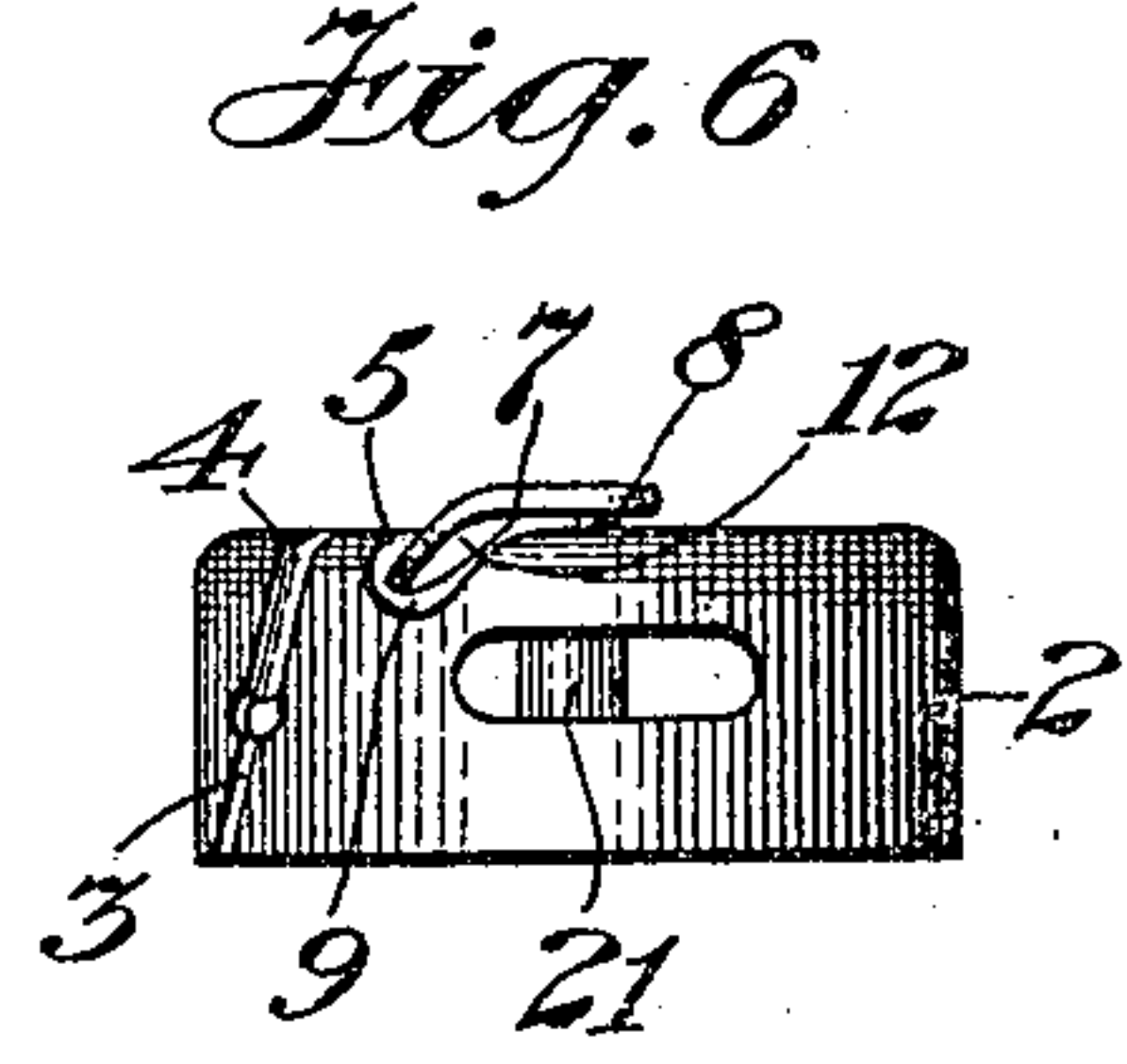
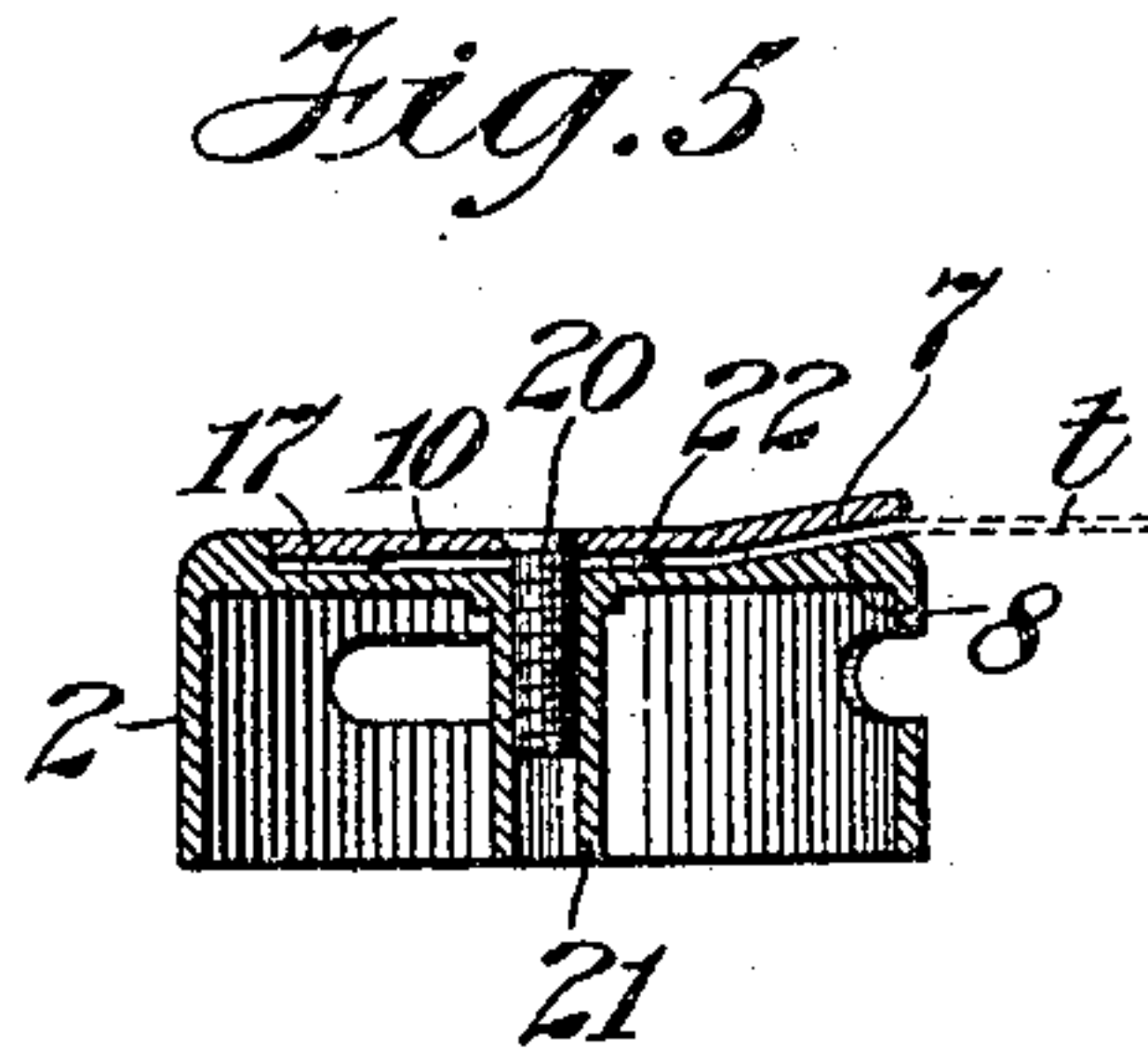
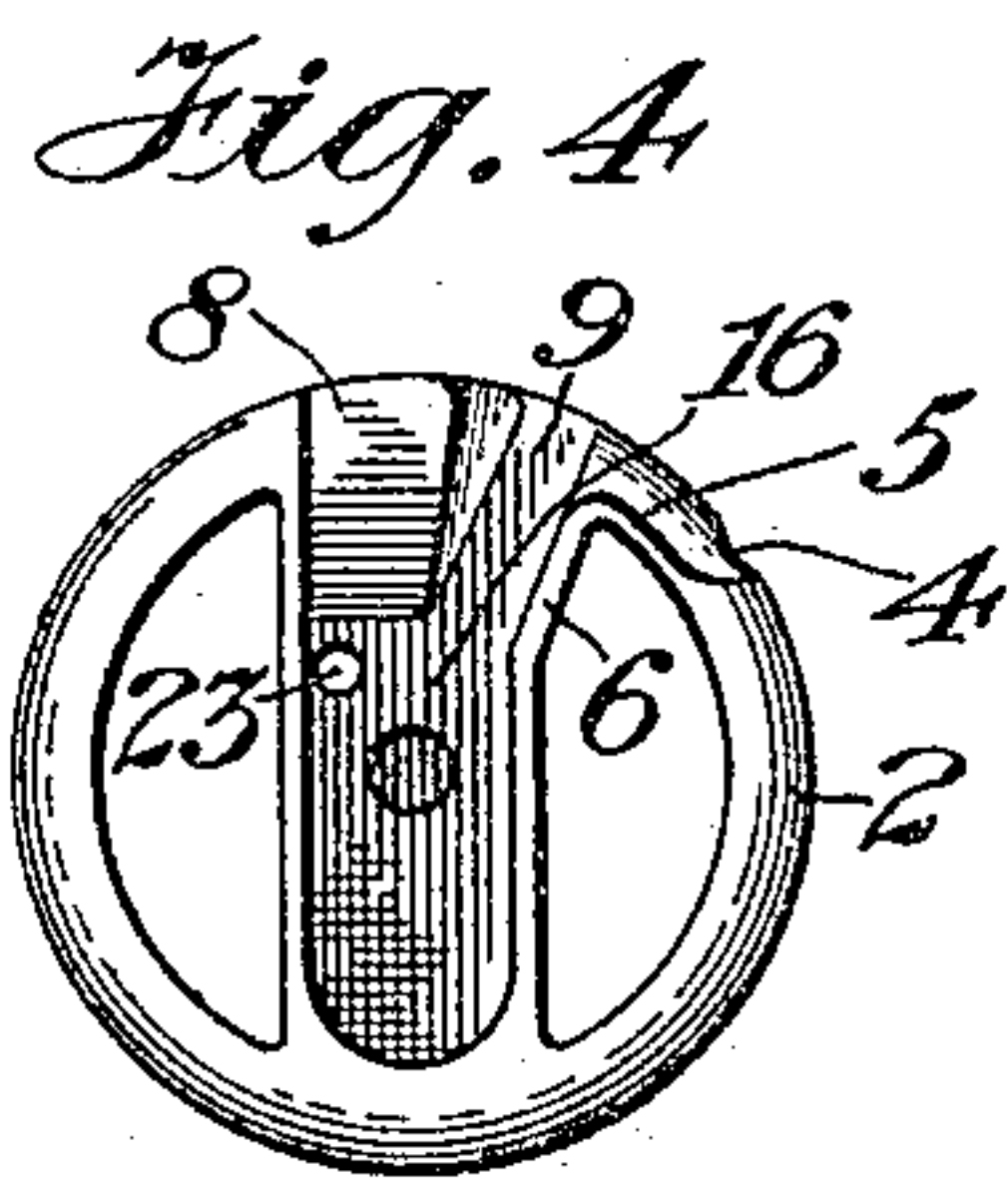
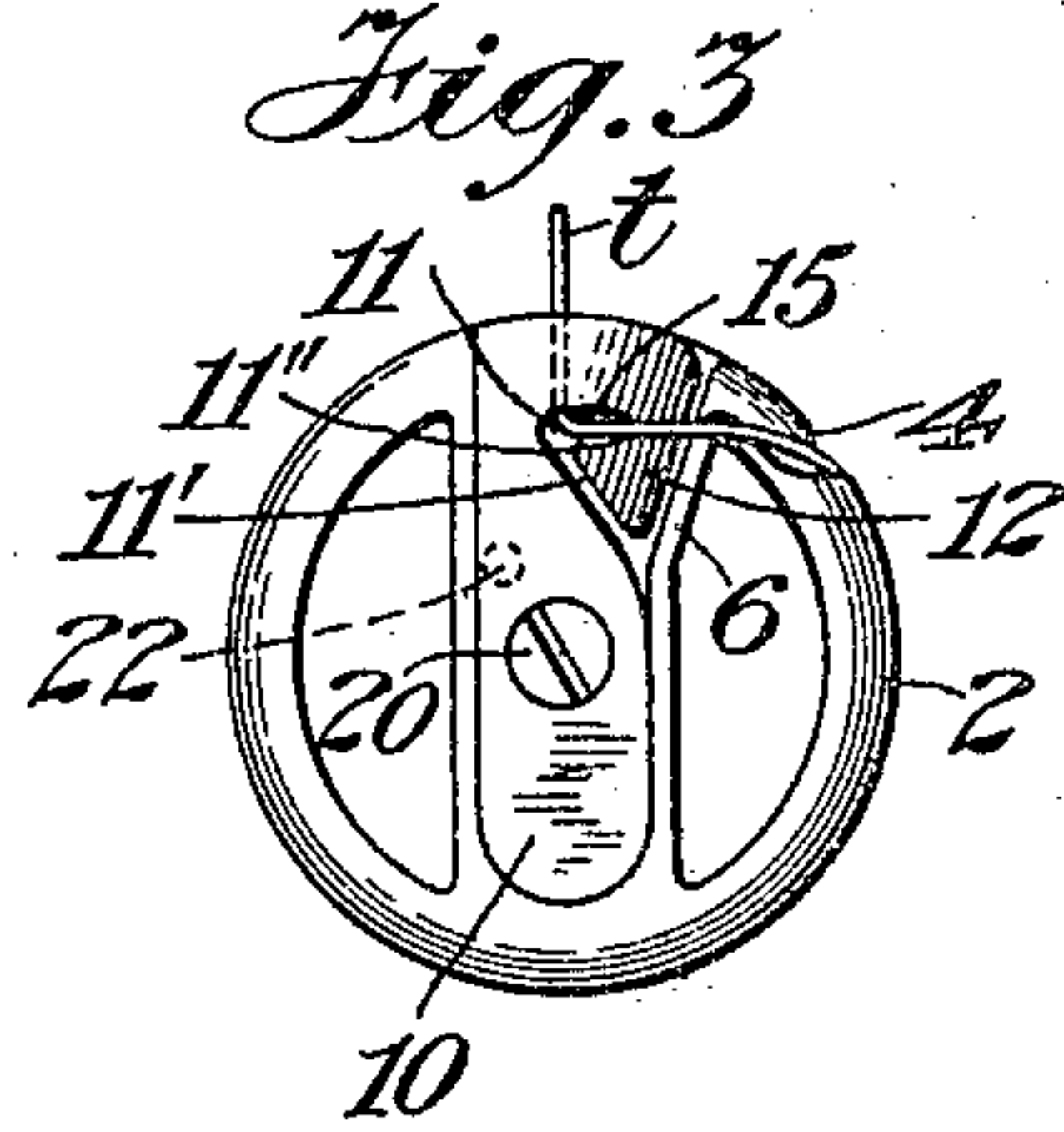
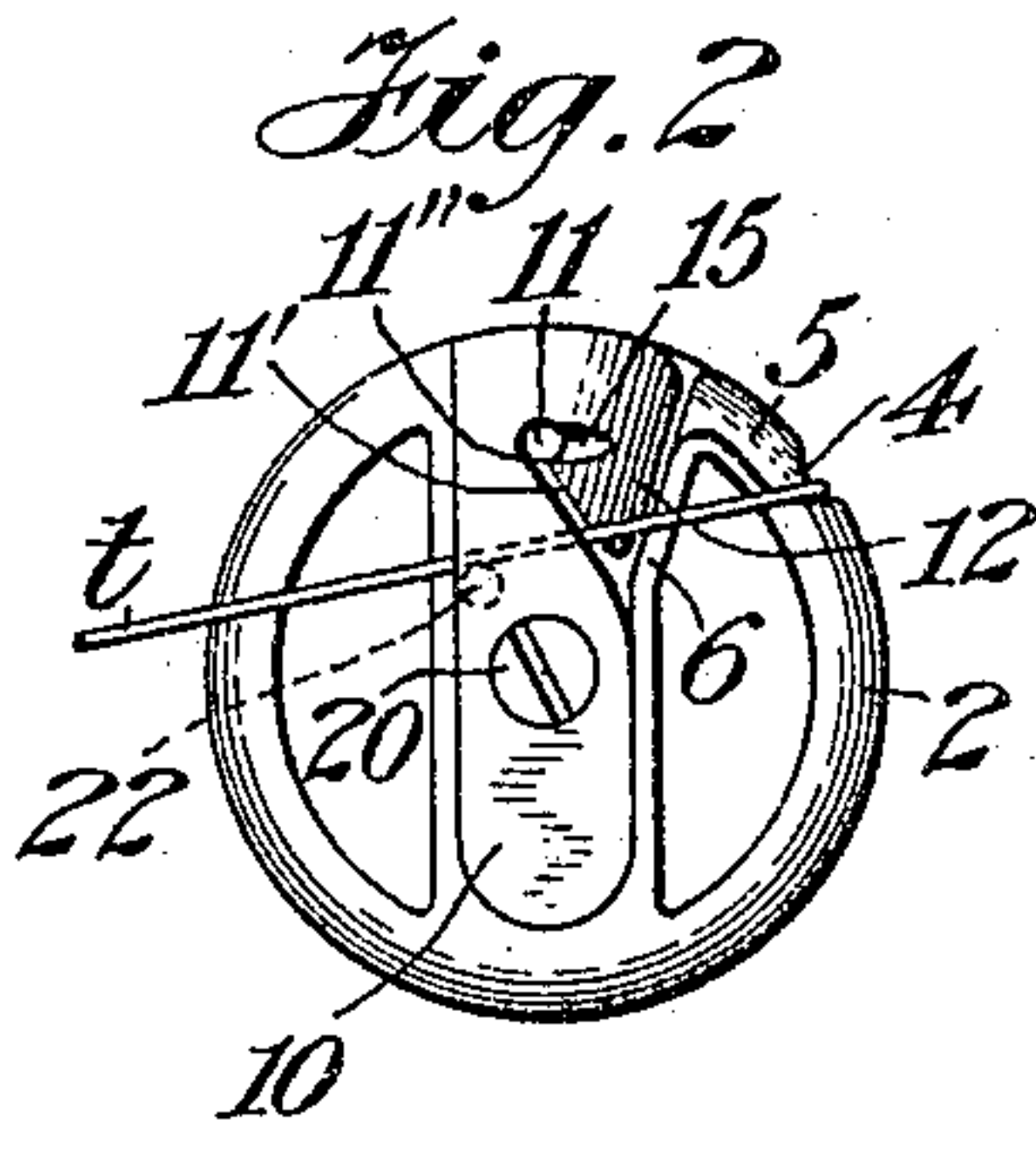
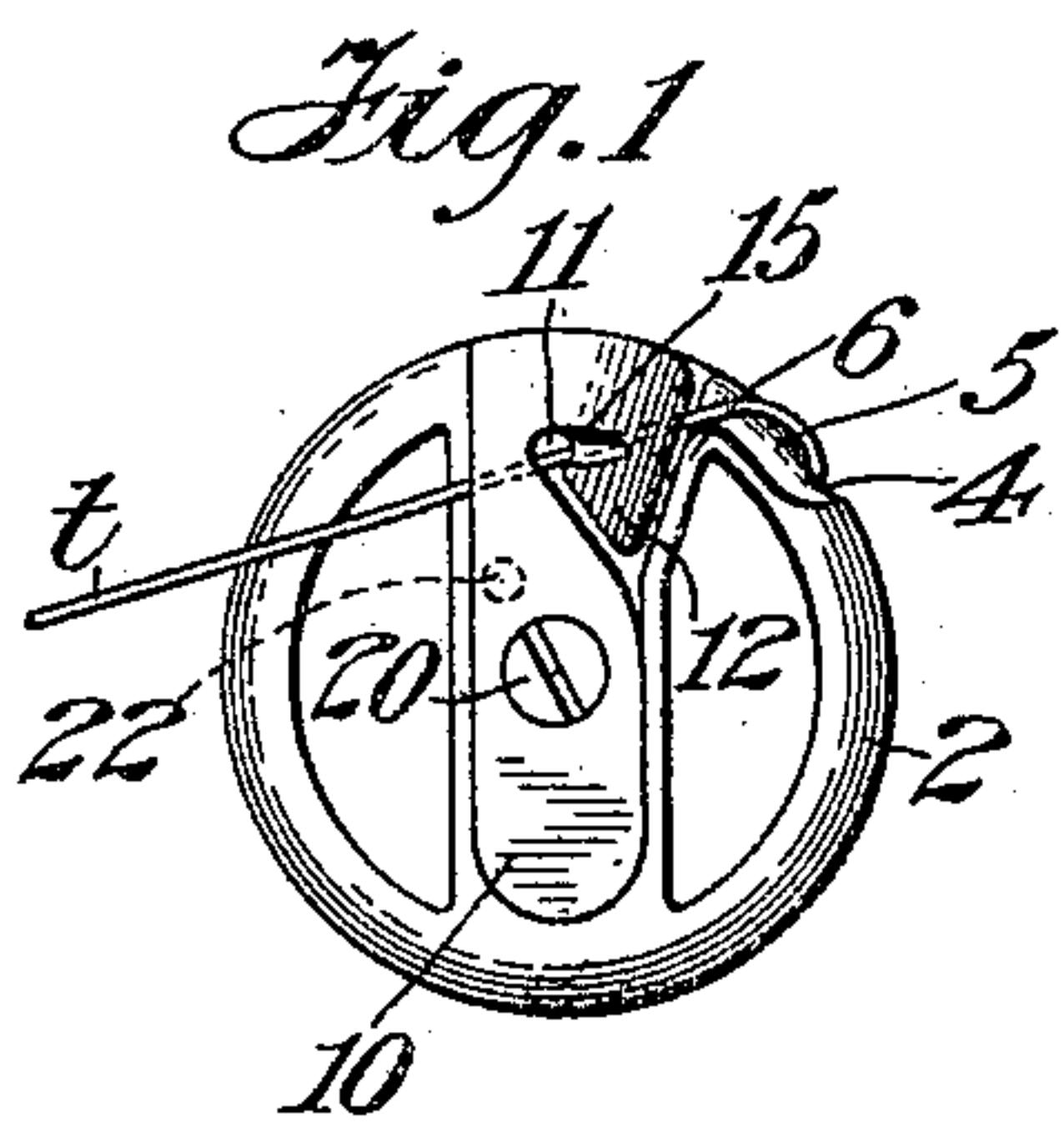


No. 819,688.

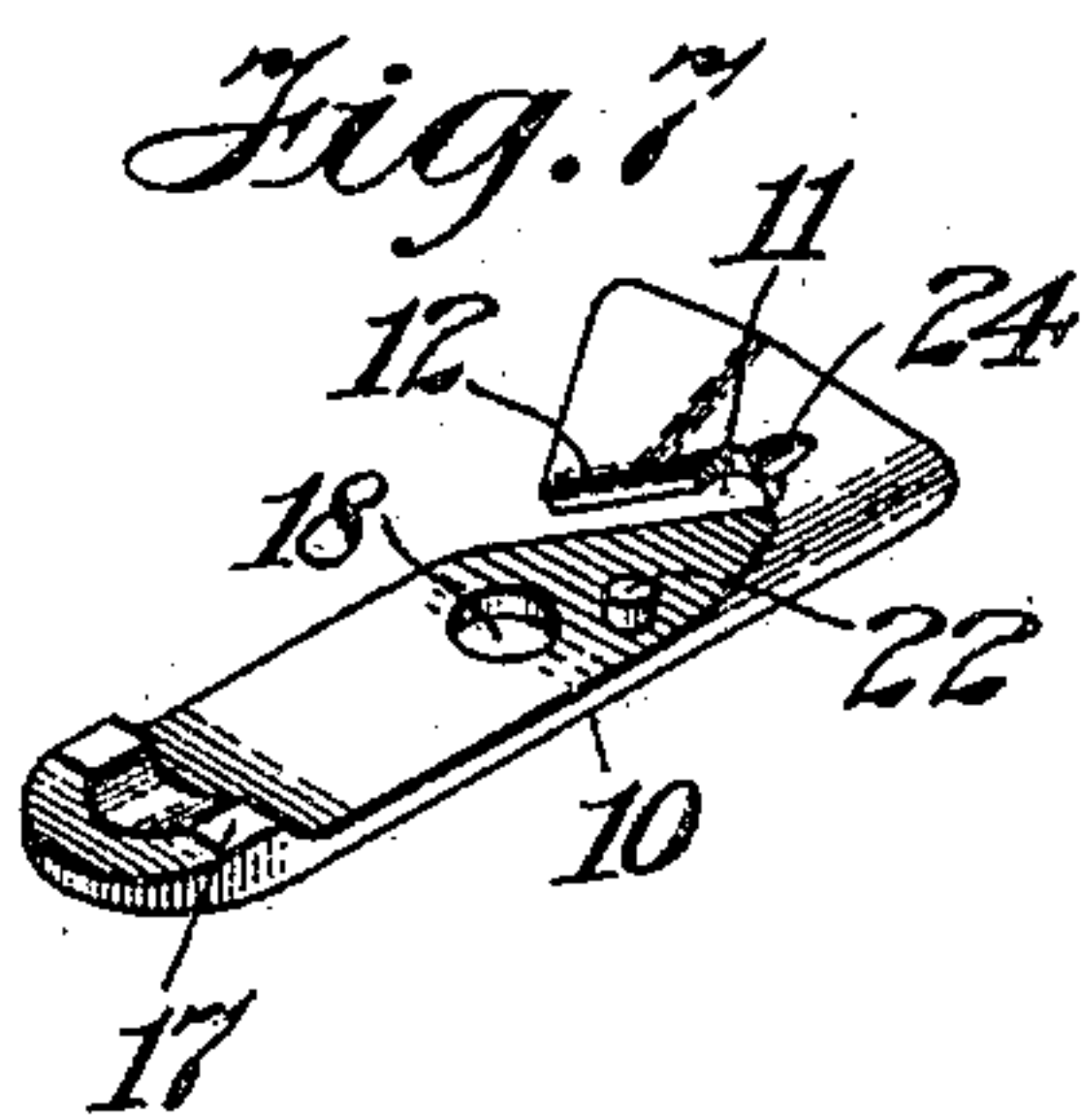
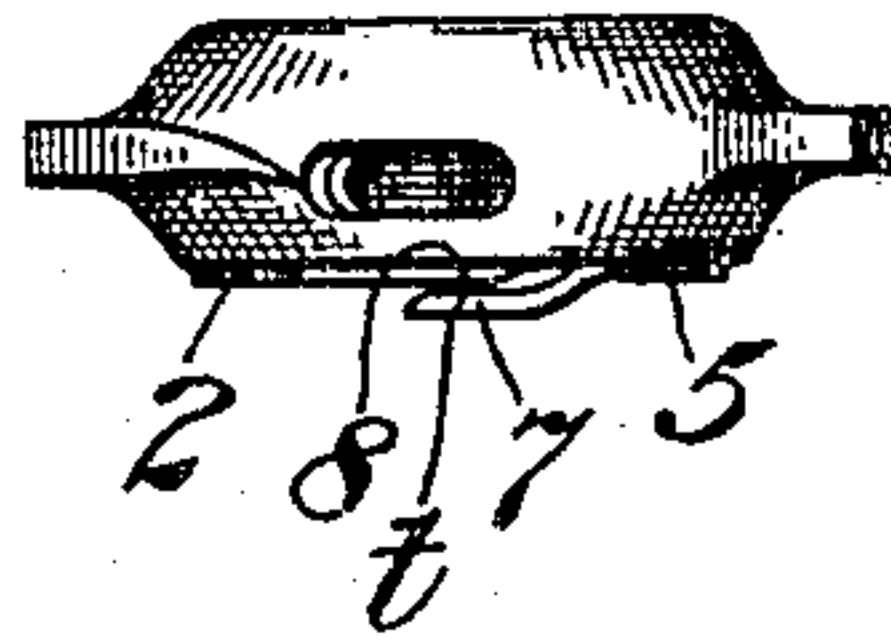
PATENTED MAY 1, 1906.

E. L. BOWERS.  
BOBBIN CASE FOR SEWING MACHINES.

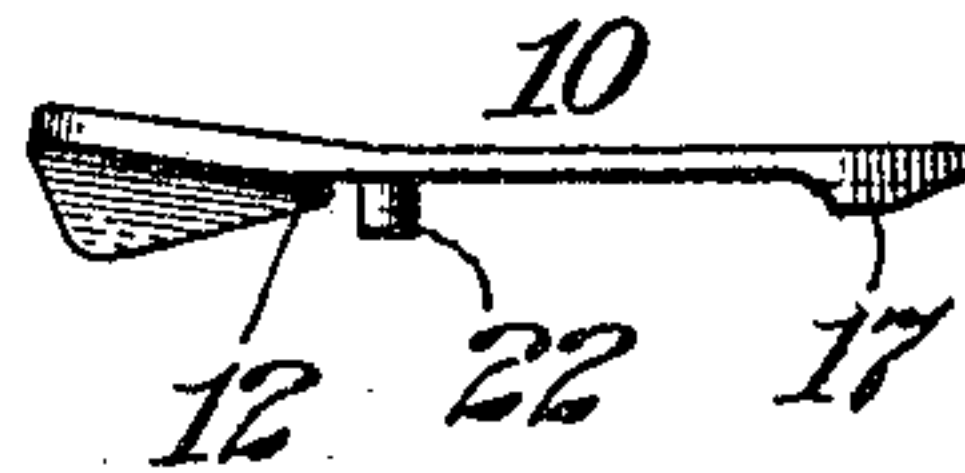
APPLICATION FILED DEC. 21, 1904.



*Fig. 9*



*Fig. 8*



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# UNITED STATES PATENT OFFICE.

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## BOBBIN-CASE FOR SEWING-MACHINES.

No. 819,688.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed December 21, 1904. Serial No. 237,793.

*To all whom it may concern:*

Be it known that I, EDWARD L. BOWERS, a citizen of the United States, and a resident of Orange, in the county of Franklin and State of Massachusetts, have invented certain new and useful Improvements in Bobbin-Cases for Sewing-Machines, of which the following is a specification.

This invention relates to bobbin-cases, and especially to the bobbin-thread-tensioning device carried by such cases for applying suitable tension to the bobbin-thread as it is wound off from the bobbin during the operation of sewing.

The principal object of the present invention is to provide a tension device of this class that can be threaded quickly and with certainty and the thread properly guided and tensioned after the device has been so threaded. This result is accomplished by providing a bobbin-case and a tension device or spring spaced at a suitable distance apart at the point where the thread is to be tensioned, this tension device having an open-sided eye and a hook at one side of this eye so constructed and positioned that when the bobbin-thread is brought down behind or at the inner side of the tension device and at the same time is maintained in contact with a guiding-surface of the bobbin-case it will slip over the point of the hook and be guided by the outer surface of the hook to its threaded position in the eye of the device. In order to accomplish this result, the point of the threading-hook must be in a plane behind or inside the adjacent portion of the guiding-surface of the bobbin-case.

Other features of the invention not hereinbefore referred to will be hereinafter described and are illustrated in the accompanying drawings, in which—

Figures 1, 2, and 3 are front elevations of a bobbin-case and tension device embodying my invention and illustrate the three positions assumed by the bobbin-thread in threading the device. Fig. 4 is a front elevation of the bobbin-case with the tension-spring removed. Fig. 5 is a central transverse section of the bobbin-case and tension-spring and illustrates the means for adjusting

the spring. Fig. 6 is an edge view of the bobbin-case and tension-spring looking toward the tensioning end of the spring. Fig. 7 is a perspective view of the tension-spring looking at the inner side of the same. Fig. 8 is an edge elevation of said tension-spring, showing how the central portion of the device is thinned to form a spring. Fig. 9 is an edge view of a shuttle with my improved bobbin-case contained therein.

Similar characters designate like parts in all the figures of the drawings.

The bobbin-case in most respects may be of any well-known construction and is designated generally by 2. It has in the periphery thereof the usual open-sided guide-slot 3 for the thread, which guide-slot is intersected in this case by a guide-groove 4, which in turn intersects and merges into a thread-guiding surface of the bobbin-case at the outer or forward face thereof, this thread-guiding surface being substantially convex at the edge of the bobbin-case, as indicated at 5, and being a plane surface at the face side of the bobbin-case, as indicated at 6. All of these surfaces 4, 5, and 6 of the bobbin-case are so shaped as to form a smooth surface over which the thread will pass to the eye of the tension device.

The tensioning of the bobbin-thread is effected by a pair of coacting tensioning-surfaces, one of which is on the bobbin-case proper and the other of which is on a tension device, such as a tension-spring, secured to the bobbin-case. These two tensioning-surfaces are indicated at 7 and 8, respectively. The tension-surface 8 on the bobbin-case is preferably formed about flush with the face of the latter, so as to cause the thread to be delivered from the bobbin-thread forward of and out of contact with the shuttle, as shown in Fig. 9. Between this tension-surface 8 and the guide-surface 5 a portion of the bobbin-case is removed to form a recess 9 of considerable size, this recess constituting a space for the free passage of the thread in threading the tension device and also permitting the free end or hook portion of the tension-spring to be bent back inwardly to bring the point of the threading-



hook in a plane behind the outer thread-guiding surface of the bobbin-case and also form a convex thread-guiding surface at the outer face of said hook. The said tension device may be of any suitable construction, but will preferably be a spring-arm, such as 10, reduced or thinned near the center thereof to make it properly resilient and so constructed at its tensioning end as to form an open-sided thread-receiving eye 11, with a thread-guiding hook 12 at one side of said eye and the open slot 11' leading thereto. This hook 12 is bent backward from the eye 11, as clearly indicated in the drawings, especially in Fig. 6, and this brings the point of the hook inside of the thread-guiding surface 6 of the bobbin-case, the surface 6 being that which is nearest the point of said hook. The result of forming the hook in this manner is that when the tension device is properly secured to the bobbin-case and the bobbin-thread *t* is brought down back of the free end of the tension device, as shown in Figs. 1 and 2, until it reaches the point of the hook 12 it will then immediately snap over or to a position in front of the outer surface of said hook, as seen in Fig. 2, because the point of said hook is in the rear of the surface 6, after which it may be drawn up to its final threaded position in the eye 11, as shown in Fig. 3. The open threading-slot 11', which communicates with the eye 11, is preferably arranged to open into the said eye at a point distant from that wall of the eye over which the thread normally draws, as shown in Fig. 3, and so provide a lower guard-wall 11'', which operates to prevent the thread from readily reëntering the slot 11' and becoming unthreaded or disengaged from the tension-spring, as might occur in the event of the thread becoming unduly slack between the bobbin and the eye 11.

The hook portion 12 of the tension-spring in being arranged at one edge in a plane behind the face of the adjacent portion of the bobbin-case, as hereinbefore described, not only serves to assure the proper threading of the tension-spring as described, but also assures the free passage of the needle-thread loop thereover without liability of obstruction. A further means is also afforded for positively assuring the unobstructed passage of the needle-thread loop across the face of the bobbin-case by the arrangement of the bobbin-thread in its passage from the surface 5 of the bobbin-case to the eye 11 of the tension-spring, as shown in Fig. 3, the thread in such position serving to bridge the space between the bobbin-case and the upper forwardly-projecting portion of the tension-spring and prevent the needle-thread loop from accidentally entering or becoming caught therein. The face of the hook 12 may have therein a thread-guiding groove, such as 15,

which intersects the eye 11 and is substantially in line with the groove 4 in the bobbin-case.

The construction of the preferred form of tension device or spring and the manner in which it is secured to the bobbin-case are clearly illustrated in the drawings. In this construction the bobbin-case has a countersunk guideway or recess 16 in the forward face thereof and extending diametrically substantially across the bobbin-case. The tension device or spring 10 is mounted in this countersunk guideway or recess and is approximately of the same shape. At its inner end the tension-spring 10 has a thickened portion 17 so formed as to constitute feet for elevating the major portion of the spring and spacing it away from the adjacent surface of the bobbin-case. Near its center the spring has an opening 18 therein, through which a holding device, such as the adjusting-screw 20, may be passed, this screw being tapped in the present case into the spindle 21 of the bobbin-case. By means of this screw the tension-spring 10 may be held in place in the countersink 16 of the bobbin-case and its tensioning position with respect to the adjacent surface of the bobbin-case adjusted as may be desired. In the construction shown the tension-spring has a pin 22 at its inner side which enters a perforation 23 in the bobbin-case and operates as a stop to the thread in the threading operation, as shown in Fig. 2, so as to prevent the thread being drawn down too far between the tension-spring and the adjacent wall of the bobbin-case and becoming caught or wedged therebetween. The tension-spring also has in its inner side a thread-guiding groove or recess 24, which intersects the eye 11 in the same manner as the corresponding groove 15, but is located at a different angular position, being substantially radial with respect to the center of the bobbin.

The bobbin-case and tension-spring herein described constitute a very simple and efficient means for regulating the tension for thread of any size and also assures the positive threading of the device when the thread is brought down behind the hook 12 in the manner hereinbefore described, as the point of said hook is so positioned with respect to the cooperative thread-guiding surface 6 of the bobbin-case that the thread will always snap over the point of said hook.

What I claim is—

1. The combination with a bobbin-case having a thread-guiding surface, of a tension device having an open-sided thread-guiding eye and also having at one side of said eye a threading-hook the point of which is arranged in a plane behind that of the adjacent portion of the thread-guiding surface of the bob-



bin-case; the said tension device being arranged on the bobbin-case with a threading-space thereunder opening beneath one end of the tension device and extending to a point  
5 past the end of its threading-hook.

2. The combination with a bobbin-case having a thread-guiding surface, of a tension-spring having an open-sided thread-guiding eye and also having at one side of said eye a  
10 threading-hook arranged in a plane behind that of the adjacent portion of the thread-guiding surface of the bobbin-case; the said tension-spring arranged on the bobbin-case with a threading-space thereunder opening  
15 beneath one end of the tension-spring and extending to a point past the end of its threading-hook.

3. The combination with a cylindrical bobbin-case having a face-wall provided with a  
20 thread-guiding surface, of a tension device located on the said face-wall of the bobbin-case with one end adjacent to the peripheral edge thereof and having an open-sided thread-guiding eye and also having at one side of  
25 said eye a threading-hook the point of which is arranged in a plane behind that of the adjacent portion of the thread-guiding surface of the bobbin-case; the said tension device being arranged on the bobbin-case with a  
30 threading-space thereunder opening beneath that end of the tension device adjacent to the periphery of the bobbin-case and extending to a point past the end of its threading-hook.

4. The combination with a cylindrical bobbin-case having a face-wall provided with a  
35 thread-guiding surface, of a tension device located on the said face-wall of the bobbin-case with one end adjacent to the peripheral edge thereof and having an open-sided thread-guiding eye and also having at one side of  
40 said eye a threading-hook the point of which is arranged in a plane behind that of the adjacent portion of the thread-guiding surface of the bobbin-case and the outer thread-guiding surface of which is convex and has a  
45 guide-groove intersecting said eye in which the thread normally lies; the said tension device being arranged on the bobbin-case with a threading-space thereunder opening beneath that end of the tension device adjacent  
50 to the periphery of the bobbin-case and extending to a point past the end of its threading-hook.

5. The combination with a cylindrical bobbin-case having a face-wall provided with a  
55 thread-guiding surface, of a tension-spring secured intermediate its ends to the said face-wall of the bobbin-case and spaced away from the bobbin-case at its thread-tensioning end and having an open-sided thread-guiding  
60 eye at said tensioning end and also having at one side of said eye a threading-hook the point of which is arranged in a plane behind

that of the adjacent portion of the thread-guiding surface of the bobbin-case; the said  
65 tension-spring being arranged on the bobbin-case with a threading-space thereunder opening beneath its thread-tensioning end and extending to a point past the end of its threading-hook.  
70

6. The combination with a cylindrical bobbin-case having a face-wall provided with a thread-guiding surface and also having a  
tapped bobbin-spindle, of a tension-spring having a substantially central opening and  
75 spaced away from the bobbin-case at its thread-tensioning end and having an open-sided thread-guiding eye at said tensioning end and also having at one side of said eye a  
threading-hook the point of which is arranged in a plane behind that of the adjacent  
80 portion of the thread-guiding surface of the bobbin-case, and a screw passed through said opening in the tension-spring and into said  
tapped spindle; the said tension-spring being  
85 arranged on the bobbin-case with a threading-space thereunder opening beneath its thread-tensioning end and extending to a point past the end of its threading-hook.

7. The combination with a bobbin-case  
90 having a thread-guiding surface, of a tension device having an open-sided thread-guiding eye and also having at one side of said eye a  
threading-hook the point of which is arranged in a plane behind that of the adjacent  
95 portion of the thread-guiding surface of the bobbin-case; the said tension device being arranged on the bobbin-case with a threading-space thereunder opening beneath one end  
100 of the tension device and extending to a point past the end of its threading-hook, and means for engaging with and limiting the movement of the thread subsequent to its passage beyond the threading-hook during the thread-  
105 ing operation.

8. The combination with a cylindrical bobbin-case having a face-wall provided with a  
thread-guiding surface, of a tension device attached to the said face-wall of the bobbin-  
110 case and having an open-sided thread-guiding eye, and also having at one side of said eye a threading-hook the point of which is arranged in a plane behind that of the adjacent  
portion of the thread-guiding surface of the  
115 bobbin-case; and means for guiding the bobbin-thread across the outer face of said  
threading-hook from the peripheral wall of the bobbin-case to the said thread-guiding  
eye of the tension device and in a direction  
120 substantially at right angles to the path of the thread from the said thread-guiding eye to the work, the said eye being formed with a lower guard-wall extending beneath the thread in its passage therethrough, for the  
purpose set forth.  
125

9. The combination with a bobbin-case



having a countersink or recess in its face-wall  
one edge of which constitutes a thread-guid-  
ing surface, of a tension device located in said  
recess and having an open-sided thread-guid-  
5 ing eye and also having at one side of said eye  
a threading-hook arranged in a plane behind  
that of the adjacent portion of the said  
thread-guiding surface; the said tension de-  
vice being arranged on the bobbin-case with  
10 a threading-space thereunder opening be-

neath one end of the tension device and ex-  
tending to a point past the end of its thread-  
ing-hook.

Signed at Orange, in the county of Frank-  
lin and State of Massachusetts, this 10th day 15  
of December, A. D. 1904.

EDWARD L. BOWERS.

Witnesses:

W. P. CONRAD,  
WILLIAM W. WATERS.