^9$  of the recess  $s^2$  and is drawn into the center of said recess and under the bearing of said plate, and is thus placed under tension. When the shuttle is again drawn back, the outer marginal edge of the plate  $s^7$  is rounded from the under surface in such proportion that the thread is thrown out thereby and again comes in contact with the edge  $s^9$  and by the reversed action thereof is sent out from under the tension, which action releases it from tension. Care must be taken to place the hole  $s^3$  in the rear of the disk of the cop to prevent the wear thereof by the



friction of the passing thread. The hole  $s^3$  may be substituted by a slot cut in the upper side of the heel and extending inward a trifle beyond the interior surface of the shuttle, as shown by the dotted line  $s^{10}$ , Fig. 5. When threading the shuttle, care must be had to place the finest grades of thread in the first hole  $s'$  of the series  $\alpha$  and in the next hole as the thread becomes coarser, for the reason that the nearer the thread approaches a straight line in its passage through the shuttle the less the friction in its passing, and it is for this purpose that the slot  $s^4$  is intended, and as the coarser threads are the least pliable the farther they are threaded from the slot  $s^4$  the better, inasmuch as there will be less friction and a consequent smoother tension. Nor must the thread be passed through more than one of the holes, as they are simply intended to place a slight friction on the thread to prevent it from passing from the shuttle too freely, and thus cause an overplus thereof; but it is imperative that the friction be reduced as much as possible, especially in long stitches, for the reason that the thread required for a stitch two inches long will pass out of the shuttle sixteen to one quicker than for a stitch that is an eighth of an inch in length.

It will be understood that these changes in the construction of the shuttle do not interfere in any manner with any of the other parts or prevent the use of the ordinary bobbin, which may be placed therein in the usual manner and the thread passed out through the hole  $s'$  and under the thread-guard  $s^6$ , as shown in Fig. 5. It will also be noted that the improvements herein described can be placed on cylinder shuttles as readily as on the class herein named by simply removing the ordinary tension and substituting therefor the tension herein described. The thread,

however, is not repassed into the interior, but is passed out through the hole in the heel and through a small eyelet placed at mid-length on the exterior surface of the shuttle and out under the guard.

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

1. A shuttle for sewing-machines, provided with a cop that gives out the thread from the center and with a hole in the heel for the passage of the thread therefrom, located between the perforated end of the cop and the interior surface of the end of the shuttle, and a thread-guard on the outside of the shuttle, having at its rear a tension-plate bearing on the shuttle-body, whereby the thread is held under tension at and during the finishing of the stitch and is practically free from restraint at other times, substantially as set forth.

2. A shuttle for sewing-machines, provided with a cop  $d$ , having the central vent  $e$  for the exit of the thread, the said shuttle having the hole  $s^3$  in the heel thereof, the slot  $s^4$ , and the series of holes  $\alpha$ , all for the passage of the thread, and the thread-guard  $s^6$ , having at its rear the tension-plate  $s^7$ , provided with the V-shaped recess  $s^2$ , whereby the thread is drawn in and held under the tension-plate at and during the finishing of the stitch and is led out from under the tension-plate and left practically free from restraint at and during the formation of the stitch, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM DUCHEMIN.

Witnesses:

LENDELL A. CONNER, Jr.,  
ARCH. M. CATLIN.