To all whom it may concern:

Be it known that I, JOHN W. DARBY, JR., a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Thread Severing and Holding Mechanism for Sewing-Machines; 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 thread severing and holding mechanism for sewing machines, and is especially designed for sewing machines used for attaching buttons to garments, but it is not restricted to this special class of sewing machines, as it is capable of general application.

This application is a division of my former application No. 553,772, filed April 6, 1910.

The object of my invention is to provide a simple thread severing and holding mechanism especially designed to be used with the button sewing machine which forms the subject of a companion application, Serial No. 570,057, filed this day.

With this object in view and others that will appear in the detailed description, my invention consists in the construction and combinations of parts as hereinafter described and claimed.

In the accompanying drawings—Figure 1 is an inverted plan view of the severing mechanism, showing trimmers for the needle and shuttle threads and the holding devices for the needle thread, in the position of rest. Fig. 2 is a similar view, the operating part being omitted, and showing the parts in the position at the end of the first stitch. Fig. 3 is a similar view, showing the parts in the position at the end of the fourth stitch. Fig. 4 is a perspective view, on a larger scale, of the trimmers and one of the holding means for the needle thread. Fig. 5 is a perspective view of the other member of the holding device for the needle thread. Fig. 6 is a cross-section on the line 6—6 of Fig. 4.

The shuttle is supported below the bed plate in the usual manner and operates in the usual way. The additional new features peculiar to this invention are shown most clearly in Figs. 4 and 5.

26 and 27 are knives, of well known construction, for severing the shuttle thread and needle thread, respectively, and the holder 28 is of well known construction also, and is adapted to hold the beginning end of the 26 needle thread. The knives and driving gear 29 are all mounted on a pivot pin 30, and below the knife 27 is a curved guard 31, attached to the operating gear by the same screw 32 that holds the knives 26 and 27 in place, and it is kept in position by the pin 33, which also prevents the thread holder 28 from being displaced.

Attached to the throat plate 35 which forms a part of the body of the machine, by means of screws 34, is a curved arm 36, which terminates at its free end in a flat portion 37, provided with up-turned ends 38, which part 37 is adapted to lie in the path of the thread holder 28. The arm 36 is of spring metal, holding the end 37 against the throat plate, unless it is displaced by the thread holder 28.

40 represents the free end of the needle thread and 41 a hole in the throat plate, through which this needle passes.

The operation is as follows: The machine is threaded and the button sewed on as described in my said companion applications, and need not be specifically described here. A loop is formed in the needle thread and the point of the shuttle hook enters this loop in the well known manner, and the further movement of the shuttle pulls down the free end 40 of the needle thread through the hole 41 in the throat plate. During this downward movement, the needle thread is clamped in the well known manner, so that the thread cannot be pulled through the hole in the end of the needle toward the shuttle, thus causing the shuttle to pull the end 40 of the needle thread through the hole 41. The needle then continues to rise, and at a point near the end of the upward motion of the needle during the first stitch, the entire system of parts shown in Fig. 4 moves, bringing the hook on the thread holder 28 across the hole 41 in the throat plate, pulling the end 40 of the needle thread along with it, and binding itself between itself, the throat plate, and the portion 37 of the spring arm 36. The sewing then continues and during the second stitch, and at about the time when the shuttle hook engages the loop in the needle thread, this thread is unclamped, so that 110
it may pass over the shuttle without resistance, in the usual way.

At the end of the fourth stitch, the parts shown in Fig. 4 are shifted from the position shown in Fig. 2 to that shown in Fig. 3, and during this operation the end 40 of the needle thread is drawn under the flattened portion 37 of the spring arm 36, which springs up and clamps the end between itself and the throat plate as the hook on the thread holder 28 releases the thread. It is evident that if the end 40 of the needle thread were not confined in some way after it is released by the thread holder 28, it would be caught by the loops of the needle thread during successive stitches, making an unsightly appearance on the under side of the fabric, which is avoided by the construction shown.

The parts remain in the position shown in Fig. 3, until the beginning of the fourteenth stitch (the machine being arranged to make that number of stitches in sewing on a button, although any number of stitches may be provided for), when the parts shown in Fig. 3 begin to move back to the position shown in Fig. 1, which position they reach at the end of the fourteenth stitch. During this operation, the thread holder 28 pushes out the end 40 of the needle thread from under the part 37 of the spring arm 36, and the pointed ends of the knives 26 and 27 engage with the needle and shuttle threads, respectively, and as the machine stops the inertia of the parts gives a quick motion to the rod 42, which carries a rack engaging with the gear wheel 29. This motion is in the direction of the arrow shown in Fig. 1, and drives the needle and shuttle threads in the usual way.

After the threads have been severed, a spring, operating in the usual manner, restores the parts to their initial position, as shown in Fig. 1. During this cutting opera-

tion, as the parts are thrown in a counterclockwise direction from the position shown in Fig. 1, the heel 28 of the thread holder 28 passes from under the end 37 of the spring arm 36, and as the parts are retracted, under the influence of the aforesaid spring (not shown), the heel 28 of the thread holder, striking against the right hand part 38 of the end of the spring arm 36, has a tendency to throw this arm down, so as to cause it to come into the path of the rear end of the knife 27, but this action is prevented by the curved guard 31, which limits the forward motion of the end of the spring 36.

I claim:

1. In a thread severing and holding means, the combination with a throat plate, of movable means for severing the needle thread, a plurality of clamping parts, including a stationary part, for holding the severed end of the needle thread between them, a member having a thread carrying portion operating between said clamping parts for carrying the severed end of said thread between said parts, said clamping parts being located beneath the upper surface of the throat plate.

2. In a thread severing and holding means, the combination of a movable means for severing the thread, with a plurality of clamping members including a stationary member for holding a severed end, and a movable means attached to said severing means for bringing said severed end between said clamping members, said movable means also acting to eject said severed end from between said clamping members.

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

JOHN W. DARLEY, Jr.

Witnesses:
N. CURTIS LAMMOND,
A. W. NEALE, Jr.