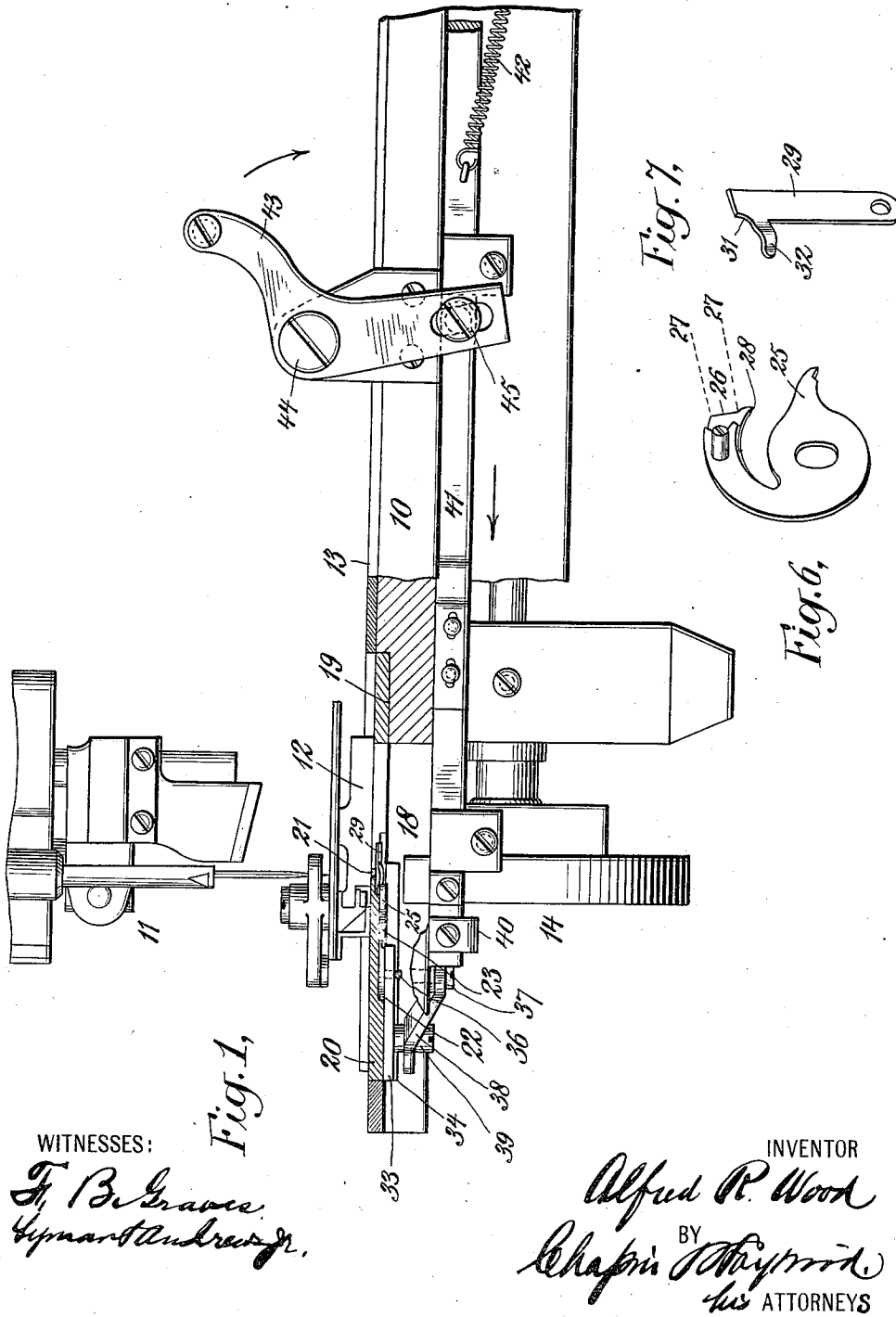


A. R. WOOD.
 THREAD TRIMMING MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED FEB. 6, 1911.

1,013,252.

Patented Jan. 2, 1912.

2 SHEETS-SHEET 1.



WITNESSES:
F. B. Graves
Symant Andrews Jr.

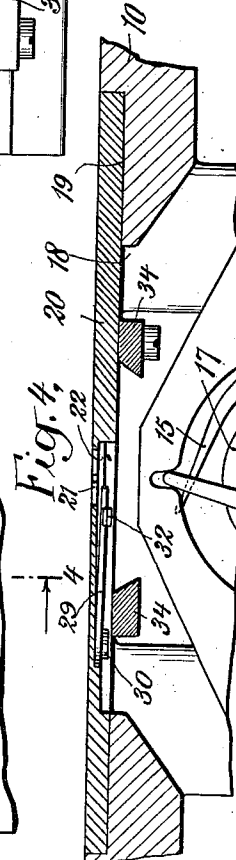
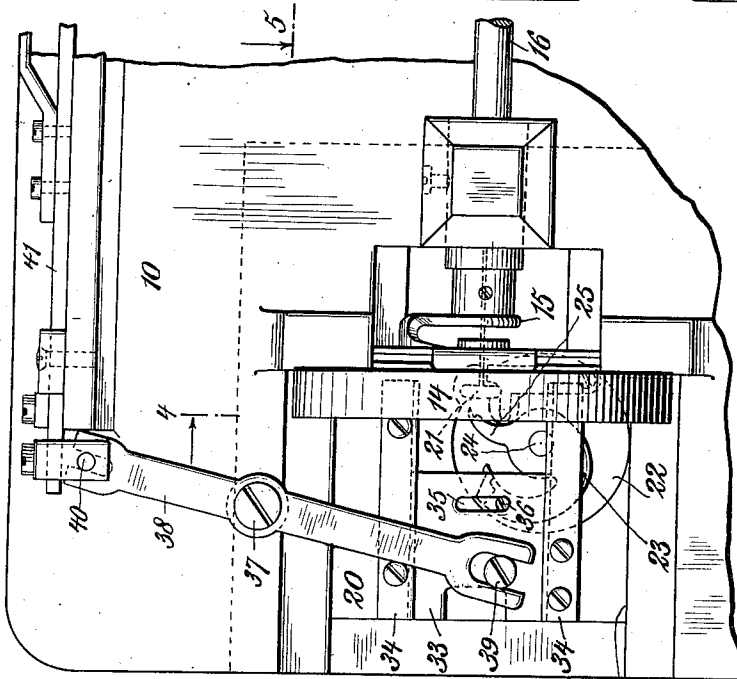
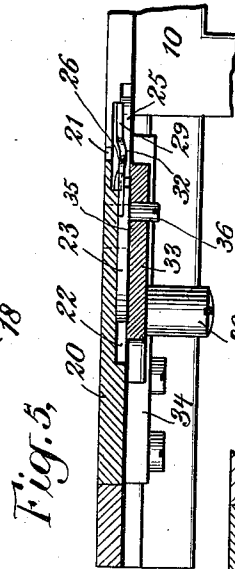
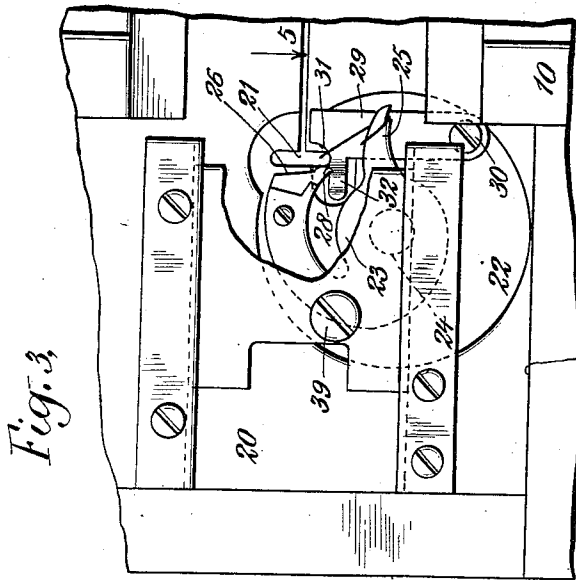
INVENTOR
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 ATTORNEYS

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2 SHEETS—SHEET 2.



WITNESSES:

J. B. Lewis
 Leonard Andrews

Fig. 2,

INVENTOR
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UNITED STATES PATENT OFFICE.

ALFRED R. WOOD, OF TROY, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SINGER MANUFACTURING COMPANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY.

THREAD-TRIMMING MECHANISM FOR SEWING-MACHINES.

1,013,252.

Specification of Letters Patent.

Patented Jan. 2, 1912.

Application filed February 6, 1911. Serial No. 606,692.

To all whom it may concern:

Be it known that I, ALFRED R. WOOD, a citizen of the United States of America, and a resident of Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Thread-Trimming Mechanism for Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to thread trimming mechanism for sewing machines, and particularly to mechanism for trimming the under thread of lock stitch machines employing upper and lower thread mechanism.

The main objects of my invention are to secure a compact structure, in which a portion of the lower thread is paid off from the bobbin or other device from which the lower thread is supplied prior to the thread cutting operation, in which the thread is severed as close as possible to the work, and in which the parts constituting the thread looping or paying off mechanism and the thread cutting mechanism proper, occupy a minimum of vertical space.

To these ends my invention consists in certain novel details of construction and combinations of parts as will be presently pointed out, and other objects of my invention such as follow as a result of such details of construction and combinations of parts will be fully understood in the light of the following description.

I will now proceed to describe in detail a construction constituting an embodiment of my invention having reference to the accompanying drawings illustrating the same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in part side elevation and part central longitudinal section of a portion of a sewing machine in which a thread trimming device constructed in accordance with my invention is employed. Fig. 2 is an under-side view of certain parts thereof showing particularly the thread trimming device and parts of the operating means therefor. Fig. 3 is a detail view upon a somewhat larger scale showing particularly the thread trimming device, the parts thereof being shown in a different position from that in which they are shown in Fig. 2. Fig. 4 is a detail

view in transverse section upon the plane of the line 4—4 in Fig. 2. Fig. 5 is a view in longitudinal section of the parts shown in Fig. 3, the plane of section being indicated by the line 5—5 in such figure. Fig. 6 is a detail view in perspective of the oscillatory element which carries the movable cutter. Fig. 7 is a detail view in perspective of the relatively stationary cutter employed.

The portion of the sewing machine shown includes parts of the usual bed plate 10, upper thread mechanism 11, work clamp 12, plate 13 for carrying the work clamp 12, and under-thread mechanism 14. The latter includes an oscillating looper 15 carried by a suitably driven undershaft 16 (see Figs. 2 and 4), and a bobbin 17, a portion of which is shown in Fig. 4. These parts are well known and detailed illustration thereof is unnecessary; they may, for instance, be of the ordinary type employed in the well known "National" machine. At its forward end the bed plate has a rectangular opening 18 therein, and a recessed portion 19 surrounding the opening 18, to which is fitted a throat plate 20, the said throat plate having a needle receiving opening 21 therein through which the needle may descend for coöperation with the under-thread mechanism. This throat plate has a substantially cylindrical recess therein upon the under side thereof as shown, the same being arranged to receive an oscillatory element 23 which is pivotally mounted upon a central stud 24 within the said recess. The element 23 has a radially projecting arm 25 constituting a looper and a part 26 constituting a cutting knife. The cutting knife 26, in addition to its cutting edge which extends between the parts indicated by the dotted lines 27—27 in Fig. 6, has a forwardly projecting portion 28 the rear edge of which is curved. This forwardly projecting curved portion 28 constitutes a lead for insuring the proper coaction of the movable cutting knife 26 with a stationary cutting blade as will presently be explained. A blade 29 is also located in the said recess 22 in the throat plate, being conveniently secured thereto by means of a screw stud 30 at one end thereof. The opposite end of the blade 29 has a curved cutting edge 31, and the said blade also has a finger 32 which projects laterally therefrom

and in addition has a portion offset transversely therefrom which, by reference to Figs. 2 and 3, will be seen to be in the path of movement of the looper arm 25 of the element 23. This blade 29 with its cutting edge 31 constitutes a cutting element which is relatively stationary with respect to the cutting knife 26 of the movable element 23, but while relatively stationary in this respect the said blade may be laterally elevated through a short distance as will now be explained. In the form shown the blade 29 is of spring material and in its normal condition the free end thereof is inclined downward slightly as clearly appears in Fig. 4 of the drawings. At this time the oscillatory element 23 is in its normal rest position as shown in Fig. 2. When, however, this element is actuated in a thread trimming operation as will presently be described, the arm 25 will move into engagement with the finger 32 and will force inward the free end of the blade 29, lifting it from the inclined position in which it is shown in Fig. 4, to substantially a horizontal position. By this means the arm 25 which is in the same plane with the cutting knife 26 will pass freely over the cutting edge 31 of the blade 29 so that there will be no danger of a cutting action between the looper and the said stationary cutting edge. Thereafter upon the continued movement of the element 23 the looper will pass beyond the finger 32 and the blade 29 will spring back to its normal inclined position, and upon the further movement of the element 23 the movable cutting knife 26 will come into engagement with the stationary cutting edge 31 to effect a cutting operation. The lead portion 28 of the cutter is arranged to strike the edge of the blade 29 just before the cutting edges come into engagement in order to insure proper registry of the cutting edges. Such an arrangement also permits the normal position of the cutting edge 31 to be just beneath the plane of the cutting edge of the knife 26 so that after the lead portion 28 has very slightly deflected the blade 29, there will be a sufficient spring action of the cutting edge 31 of the blade 29 against the cutting edge of the knife 26 of the element 23 to insure a proper and clean cutting operation.

The operating means for the element 23 is as follows. A sliding plate 33 is mounted immediately beneath the throat plate 20, being guided in longitudinal guides 34 provided for the purpose. This sliding plate has a slot 35 therein which is arranged to receive a stud 36 carried by the arm of the element to which the knife 26 is secured. Mounted beneath the bed plate 10 upon a stationary pivot 37 is a rocking lever 38, one end of which is connected by a slot and pin connection 39 with the sliding plate 33,

and the other end of which is connected by a similar slot and pin connection 40 with a longitudinal slide rod 41. The slide rod 41 is suitably guided in the bed plate 10 and is moved in one direction by a spring 42. An operating arm 43 suitably mounted upon a stationary pivot pin 44, is provided for moving the sliding rod or bar 41 in the opposite direction against the tension of the spring 42, the said operating arm having a pin and slot connection 45 with the said slide rod 41, as is clearly shown in Fig. 1. The pivot pin 44 is conveniently supported by a bracket mounted upon the bed plate 10. When it is desired to effect a thread trimming operation the operating arm 43 is moved by any suitable means in the direction of the arrow in Fig. 1, the effect of which is to move the slide rod 41 to the left as viewed in Fig. 1, and to reverse the position of the rocking lever 38 from that in which it is shown in Fig. 2. This moves the slide plate 33 to the right from the position shown in Fig. 2, the position shown in Fig. 2 being it is understood the normal rest position of the parts, and in such movement the element 23 will be moved in a clockwise direction as viewed in Fig. 2. The extremity of the looper arm 25 is arranged to move into the path of the bobbin thread and to carry the bobbin thread with it, as appears in Fig. 3. As has been previously explained the looper arm will, in such movement, pass over the finger 32 so as to force the blade 29 out of its path so that there will be no danger of cutting the thread at this time. The effect of this loop will be to pay off a sufficient amount of the bobbin thread so that after severance and upon a later stitching operation there will be sufficient thread to coact with the needle thread mechanism as will be well understood. After the element 23 has moved to a degree sufficient to pay off enough of this bobbin thread, the movable cutting knife 26 will reach the relatively stationary cutting edge 31, the lead portion 28 just previously to this time engaging the blade 29 as has been above stated, the parts in Fig. 3 being shown in the position where this lead portion is just engaging the blade 29 for this purpose, and a severing of the thread will occur by the coaction of the said movable and stationary cutting edges as will be well understood. Thereafter upon release of the operating arm 43 the spring 42 will return the parts to their normal position as shown in Fig. 2, and the machine will be ready for another sewing operation.

By the foregoing arrangement and construction of parts it will be seen that I have provided a cutting device which takes up but very little room in the machine. The oscillatory device including the looper and the movable cutting blade is a thin, flat piece

of metal which is received within a shallow recess in the throat plate, and the stationary cutting blade is likewise a thin, flat portion such as is similarly received in this recess. 5 The cutting is effected so near the position in which the work is held (it being understood that the work rests immediately upon the throat plate 20) that the under-thread is severed quite close to the work. The construction and arrangement of the parts is 10 such, moreover, as to insure an effective cutting operation even after the cutting knives or blades have lost their keen cutting edges. The arrangement of the looper and cutting 15 edges in the same plane, together with means by which the stationary blade is deflected when the looper passes thereover, permits an exceedingly compact structure while absolutely avoiding the possibility of the thread 20 being severed by any coaction of the looper with the cutting edge of the said stationary blade.

What I claim is:

1. An under-thread trimming device comprising an oscillatory element provided with a cutting blade and a looper arranged 25 angularly in advance of the cutting blade and in the same horizontal plane, a relatively stationary cutter blade arranged in the path of the looper and movable cutting 30 blade, means for oscillating the said element, and means for deflecting the relatively stationary blade as the looper passes thereover.

2. An under-thread trimming device comprising an oscillatory element provided with a cutting blade and a looper arranged 35 angularly in advance of the cutting blade and in the same horizontal plane, a relatively stationary blade in the path of movement of the looper and movable blade, and 40 means for oscillating the said element, the said relatively stationary blade having a projection which is adapted to be engaged by the looper in the rotative movement 45 thereof, whereby the relatively stationary blade will be deflected by the looper as the said looper passes thereover.

3. An under-thread trimming device comprising an oscillatory element provided 50 with a cutting blade and a looper arranged angularly in advance of the cutting blade and in the same horizontal plane, a relatively stationary blade formed of resilient

material, the said blade being secured fast 55 at one end and having a cutting edge for coaction with the movable cutting blade at its other and free end, and means for oscillating the said element, the said relatively stationary blade having a projection arranged for coaction with the looper in its 60 movement, whereby as the looper passes over the stationary blade the portion thereof having the cutting edge will be deflected out of the path of the looper and will 65 spring back by its own resilience after the looper has passed away therefrom, to a position ready for engagement with the movable cutting blade.

4. In a sewing machine, the combination 70 of a throat plate having a recess in the under side thereof, a flat oscillating element pivotally mounted in the said recess, the underside whereof is substantially flush with the under side of the said throat plate, 75 the said element having a cutting blade and a looper arranged angularly in advance of the cutting blade and in the same horizontal plane, a relatively stationary cutting blade 80 also arranged in the said recess in the throat plate and in the path of movement of both the looper and the movable cutting blade, means for oscillating the said element, and means for deflecting the said stationary 85 blade as the looper passes thereover.

5. In a sewing machine, the combination with a throat plate having a recess in the under side thereof, a flat oscillatory element pivotally mounted in such recess and 90 having a cutting blade and a looper arranged angularly in advance of the cutting blade and in the same horizontal plane, a relatively stationary blade also arranged in the said recess and in the path of movement of both the looper and the movable cutting 95 blade, and means for deflecting the said stationary blade as the looper passes thereover, of a reciprocating slide plate mounted immediately beneath the throat plate and 100 operatively connected to the said oscillatory element, guides for the said slide plate, and operating means for reciprocating the said slide plate.

ALFRED R. WOOD.

Witnesses:

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HENRY M. CARPENTER.