

No. 794,669.

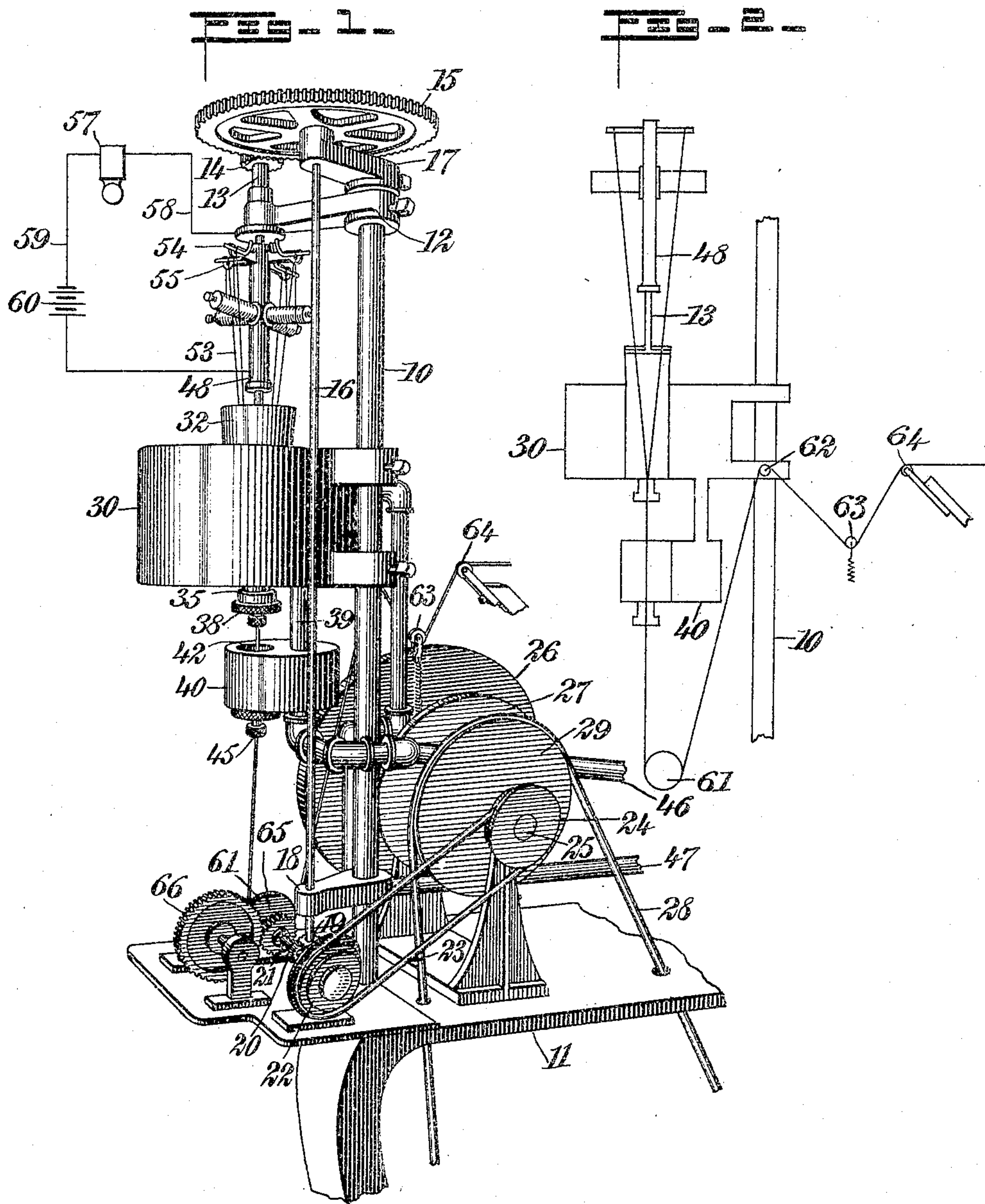
PATENTED JULY 11, 1905.

A. H. FORSYTHE.

THREAD TWISTING AND WAXING MACHINE.

APPLICATION FILED APR. 9, 1904. RENEWED JUNE 17, 1905.

2 SHEETS—SHEET 1.



WITNESSES:

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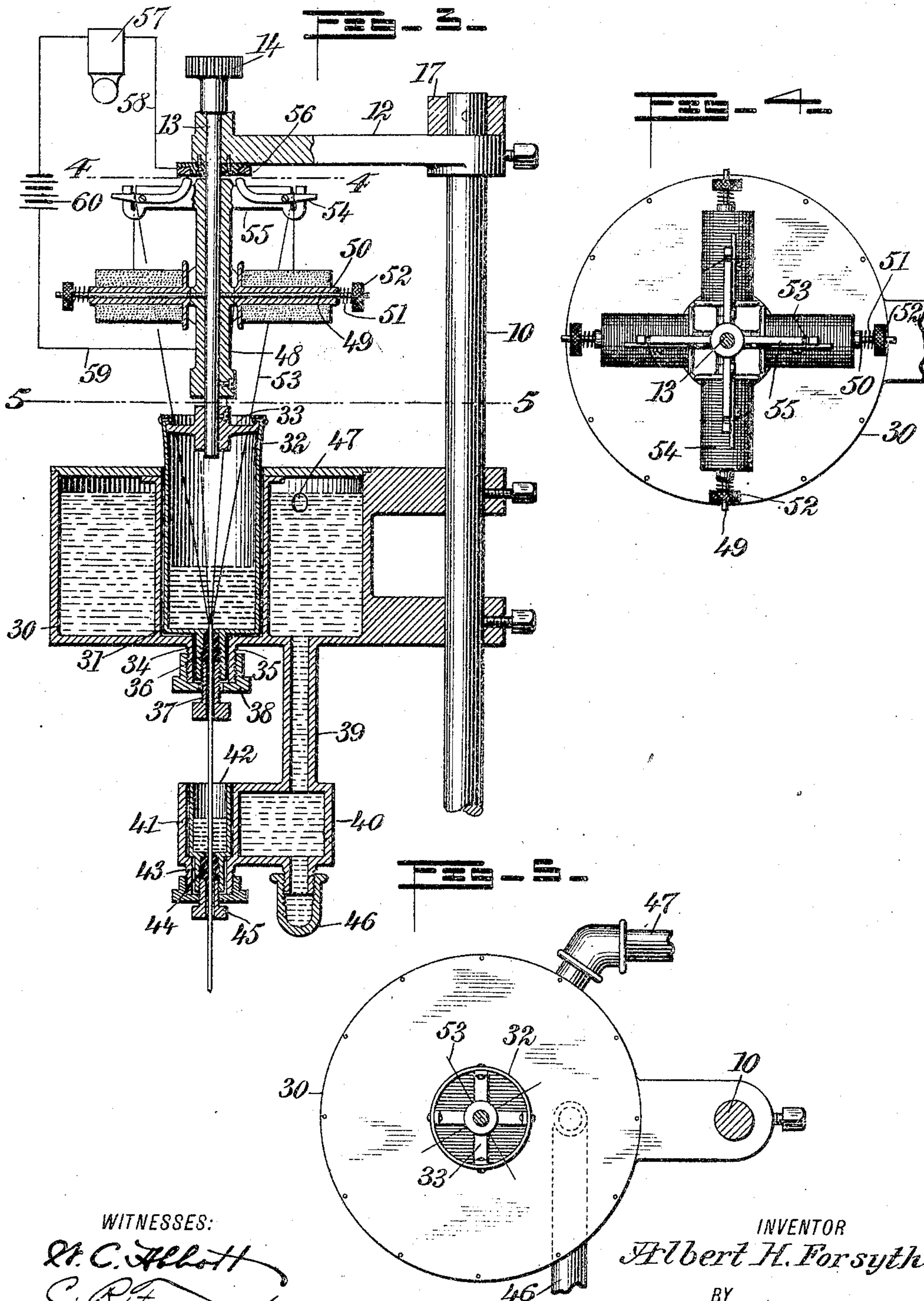
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# UNITED STATES PATENT OFFICE.

ALBERT HARRIS FORSYTHE, OF SARCOXIE, MISSOURI.

## THREAD TWISTING AND WAXING MACHINE.

SPECIFICATION forming part of Letters Patent No. 794,669, dated July 11, 1905.

Application filed April 9, 1904. Renewed June 17, 1905. Serial No. 265,811.

*To all whom it may concern:*

Be it known that I, ALBERT HARRIS FORSYTHE, a citizen of the United States, and a resident of Sarcoxie, in the county of Jasper and State of Missouri, have invented a new and Improved Thread Twisting and Waxing Machine, of which the following is a full, clear, and exact description.

This invention relates particularly to improvements in machines for twisting together a plurality of threads and waxing the same for use in a leather-sewing machine, an object being to provide a machine for this purpose that will be simple in construction, positive in action, and that may be readily attached to a sewing-machine.

I will describe a thread twisting and waxing machine embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of a thread twisting and waxing machine embodying my invention. Fig. 2 is a diagrammatic view illustrating the course of the thread. Fig. 3 is a sectional elevation of the machine. Fig. 4 is a section on the line 4 4 of Fig. 3, and Fig. 5 is a section on the line 5 5 of Fig. 3.

Referring to the drawings, 10 designates a standard extended upward from the bed-plate 11 of a sewing-machine. Attached to the upper end of the standard is an arm 12, forming a bearing for a shaft 13, on the upper end of which is a pinion 14, meshing with a gear-wheel 15 on a shaft 16, which has bearings in arms 17 18 attached to the standard 10. The lower end of the shaft 16 has attached to it a bevel-pinion 19, meshing with a bevel-pinion 20, arranged on a shaft 21, and on the shaft 21 is a cone-pulley 22, from which a band 23 extends to a cone-pulley 24 on a counter-shaft 25, and on this counter-shaft is a balance-wheel 26 and a cam-wheel 27 for operating the handle-bar of a sewing-machine in the usual manner. By means of the cone-pulleys 22 24 the speed of the driving-wheel 15 may be regulated, and consequently regu-

late the speed of the twisting mechanism, to be hereinafter described.

Motion is imparted to the shaft 25 by means of a driving-belt 28 engaging with a pulley 29 on said shaft. Supported on the standard 10 is a hot-water box 30, having at its center a chamber 31, in which a wax-receptacle 32 is arranged to rotate. Secured to the upper end of the wax-receptacle 32 is a spider 33, which is connected to the shaft 13, and at the lower end the wax-receptacle has a tubular extension 34, which has a bearing in a tubular extension 35 on the water-box 30.

Arranged in the tubular extension 34 is a perforated bushing 36, of rubber, and through this bushing the threads are designed to pass during the twisting operation, and the bushing is also designed to regulate the amount of the wax applied to the twisted threads. The pressure of the rubber bushing on the threads may be regulated by a screw 37 engaging with the interior thread of the extension and passing through a tubular nut 38, engaging with the thread of the extension 35.

Below the water-box 30 and communicating therewith through a pipe 39 is another water-box 40, having a chamber 41, in which is arranged a wax-receptacle 42, which has a tubular extension 43 at its lower end, in which is arranged a rubber bushing 44, which is perforated to permit the passage therethrough of the twisted threads, and the degree of pressure of the rubber bushing on the threads may be regulated by a screw 45 similar to the screw 37. The bushings 36 44 not only serve the purposes above mentioned, but they also prevent leakage of the melted wax.

Hot water is supplied to the water-boxes through a pipe 46 and passes out through a pipe 47. These pipes may connect with any suitable heater, and they are designed to maintain a constant circulation of hot water.

Fixedly mounted on the shaft 13 is a sleeve 48, and on this sleeve are outwardly-extended spindles 49, on which the thread-spools 50 are mounted to rotate. To prevent too free movement of the spools on the spindles, I provide springs 51, which surround the spindles and engage with the ends of the spools, and the tension may be regulated by nuts 52. From



the spools threads 53 extend upward over levers 54, mounted to swing on arms 55, extended outward from the upper end of the sleeve 48. These arms at their outer ends are  
 5 provided with slots which form guides for the threads. It may be here stated that in winding threads on the spools the inner ends are to be secured to the spools, and when the thread is entirely unwound from a spool it is  
 10 desired that an alarm shall be given, and therefore the levers 54 are designed to serve as closers for an electric circuit by engaging with a contact-ring 56, attached to the arm 12 but insulated therefrom and also insulated from  
 15 the shaft 13, around which the ring extends. The alarm, as here shown, consists of a bell 57, having a wire connection 58 with the ring 56 and also having a wire connection 59 with the levers 54, through the sleeve 48 and the  
 20 arms 55, and in the wire 59 is arranged an electric battery 60. Obviously when the thread is entirely unwound from the spool and as its end is secured thereto there will be a downward pull on the outer end of the levers 54,  
 25 causing their inner ends to engage with the contact-ring 56 to close the circuit and sound the alarm.

The twisting of the thread is done between the rotary wax-holder 32 and the fixed wax-  
 30 holder 42, and after passing out of the wax-holder 42 the thread passes under a pulley 61, which draws the thread through the wax-pot, thence over a pulley 62, under a spring-tension pulley 63, and then over a pulley 64 to  
 35 the sewing-machine.

On the shaft 21 is a pinion 65, engaging with a gear-wheel 66, and on the same shaft with the gear-wheel 66 is fitted a grooved pulley. To wind the bobbin for the sewing-  
 40 machine, the thread is passed from the wax-pots around the grooved pulley on the shaft of the wheel 66, and the end of the thread is attached to the bobbin in the bobbin-winder. By throwing the thread-machine out of gear and turn-  
 45 ing the bobbin-winder the thread serves as a drive-belt for the thread-machine and makes the thread as it is wound on the bobbin for the sewing-machine.

In the operation the several strands or  
 50 threads are passed into the wax-holder 32 and also through the wax-holder 42 after being twisted between the two wax-holders, as before mentioned. The hot water in the boxes will keep the wax in a liquid condition, and  
 55 the individual strands or threads will be thoroughly waxed in the holder 32, and the twisted threads will be waxed on the outer side in the holder 42.

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

1. A thread twisting and waxing device comprising a liquid-wax holder, means for causing a rotary movement of the holder, a  
 65 plurality of thread-spool supports mounted to

rotate above the wax-holder, a fixed wax-holder below the rotary wax-holder, and means for heating the wax-holders.

2. A machine for twisting and waxing thread, comprising a rotary wax-holder having  
 70 a tubular extension at the bottom, a flexible perforated bushing arranged in said extension, means for adjusting the pressure of the bushing, and means for drawing threads through the wax-holder and bushing.

3. A thread twisting and waxing machine comprising a rotary wax-holder, means for heating the same, a tubular extension at the bottom of the holder, a flexible perforated  
 80 bushing in said extension, a fixed wax-holder below the first-named holder, the said fixed holder having a tubular extension at the bottom, a perforated flexible bushing in said extension, and thread-supply devices above the first-named wax-holder.

4. A thread twisting and waxing machine comprising a standard, a water-box supported on said standard and having a chamber, a wax-holder mounted to rotate in said cham-  
 90 ber, a water-box below the first-named box and communicating therewith, a wax-holder arranged in said lower box, water inlet and outlet pipes for the boxes, and thread-supporting devices above the first-named holder.

5. A thread twisting and waxing machine  
 95 comprising wax-holders through which the threads are designed to pass, a rotary shaft to which one of said holders is secured, spindles carried by said shaft for supporting thereon spools, swinging levers over which  
 100 the threads are designed to pass, the said levers forming electric contact-points, a contact-ring adapted to be engaged by said points, and an electric-alarm device having connection with said ring and said levers.

6. A thread twisting and waxing machine comprising a rotary wax-holder, a fixed wax-  
 110 holder below the rotary holder, means for heating said holders, the said holders having openings in the bottom through which the threads to be twisted and waxed may pass, a shaft supporting the rotary holder, spool-supporting spindles extending outward from said shaft, and tension-springs on the spindles.

7. A thread twisting and waxing machine  
 115 comprising a standard, heating devices supported on the standard, a wax-holder mounted to rotate in one of the heating devices, a wax-holder immovably placed in the other of said heating devices, the said holders having tu-  
 120 bular extensions at the bottom, perforated rubber bushings in said extensions, and a rotary thread-carrier arranged above the rotary wax-holder.

8. A thread twisting and waxing machine  
 125 comprising a standard, an arm extended from the upper end of said standard, a shaft having a bearing in said arm, a pinion on the upper end of said shaft, a gear-wheel supported by the standard and engaging with said pinion,  
 130



a driving mechanism for said gear-wheel, a wax-holder carried by said shaft and having an opening in its bottom through which threads may pass, a sleeve on the shaft, spindles extended from the sleeve for supporting spools of thread, arms extended outward from the sleeve and having guide-slots, levers mounted to swing on the arms and over which the threads pass, the said levers forming electric contacts, a contact-ring supported by the arm extended from the standard and insulated therefrom, and an electric bell having connection with said ring and with said sleeve.

9. A thread twister and waxer comprising two wax-holders arranged one above the other and having openings at the lower end through which threads may pass, the upper holder being mounted to rotate to cause the twisting of the threads or strands between the upper holder and the lower holder, and thread-holding devices mounted to rotate with the rotary holder.

10. In a thread twisting and waxing machine, a rotary wax-holder, a fixed wax-holder below the rotary holder the said holders having openings through the bottom, water-boxes

in which the holders are arranged, the said boxes communicating one with the other, circulating-pipes communicating with the boxes, rotary thread-holders arranged above the rotary wax-holder, and means for rotating said wax-holder and thread-holders.

11. A thread twisting and waxing machine comprising a rotary wax-holder, a fixed wax-holder, below the rotary holder, said holders having openings through the bottom, thread-supporting devices arranged above the rotary holder, and electric-alarm-circuit closers controlled by threads extended from the thread-holders.

12. A thread twister and waxer comprising mechanism for waxing a plurality of threads, twisting the threads together, and then waxing the twisted thread.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT HARRIS FORSYTHE.

Witnesses:

CLYDE R. WALLAR,  
H. B. BOYD.