

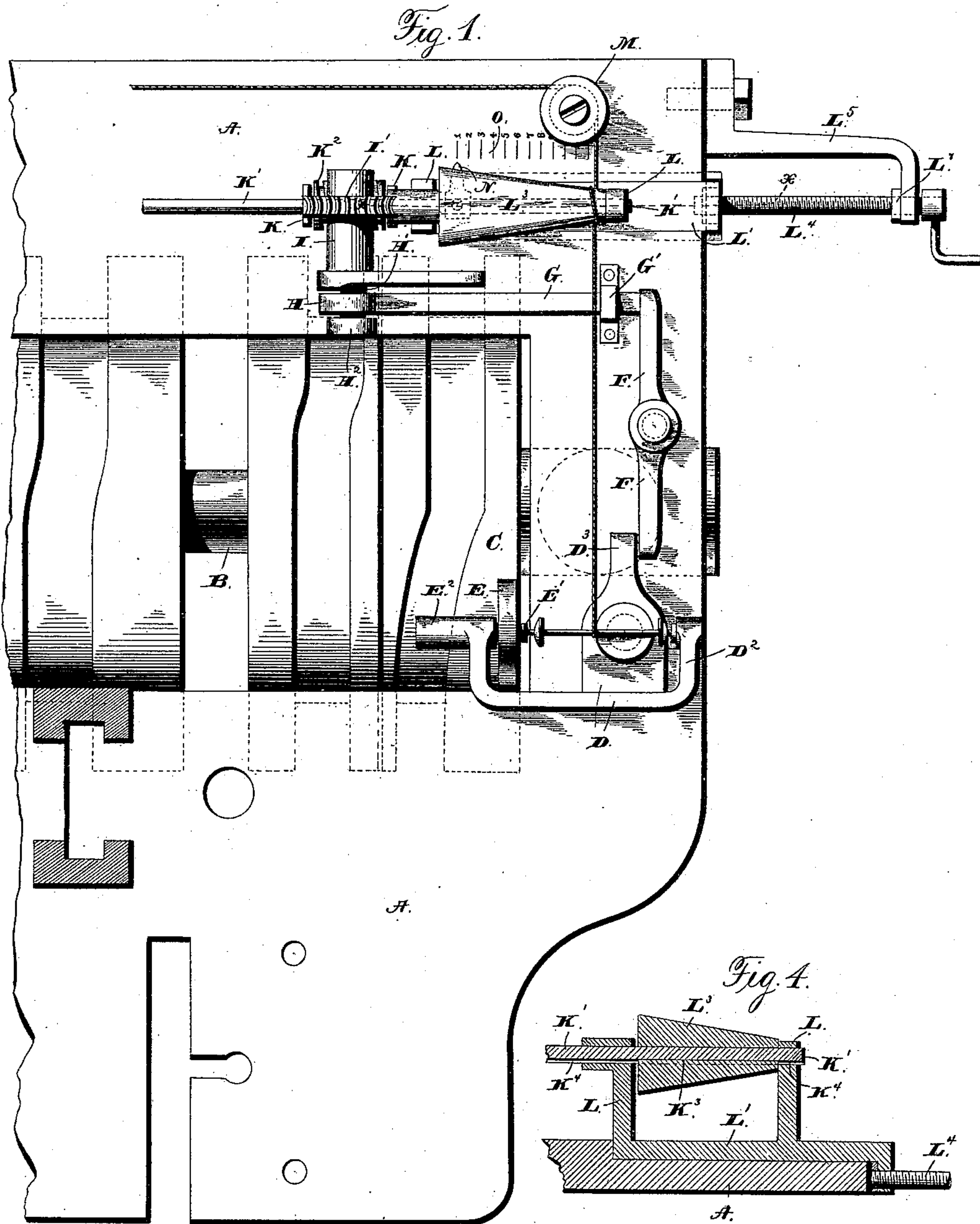
(No Model.)

2 Sheets—Sheet 1.

C. DANCEL.
MECHANISM FOR WINDING BOBBINS.

No. 420,441.

Patented Feb. 4, 1890.



Witnesses:

Jas. E. Hutchinson.

Henry C. Hazard.

Inventor:

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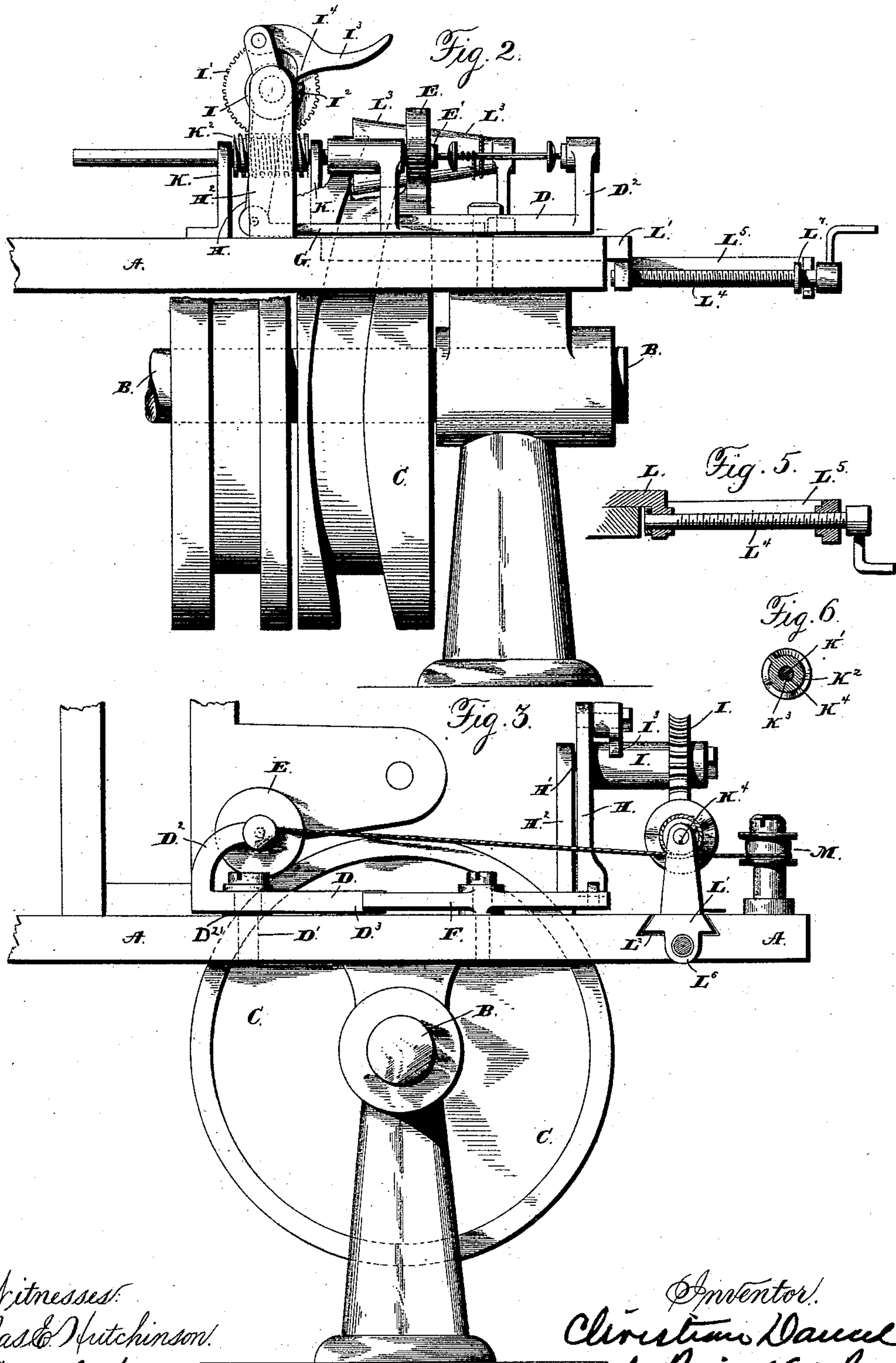
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UNITED STATES PATENT OFFICE.

CHRISTIAN DANCEL, OF NEW YORK, N. Y., ASSIGNOR TO JONATHAN MUNYAN, OF WORCESTER, MASSACHUSETTS.

MECHANISM FOR WINDING BOBBINS.

SPECIFICATION forming part of Letters Patent No. 420,441, dated February 4, 1890.

Application filed December 11, 1888. Serial No. 293,245. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN DANCEL, of New York city, in the county of New York, and in the State of New York, have invented certain new and useful Improvements in Mechanism for Winding Bobbins; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 shows a plan view of my bobbin-winding mechanism as arranged in connection with the actuating or driving devices of a sewing-machine; Fig. 2, a view of the same in front elevation; Fig. 3, a view of the same in side elevation; Fig. 4, a sectional view on line $x x$ of Fig. 1. Fig. 5 is a detail view of a modified form of adjustment for the rollers, and Fig. 6 shows a transverse section of the worm and shaft.

Letters of like name and kind refer to like parts in each of the figures.

The object of my invention is to provide certain improvements in automatic bobbin-winding mechanism adapted to wind upon the bobbin a certain predetermined amount; and to this end my invention consists in the bobbin-winding mechanism, and in the construction, arrangement, and combination of parts thereof, as hereinafter specified.

In my application Serial No. 281,556, for United States patent, now pending, I show, describe, and claim a sewing-machine for sewing boots and shoes, in which a bobbin is used having upon it a quantity of thread just sufficient for the sewing of one boot or shoe. For automatically winding upon a bobbin this required amount of thread I have invented the hereinafter described and claimed mechanism. As for different-sized boots and shoes different amounts of thread are needed to complete the sewing, my winding mechanism is made adjustable, so that it can be readily set to wind any predetermined amount before it stops or is thrown out of action. While it is intended for use in connection with my sewing-machine, as set forth in my said pending application, it can be made use of to advantage wherever or whenever it is desired to wind upon a bobbin, spool, reel, or

roller a certain length or lengths of thread, cord, yarn, or other material.

In the drawings, A designates a table or bed-plate upon which the winding mechanism is supported. As shown, it is of the shape and construction of the sewing-machine bed-plate set forth in my said pending application; but this is of course not necessary. Any suitable frame or supporting-plate can be used.

B designates a driving-shaft, upon which is the roller or wheel C. As illustrated in the drawings, this wheel is the cam-wheel which is set forth in my sewing-machine application as actuating the needle-feed devices; but, so far as the invention covered in the present case is concerned, the cam-groove performs no function, and the wheel can have a plane periphery.

Upon the swinging frame D, pivoted to plate A by means of the vertical pivot D', is the roller or wheel E, rotating upon a horizontal axis. This wheel can be supported on the frame D in any desirable way; but I prefer to provide it, as indicated in the drawings, with a short shaft E' projecting from one side of it and journaled in a bearing E² of sufficient length to secure steadiness of rotation of the wheel. This bearing is on an arm of the frame D. The wheel is so situated on the frame that by the swinging of the latter it can be brought around with its periphery in contact with that of the wheel or roller C and with its supporting-shaft E' parallel to the driving-shaft B. Rotation of the wheel or roller C will then cause the wheel E to revolve as long as the two wheels remain in contact.

The wheel E is to be provided on its side opposite to its supporting-shaft E' with a centrally-arranged device adapted to receive and hold the end of the pivot shaft or stud at one end of a bobbin, so that such bobbin will be compelled to rotate with the wheel.

The frame D is provided with an upright arm D², adapted to support the bobbin pivot stud or shaft at the other end of the bobbin, so as to leave the latter free to rotate.

I have not shown and do not describe any particular form of means for receiving and

sustaining the bobbin in the frame or of clutching the wheel and bobbin shaft or pivot-stud together, as any of the well-known means for this purpose understood by those familiar with bobbin-winding attachments or devices can be used. If desired, a washer can be placed at D^2 around pivot D' , so as to support the frame D clear of the table in its movements. This frame-pivot is situated below the end of the bobbin, away from the wheel E , so that the pull of the thread being wound on the bobbin will tend to swing the bobbin-carrying frame always in one direction. The thread or other material to be wound comes from the source of supply to the bobbin in such direction that its pull on the bobbin as the latter is rotated acts to keep the frame swung into such position that the wheel E will remain in contact with and be rotated by wheel or roller C . A horizontally-swinging lever F on the plate A has one of its arms in position to engage an arm D^3 on the frame D , so that as the lever is swung on its pivot the frame will be moved in a direction to carry the bobbin-rotating wheel E out of engagement with driving-wheel C . The other arm or end of lever F is in the track of the reciprocating bar G , supported on the table A and moving in a direction substantially at right angles to the lever and parallel to the driving-shaft B . The end of this bar, situated on the same side of the lever as the arm D^3 on frame D , will, when the bar is reciprocated, engage and move the lever so as to swing the frame and disengage the two wheels C and E . The lever-engaging end of the bar is guided by a guide lug or loop G' on the table or plate A . At its other end the bar is pivotally connected with the lever H , pivoted upon the horizontal pivot shaft or arm H' , attached to and extending out from the standard H^2 in a direction substantially at right angles to bar G . Journaled upon this pivot-shaft is the hub I of the worm gear-wheel I' . On this hub, close beside the pivotal portion of the lever H , is a radially-extending shoulder I^2 . As shown, the outer and inner ends of this shoulder are connected by a spirally-arranged surface extending around the hub, so as to make a sort of cam; but such construction is not necessary.

Pivoted to the upper end of the lever H on the same side thereof as hub I is the swinging pawl-lever I^3 , having a lug or projection I^4 , adapted to be positively engaged by the shoulder I^2 on the hub I , so as to cause the upper end of lever I to be moved as the hub is rotated to carry the shoulder upward, as shown in Fig. 2. The lever I is then swung in a direction to carry the bar G against lever F , and through the engagement of this lever with the frame-arm D^3 to swing the bobbin-carrying frame, so as to disengage the wheels C and E and check the rotation of the bobbin. To bring about this action of the shoulder I^2 on the pawl-lever I^3 at the time when a certain predetermined amount of thread or other ma-

terial has been wound upon the bobbin, the hub carrying the shoulder can be rotated by means of a roller or wheel, around which the thread or material is passed on its way to the bobbin.

Journaled in the two uprights K K , so as to be capable of longitudinal movement with reference thereto as well as rotation, is the shaft K' at right angles to the shaft-supporting hub I . Upon this shaft, between the two supporting-uprights, is the worm K^2 , engaging the gear-wheel I' . The worm and shaft are so connected together, as shown in Fig. 6, that the two must rotate together; but the shaft can be moved longitudinally through the worm. The connection I prefer to make by means of a lug or key K^3 engaging a groove K^4 in the shaft. Instead of this arrangement and construction, the shaft and the shaft-opening in the worm can be made correspondingly angular in cross-section. The outer end of the shaft is journaled in or passes through two uprights L L , attached to or carried by a slide L' , guided on the table A , so as to be capable of movement to and from the worm K^2 . For the purpose of guiding the slide I make a dovetailed groove L^2 in the table and make the slide to fit it. Fixed on the worm-carrying shaft between the two uprights is the conical roller L^3 , around which the thread or other material is passed on its way to the bobbin being wound. A screw L^4 , having its outer end swiveled or journaled in a bracket-arm L^5 and its inner end tapped through a lug L^6 on the slide L' serves to adjust the slide and the roller L^3 longitudinally to bring the part of the roller which is of the desired diameter in the track of the thread passing to the bobbin. As shown in Fig. 2, this screw is provided at its outer end with a crank by which it may be turned, and with a collar L^7 , adapted, in conjunction with the hub or attaching portion of the crank, to so engage the bracket-arm between them as to prevent longitudinal movement of the screw, while leaving it free to be rotated. Instead of this construction, one end of the screw could be swiveled to the slide, while its other end could be tapped through a nut or head on the bracket L^5 , as shown in Fig. 5. The thread or other material to be wound passes from any suitable source of supply to and around the pulley M , thence around the roller L^3 and to the bobbin, to which it is fastened in the usual way. With this arrangement, as the bobbin is rotated to wind the thread thereon, the conical roller will be turned by the passage of the thread so as to rotate the shaft K' and, through the worm-gearing shown and described, the hub I , carrying the shoulder I^2 for engaging the pawl-lever I^3 . The length of thread whose passage will be necessary to cause one complete turn of the hub I to bring the shoulder thereon into engagement with the pawl-lever I^3 , so as to swing the lever, is obviously dependent upon the diameter of

that portion of the roller L^3 around which the thread is at any time being passed. The passage of a greater or less amount of thread will be needed to turn the roller-shaft a given number of times according as the thread passes around a larger or smaller part of the roller.

By means of the screw-and-slide arrangement set forth the roller L^3 can be adjusted longitudinally, so as to bring part of any desired diameter in position for the thread to pass around it on its way from the guide-pulley M to the bobbin.

With the construction and arrangement of parts described the conical roller can easily and readily be adjusted at will, so as to bring into position for the thread to pass around it the portion of the roller of the proper diameter to allow the passage of the desired amount of thread to the bobbin before the shoulder I^2 on the hub I will engage the pawl-lever I^3 and, through the connecting mechanism described hereinbefore, swing the bobbin-holding frame to disengage the bobbin-rotating wheel from wheel C driving it. For convenience sake I contemplate providing the slide with a pointer or index-finger N, and the plate A with an index-scale O so graduated with reference to the finger, the slide, and the conical roller as to indicate the different positions of the slide necessary for securing the winding of the different predetermined lengths of thread on a bobbin.

Where the bobbin-winder mechanism is used in connection with a boot or shoe sewing machine, the scale can be numbered or its divisions marked in any desired way to indicate either the different lengths of thread or the different sizes of sole for sewing, which suitable amounts of thread will be wound as the index hand or pointer is brought opposite the marks on the scale.

Where the bobbin-winding mechanism is used in connection with other machines or to wind certain predetermined amounts of any material on a bobbin reel or roller, the scale can, of course, be changed to suit the different circumstances, its divisions being relatively arranged and marked as desired.

The operation of my bobbin-winding mechanism, which will be readily understood, is briefly as follows: With the conical roller adjusted so as to bring the part of the roller of the desired diameter in position in the track of the thread from the pulley M to the bobbin the thread is passed around the roller and its end is fastened to the bobbin. The pawl-lever is then tripped to disengage it from the shoulder or lug on the worm-wheel hub I, and the bobbin-bearing frame is swung to bring its wheel E in contact with the periphery of wheel C on the machine-driving shaft B. The rotation of this latter wheel then rotates the wheel E and the bobbin, so as to wind the thread on the latter. As the winding proceeds the thread passing around the roller L^3 rotates it, the shaft, the worm K' ,

the worm-wheel I' , and the hub I until the shoulder I^2 on the latter comes up against the lug or shoulder on the pawl-lever I^3 . The movement of the pawl-lever by the shoulder on the hub then swings lever G, so as to reciprocate bar F, and through lever D^3 swings the bobbin-carrying frame to disengage wheel E from its driving-wheel C. The desired amount of thread having been wound upon the bobbin and winding being stopped, the thread can be cut between the roller and the bobbin, and the latter can be removed from the winding-frame and another put in its place.

With my bobbin-winding mechanism, as described, a bobbin can be wound with the requisite amount of thread while the machine is being used to sew a sole, so that when the bobbin in the shuttle is used up the newly-wound one is ready to be taken at once and inserted in the place of the spent one, ready for the sewing of another sole.

In order to insure that the exact amount of thread desired shall be wound upon the bobbin, I prefer to actuate the shifting and stopping devices for the bobbin-holder by means of the thread as it passes to the bobbin rather than by the thread after it is wound on the bobbin.

Where the accumulation of thread upon the bobbin is relied upon to operate the bobbin-holder shifting or stopping mechanism in order to get any regularity in the amount of thread wound upon the bobbin during any one winding operation, it is necessary that the winding shall be done always evenly along the bobbin and that the thread shall be of uniform thickness. Any irregularity in the winding of the thread on the bobbin or in the thickness of the thread obviously must cause irregularity in the winding operation. With my mechanism there can be no such irregularity, for the stopping of the bobbin-holder is caused only by the passage of a certain predetermined length of thread to the bobbin. The action of the holder-stopping device is then independent of any irregularity in the winding of the thread upon the bobbin or change in its thickness.

Having thus described my invention, what I claim is—

1. In combination with a bobbin-holder and means for rotating the same, a movable piece moved by the thread on its way to the bobbin in the holder and a shifting device for throwing the holder-driving mechanism out of action, connected with and operated by the movable piece, substantially as and for the purpose specified.

2. In combination with a rotary bobbin-holder and the driving mechanism therefor, a roller in contact with the thread on its way to a bobbin in the holder and a shifting device for throwing the holder-driving mechanism out of action, connected with and operated by the roller, substantially as and for the purpose shown.

3. In combination with a bobbin-winding mechanism and a roller driven by the thread as it passes to the bobbin, means for throwing the winding mechanism out of operation, 5 connected with the roller, so as to be actuated thereby, substantially as and for the purpose set forth.

4. In combination with a moving driving part, a bobbin-holder provided with a wheel 10 to engage and be driven by the moving driving part and an automatic shifter for shifting the wheel out of engagement with the driving part and a movable part connected with the shifter, so as to operate it, actuated 15 by the thread passing to a rotating bobbin in the holder, substantially as and for the purpose described.

5. In a bobbin-winding mechanism, in combination with a movable frame, the bobbin- 20 holder thereon provided with a wheel, a rotary wheel to engage the holder-wheel when the frame is moved in one direction, a roller around which the thread passes on its way to the bobbin, and connections between the 25 roller-shaft and the bobbin-holder frame for moving the latter to disengage the holder-wheel from the driving-wheel when the roller has made a certain number of revolutions, substantially as and for the purpose shown.

30 6. In combination with the swinging frame, the bobbin-holder thereon provided with a wheel, and a wheel for driving the holder-wheel, the lever engaging an arm on the frame, the reciprocating bar, the pivoted lever 35 connected with the bar, the pawl on such lever, the rotary hub having the shoulder to engage the pawl, the roller around which the thread passes on its way to the bobbin, and connecting-gearing between the 40 roller-shaft and the shoulder-carrying hub, substantially as and for the purpose set forth.

7. In combination with a rotary driving-wheel, a swinging frame carrying the bobbin- 45 holder provided with a wheel adapted to be brought into and out of engagement with the

driving-wheel by the swinging of the frame, a guide-roller around which the thread passes to the bobbin, a conical longitudinally-adjustable roller around which the thread 50 passes on its way to the bobbin, and connecting mechanism between this roller and the swinging bobbin-holder frame whereby a certain number of revolutions of the roller causes the frame to be moved to disengage 55 the holder-wheel from the driving-wheel, substantially as and for the purpose described.

8. In a bobbin-winding mechanism, in combination with the rotary bobbin-holder and the swinging frame carrying the same, the longitudinally-adjustable conical roller 60 around which the thread passes on its way to the bobbin, the worm on the roller-shaft, the worm-wheel, the shoulder or lug carried around by the rotation of the wheel, the lever, the pawl thereon, the bar connected with 65 such lever, and the pivoted lever engaged by the bar and engaging an arm on the bobbin-holder frame, substantially as and for the purpose specified.

9. In a bobbin-winding mechanism, the 70 means for insuring a movement of the bobbin-stopping devices when a given amount of thread has been wound, consisting of the conical roller in the track of the thread of the bobbin, means for adjusting the roller 75 longitudinally, a worm on the shaft of the roller, a worm-wheel meshing therewith, a shoulder or lug on the hub of the wheel, a lever, and a pawl on such lever adapted to be engaged by the shoulder on the wheel-hub, so 80 as to swing the lever, substantially as and for the purpose shown.

In testimony that I claim the foregoing I have hereunto set my hand this 6th day of December, 1888.

CHRISTIAN DANCEL.

Witnesses:

CHAS. M. MILLER,
W. H. BALL.