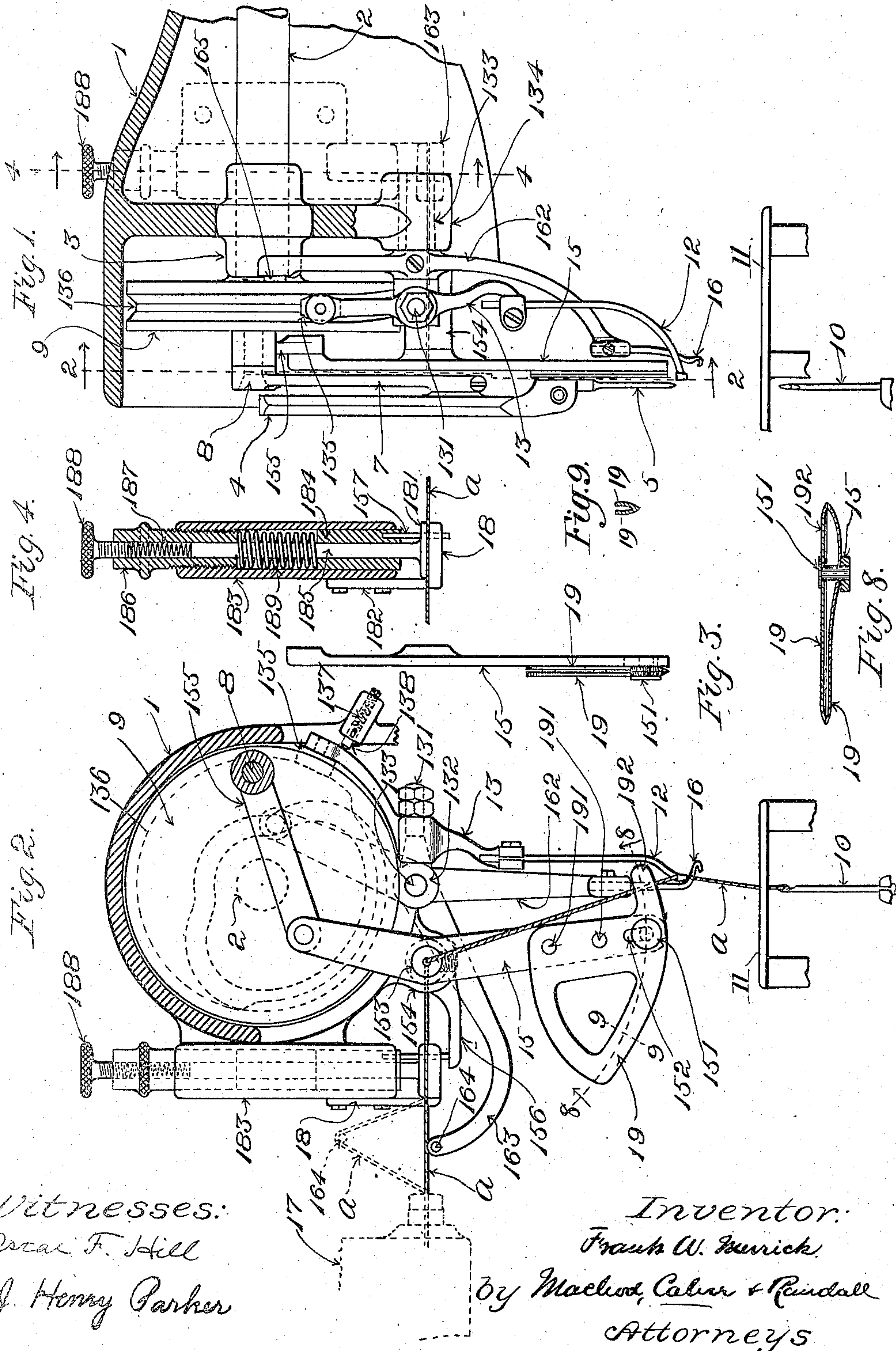


F. W. MERRICK.
 NEEDLE THREAD TAKE-UP AND CONTROLLING DEVICE FOR SEWING MACHINES.
 APPLICATION FILED MAR. 11, 1904.

930,980.

Patented Aug. 10, 1909.

2 SHEETS—SHEET 1.



Witnesses:
 Oscar F. Hill
 J. Henry Parker

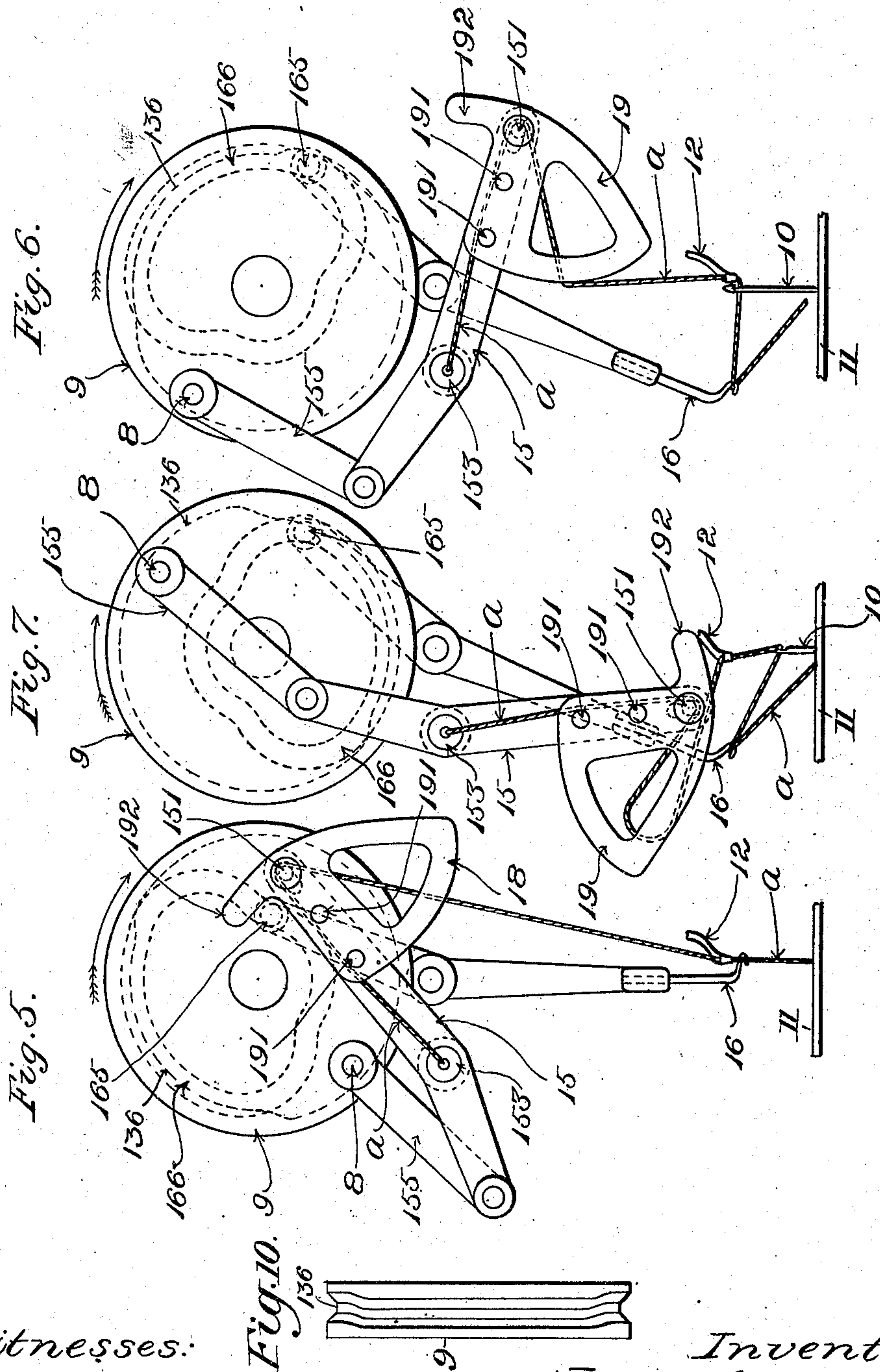
Inventor:
 Frank W. Merrick
 by MacLeod, Calver & Randall
 Attorneys

F. W. MERRICK.
 NEEDLE THREAD TAKE-UP AND CONTROLLING DEVICE FOR SEWING MACHINES.
 APPLICATION FILED MAR. 11, 1904.

930,980.

Patented Aug. 10, 1909.

2 SHEETS—SHEET 2.



Witnesses:
 Oscar F. Hill
 J. Henry Parker

Inventor:
 Frank W. Merrick
 by Machod, Calver & Randall
 Attorneys.

UNITED STATES PATENT OFFICE.

FRANK W. MERRICK, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO UNION LOCK STITCH COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

NEEDLE-THREAD TAKE-UP AND CONTROLLING DEVICE FOR SEWING-MACHINES.

No. 930,980.

Specification of Letters Patent.

Patented Aug. 10, 1909.

Application filed March 11, 1904. Serial No. 197,653.

To all whom it may concern:

Be it known that I, FRANK W. MERRICK, a citizen of the United States, residing at Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Needle-Thread Take-Up and Controlling Devices for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention in its entirety, as described herein, has been designed, more particularly, for application to wax-thread sewing-machines employing what are known as hooked needles. Certain of the principles and features of the invention, however, are not necessarily restricted to use in this precise connection, and may be employed in sewing machines of different class and character without necessarily involving departure from the spirit of the invention.

I will proceed to explain the invention with reference to the application of the same to a wax-thread sewing machine employing a hooked needle as illustrated in the accompanying drawings, in which latter,—

Figure 1 shows in front elevation, with the overhanging arm or gooseneck partly in vertical longitudinal section, portion of the said sewing machine with an embodiment of the invention applied thereto. Fig. 2 is a view looking from the left-hand side in Fig. 1, showing the mechanism in vertical section on line 2, 2, of Fig. 1. Fig. 3 is an edge view of the take-up lever, detached, showing the slack-thread controller applied thereto. Fig. 4 shows the thread-gripping and tension devices, detached, in vertical section on line 4, 4, of Fig. 1. Figs 5, 6 and 7, Sheet 2, are views illustrating the working of the take-up, slack-thread controller, and thread-finger. Fig. 8 is a detail view in section along the line 8—8 of Fig. 2, looking in the direction indicated by the arrows at the ends of such line. Fig. 9 is a detail view in cross-section on line 9—9 of Fig. 2. Fig. 10 is an edge view of the crank-disk 9, showing the transverse bends in the course of the cam-groove which is formed in the said disk.

Having reference to the drawings,—at 1, Figs. 1 and 2, is shown the outer portion or head-end of the overhanging arm or gooseneck of a sewing machine, a portion of the

usual rotating operating or driving shaft which extends within the said arm or gooseneck being represented at 2, and a bearing for the said shaft being shown at 3, Fig. 1, in the said head-end.

At 4, Fig. 1, is shown the awl-bar, it carrying the awl 5. In practice, the awl-bar is mounted to reciprocate vertically in guides (not necessary to be shown) which are located at the outer end of the said arm or gooseneck. The said guides may be provided in a laterally-movable head, as frequently the case in practice. The said laterally-movable head, and the means of operating the same as required in order to effect the feed of the material being sewed, may be as usual or of any preferred character and construction. The construction and arrangement shown and described in the application of Henry H. Cummings for United States patent for Sewing Machine, filed September 23, 1903, Serial No. 174,260, may be employed if desired.

For the purpose of reciprocating the awl-bar vertically, it is connected by means of a link 7 with a crank pin 8 which rotates in unison with the shaft 2. The crank-pin preferably is mounted upon a disk 9 which is fast upon the shaft 2. A hooked needle of the general character of those employed in hook-needle wax-thread sewing machines is shown at 10. The actuating connections therefor, which may be of any approved character, are not necessary to be shown, and accordingly have been omitted from the drawings. Portion of a work-support is indicated at 11. The needle 10 is shown arranged to work upward from below through the material which is to be stitched, while the awl-bar and awl, and devices for applying the thread to the needle, are arranged at the upper side of the said material. The looper by means of which the thread is laid within the open eye of the needle is shown at 12, it being carried by one arm of a lever 13. The means and manner of operating the lever 13 may vary in practice, although herein the said lever 13 is mounted pivotally upon a substantially horizontal forwardly-projecting stud 131, with capacity to turn transversely upon the said stud so as to permit the looper to be swung transversely with relation to the line of feed adjacent to the needle 10, and for the purpose of enabling the looper to have movement in

the direction of the line of the feed, in addition, the said stud 131 is permitted to swing about a fixed center in a vertical plane which is parallel with the line of feed. To this latter end, the stud 131 is provided with a collar 132 which is sleeved upon the projecting end of a short horizontal rockshaft 133, with capacity to turn around the same, the said rockshaft occupying a position parallel with the shaft 2 and being fitted to a bearing which is provided therefor at 134 in the arm or gooseneck 1.

The looper 12 is caused to follow the required path around the upper end of the needle 10, for the purpose of applying the thread to the open eye of the needle preliminary to each descent of the needle for the formation of a stitch, by causing the lever 13 to swing transversely with reference to the line of feed around the stud 131, and by causing the lever and said stud to swing in unison around the rockshaft 133 in a vertical plane which is parallel with the direction of the line of feed. For the purpose of occasioning these movements, the upper arm of the lever 13 is furnished with a cam-follower 135, and the periphery of the disk 9 on the shaft 2 is formed with a cam-groove 136 within which the said cam-follower 135 fits. In order to compensate for wear, the sides of the groove 136 are made inclined toward each other, as shown, so that the groove is essentially V-shaped, and the cam-follower 135 is tapered correspondingly to fit such groove. The cam-groove 136 is varied in its direction, both radially with relation to the axis of the shaft 2, and transversely or parallel with the said axis. Thereby, in consequence of the engagement of the cam-follower 135 within the said cam-groove the compound movements of the lever 13 and looper 12 by which the delivery end of the looper is caused to travel in the required path around the hooked end of the needle are occasioned. In practice, the cam-follower 135 is held pressed radially inward into the cam-groove 136 through the aid of a spring 137, Fig. 2, which acts in connection with a plunger 138 engaging with lever 13, and tends to move the said lever 13 inwardly in opposition to the radial outward throw of the cam-groove.

The take-up arm or lever, shown at 15, is furnished at its working end with a stud or roll 151 for engagement with the thread. For the purpose of enabling the amount of thread which is drawn up by the take-up arm or lever 15 in its taking-up movement to be varied, as may be required, the said arm or lever is radially slotted, as at 152, Fig. 2, to permit the said stud or roll to be set farther from or nearer to the axis of movement of the take-up arm or lever, according as a greater or less amount of thread is required to be drawn out by the take-up

arm or lever in its movement. The take-up arm or lever is supported upon a horizontal rockshaft 153, which latter is mounted in a suitable bearing which is provided therefor at 154, Figs. 1 and 2, in the head of the machine. I connect the take-up arm or lever by means of a pitman or link 155 with the crank pin 8. One extremity of the said pitman or link is pivoted to the crank-pin, and the other extremity thereof is pivoted to the said take-up arm or lever at a fixed distance from the pivotal axis of the latter. The employment of a crank and pitman or connecting link for the actuation of the take-up arm or lever, instead of a cam as usual in many sewing machines heretofore, obviates the weight and the wear and tear in connection with the cam. Thereby the machine is rendered easier-running, the vibration and noise in running are greatly reduced, and a more durable construction is secured. The employment of the crank, and the pitman or connecting link having one extremity thereof pivoted to the crank-pin and the other extremity thereof pivoted to the take-up arm or lever at a fixed distance from the pivotal axis of the latter, in lieu of a rotating or other pin working in a cam-shaped slot, or other slot, in an arm connected with the take-up arm or lever, affords a direct and simple construction, free from the liability of the latter construction to wear and occasion loss of adjustment, play, vibration and noise. By combining the take-up arm or lever by a pitman or connecting link with the same crank-pin which is operatively connected with the awl-bar and awl, I am enabled to reduce the number of working parts in the head of the machine, thus simplifying the construction, and securing considerably greater compactness than in many prior machines of the same general class.

I have found that by properly locating the pivotal axis of the take-up arm or lever, substantially as shown in the drawings, it is possible to cause the awl-bar and awl and also the take-up arm or lever to act in the required sequence, and each with the proper relative timing in the sequence of the operations which are performed by the various working elements of the machine, through connections with a single crank-pin as described.

As shown in Fig. 2, the link 155 is fitted to the pin of the crank 8 between the link 7 and the disk 9. The effective length of the link 15, that is to say, the distance in a straight line between the point of its connection with the crank 8 and the point of its connection with the take-up arm or lever 15, is nearly the same as the radial length of the crank, and hence in the position of the crank which corresponds with the retracted position of the take-up arm or lever the point of

connection between the said link and the take-up arm or lever is near the axis of the shaft 2. The effective length of the link is slightly greater than the radial length of the crank, in order that the point of connection between the link and the take-up arm or lever may not be carried into line with the axis of shaft 2, in which position there would be a tendency of the take-up arm or lever to become locked so that the proper working of the same would not be secured, and injury to the parts would result. The proportions and arrangement illustrated produce a quick movement of the take-up arm or lever from the position thereof in Fig. 2 to the position thereof in Fig. 5, to take up the thread in tightening the stitch which is in process of completion, a somewhat slower return from the position of the take-up arm or lever in Fig. 5 through that in Fig. 6, to that in Fig. 7, and a period of considerable duration during which the take-up arm or lever occupies its retracted position, substantially as in Fig. 7, and the thread is left free to be solicited by the thread-finger, looper, and needle in their movements. With the parts constructed, etc., as in the drawings, the taking-up is begun and completed within practically one quarter, or 90 degrees, of a revolution of the shaft 2. During the next 135 degrees of such revolution the take-up arm or lever is returning to its normal or starting position, while during the remaining 135 degrees of the rotation of the crank-pin the thread is left free from restraint by the take-up and roll. At the time of the taking-up, the crank-pin is passing in its travel between the shaft 2 and the point of connection between the link 155 and the take-up arm or lever 15, as indicated in Fig. 5, so that the devices act upon the principle that is involved in a toggle to give the greatest power at the time of the greatest strain, the final strain coming on slowly and safely as the crank approaches the center.

The rockshaft 153 on which the take-up arm or lever 15 is mounted is tubular, the central bore of the said rockshaft serving as a guide-passage for the thread, the latter passing through the said bore on its way from the source of supply to the needle. From the forward end of the rockshaft the thread extends to the eye of the looper 12, and thence to the material which is in process of being stitched. The advantage of causing the thread to extend from a guide which is located at the axis of movement of the take-up arm or lever, directly past the stud or roll 151, of the said take-up arm or lever, as in Fig. 2, is that the length of thread between such guide and the said stud or roll remains the same in all positions of the take-up arm or lever. Consequently in the taking-up movement of the take-up arm or lever, at the time of greatest strain, the

thread does not render or travel over or around the stud or roll. Thus fraying the thread is obviated.

The thread, in advancing from the source of supply, passes from the usual wax-pot or equivalent device to the entrance of the central bore of the rockshaft 153 at the rear end of the said rockshaft. A portion of a wax-pot is shown in dotted lines at 17 in Fig. 2. Between the wax-pot and the rear end of the rockshaft 153 is located a combined tension-device and clamp for the thread. This is shown in position in Figs. 1 and 2, detached, and in vertical section, in Fig. 4.

The device is provided with a thread-supporting and backing member 18, and a relatively-movable clamping-member 181. The supporting and backing member 18 is furnished with an arm 182, Figs. 2 and 4, which is fastened by screws to the exterior of the stand 183, which latter is attached to the outer surface of the overhanging arm or gooseneck 1. A cylindrical chamber extends vertically through the said stand 183. Within the lower end of the said chamber is fitted a sleeve 184, which is capable of movement vertically within the said chamber. The interior surface of the upper portion of the stand is screw-threaded, and within this portion of the chamber is fitted a tubular nut or externally screw-threaded sleeve 186. The clamping member 181 is furnished with a central spindle, 185, which projects upward through the central opening or bore of the lower sleeve 184, its upper end entering the lower portion of the central opening or bore of the nut or screw-threaded sleeve 186. An expanding spiral spring 187 is contained within the said central opening or bore of the nut or screw-threaded sleeve, and exerts a downward pressure upon the upper end of spindle 185, thereby carrying the clamping-member 181 toward the thread-supporting and backing member 18. Thereby the thread passing between the opposing working surfaces of the members 18, 181, is subjected to compression, by which its passage between such surfaces is retarded, and thus the required tension of the thread-supply is secured. For the purpose of enabling the tension to be regulated, the upper portion of the bore or central opening of the nut or threaded sleeve 186 is interiorly screw-threaded, and within the same is fitted the threaded stem of an adjusting thumb-screw 188. The spring 187 is compressed between the lower end of the said thumb-screw and the upper end of the spindle 185, and by turning the thumb-screw the degree of compression is varied, whereby the action of the spring in forcing the clamping-member 181 toward the supporting and backing-member 18 is regulated.

For the purpose of enabling the thread to be clamped and held at the proper side of

the take-up device while the latter is acting to complete and tighten the last-formed stitch, an expanding spiral spring 189, Fig. 4, is placed within the chamber of the stand 183. This spring is compressed between the lower end of the nut or screw-threaded sleeve 186 and the upper end of the vertically-movable sleeve 184, and when permitted to act depresses the latter until its lower end engages with clamping-member 181, increasing the force with which the latter is pressed toward the supporting and backing-member 18 so as to hold the thread more tightly between the two members. The tension of spring 189, and consequently the degree of force with which the thread is clamped, is varied by turning the nut or screw-threaded sleeve 186 within the chamber of the stand 183. The sleeve 184 is permitted to engage with the clamping-member 181, for the purpose of transmitting the force of spring 189 thereto, during the taking-up stroke of the take-up arm or lever, in order that as the take-up arm or lever draws upon the thread in completing and tightening the last-formed stitch the thread may be securely clamped at the supply side of the take-up device, and thereby held from being drawn forward from the source of supply. While the take-up arm or lever is in its retracted position, with the thread released thereby to the action of the stitch-forming devices, the sleeve 184 is disengaged from the clamping-member 181, so as to relieve the latter of the stress of the spring 189, leaving it subject to the action of only the lighter spring 187.

For the purpose of controlling the engagement of sleeve 184 with the clamping-member, and of disengaging the said sleeve from the said clamping-member at the required times I employ a vibrating arm 156, which is timed properly in its movements, and which by engagement with a pin 157 made fast to the sleeve 184 and projecting freely through holes in clamping-member 181 and backing or supporting-member 81 operates to move the sleeve 184 away from the clamping-member 181. This arm is in operative connection with the shaft 2 through suitable devices. Preferably, the actuation of the arm 156 with proper timing is provided for by combining the same with the take-up arm or lever. This is effected by attaching the same to the rockshaft 153. By this means a separate train of actuating connections is dispensed with. During the operative stroke of the take-up arm or lever, the arm 156 releases the sleeve 184 to the action of the clamping spring 189, and the latter forces the said sleeve against the back of clamping-member 181, so as to cause the thread to be held tightly between the latter and the backing or supporting-member 18. As the take-up arm or lever nears its re-

tracted position, the arm 156 engages with pin 157 and acts to move sleeve 184 away from the clamping-member 181.

The pull-off device, by means of which while the thread is held clamped by the members 18, 181, a slight additional length of thread is pulled forward from the source of supply and through the wax-pot for use in the formation of the next succeeding stitch, comprises in the present instance an arm 163, Fig. 2, provided with a pin 164 for engagement with the thread. By such engagement, when the arm and pin are moved in the proper direction, the said pin extends the thread from its straight condition, shown by the full lines in Fig. 2, into a bend of open loop, as shown by the dotted lines in such figure. This arm 163 is in operative connection with the shaft 2. Preferably, in order to avoid the use of a separate train of motion-transmitting connections, the arm 163 is operated with proper timing by being combined with the thread-finger so as to move in unison with the latter. To this end, the arm 163 and the lever 162 to which the thread-finger 16 is attached are both made fast upon the rockshaft 133 to which reference has already been made in describing the means of operating the looper 12. One arm of the lever 162 is furnished with a pin or roll 165 working in a cam-groove 166 which is formed in the inner side of the disk 9. The contour of the said cam-groove is represented in Figs. 2, 5, 6 and 7.

The slack-thread controller consists of a thread-retainer with which the thread is caused to become engaged by the movement of the take-up arm or lever in taking-up. Preferably, the said slack-thread controller is carried by the take-up arm or lever, although this is not material in all cases. Preferably, also, the slack-thread controller comprises, essentially, a yielding clamp to receive the thread and hold the slack which is surrendered by the take-up device in its return movement securely enough to prevent kinking and snarling of the same, and surrender the same to the pull of the stitch-forming devices in the operation of producing a new stitch. In the illustrated embodiment of the invention, the slack-thread controller is constituted of two surfaces or the equivalent thereof with which the take-up arm or lever is provided. The two surfaces, in the present instance, are constituted by the proximate surfaces of two plates which are shown at 19, 19. They are attached to the portion of the take-up arm or lever which carries the stud or roll 151, parallel with each other. Their lower and rear edges converge quite closely to each other as shown by Figs. 3, 8 and 9, but except at the said edges the plates are slightly separated as shown by Figs. 8 and 9. They are secured in convenient manner to the take-up

arm or lever, as by means of rivets 191, 191, and project rearwardly from the said take-up arm or lever. The said plates 19, 19, are prolonged or extended at the front of the take-up stud or roll 151, as at 192. The prolongations or extensions are separated somewhat from each other except at their free extremities, where they come close together. The needle-thread on its way from the passage of rock-shaft 153 to the passage of looper 12 is conducted between the said prolongations or extensions. When the take-up arm or lever occupies the retracted position of Fig. 2 the needle-thread occupies the space between the said prolongations or extensions.

As the take-up arm or lever is swung from the position in which it is represented in Fig. 2, toward the position in which it is represented in Fig. 5, the portion of thread which extends from the stud or roll 151 of the take-up arm or lever to the seam passes in between the gradually converging lower edges of the plates. In the position which the take-up arm or lever occupies in Fig. 5 the thread will occupy the position between the plates which is indicated by Fig. 5. During the returning movement of the take-up arm or lever the slack portion of the thread will be lightly confined between the said plates, until it is drawn out by the action of the stitch-forming devices in forming a succeeding stitch. See Fig. 7. The returning movement of the take-up arm or lever, namely from the position of Fig. 5, through the positions shown in Figs. 6 and 7 to the position shown in Fig. 2, is timed with reference to the movements of the thread-finger 16 and needle 10 so that as the take-up arm or lever and thread-finger move from the positions which are occupied by them in Fig. 5 to the positions that are shown in Fig. 6 the slack-thread controller delivers up the proper amount of thread for the loop or bight which is being extended by the action of the thread-finger. During the continued movement of the take-up arm or lever from the position of Fig. 6 through that of Fig. 7 toward that on Fig. 2, the slack-thread controller maintains a tension on the needle-thread which insures the engagement of said thread with the hook of the needle and its retention within the open eye of the needle during the descent of the latter.

I claim as my invention:—

1. In a sewing-machine, in combination, the take-up arm or lever, a normally inactive slack-thread controller operatively connected therewith and caused to take control of the thread by the action of the said arm or lever in taking up, the rotating crank, and the pitman having one extremity thereof pivoted to the crank-pin and the other extremity thereof pivoted to the said take-up arm or lever at a fixed distance from the pivotal axis of the latter.

2. In a sewing-machine, in combination, the awl-bar and awl, the take-up arm or lever, a normally inactive slack-thread controller operatively connected therewith and caused to take control of the thread by the action of the said arm or lever in taking up, the rotating crank having its crank-pin in operative connection with the said awl-bar, and the pitman having one extremity thereof pivoted to the take-up arm or lever at a fixed distance from the pivotal axis of the latter and the other extremity thereof pivoted to the said crank-pin.

3. In a sewing-machine, in combination, the awl-bar and awl, the take-up arm or lever, a normally inactive slack-thread controller operatively connected therewith and which is caused to take control of the thread by the action of the said arm or lever in taking up, the rotating crank, the connecting link joining the awl-bar to the crank-pin, and the second connecting link pivotally joined at one extremity thereof to the take-up arm or lever and at the other extremity thereof to the same crank-pin as the link first mentioned.

4. In a sewing machine, in combination, the swinging take-up arm or lever, means to vibrate the same, and the slack-thread controller moving in unison with the said take-up arm or lever passive with reference to the thread during the take-up action and with which the thread is caused to become engaged by the movement of the said arm or lever in taking-up.

5. In a sewing machine, in combination, the swinging take-up arm or lever having a take-up stud or roll to engage the thread on its way to the seam, means to vibrate the said arm or lever, and the slack-thread controller carried by the said arm or lever passive with reference to the thread during the taking-up action and caused by the action of the take-up arm or lever to engage with the thread between the said stud or roll and the seam.

6. In a sewing machine, in combination, the take-up arm or lever having a stud or roll to engage the thread on its way to the seam, means to actuate the said arm or lever, and a slack-thread controller moving with the said arm or lever and engaging with the thread between the said stud or roll and the seam and having adjacent surfaces to confine the slack portion of thread between them.

7. In a sewing machine, in combination, a take-up arm or lever, a slack-thread controller passive with reference to the thread during the taking-up operation and operating to care for the slack of the thread during the return movement of the said arm or lever, and a rotating crank by which both the said take-up arm or lever and the said slack-thread controller are actuated.

8. In a sewing machine, in combination, a

take-up device, a looper, a thread-finger, a slack-thread controller, operating to deliver up the amount of thread required in the production of the loop that is extended by the
5 action of the thread-finger and operating means for the moving parts.

9. In a sewing machine, in combination, a hooked needle, a take-up, a looper, a thread-finger, a slack-thread controller acting to
10 take-up the slack as the thread is relieved from the strain of the take-up, delivering up the amount of thread that is required in the production of the loop that is extended by the action of the thread-finger, and main-
15 taining a tension on the thread to insure engagement of the thread by the needle and retention thereof in the open eye of the needle during the descent of the latter, and actuating means for the moving parts.

10. In a sewing machine, in combination, a take-up device, a thread-grip engaging with the thread coming from the source of supply, a thread-finger, means to operate the said take-up device, thread-grip and thread-
25 finger, and a pull-off operatively connected with the said thread-finger.

11. In a sewing machine, in combination, a take-up device, a slack-thread controller, a thread-grip engaging with the thread coming from the source of supply, grip-releasing means, the awl-bar and awl, and a rotating crank whereby the said take-up device, slack-
30 thread controller, grip-releasing means and awl-bar are all actuated.

12. In a sewing machine, in combination, the take-up arm or lever, its rock-shaft, a rotating crank in operative connection with said take-up arm or lever, an arm on said rock-shaft, and a thread-grip engaging with
40 the thread between the take-up device and the source of supply and comprising the backing-member, the clamping-member having the spindle, the sleeve 184 applied to the said spindle and adapted to be operated by
45 the last-mentioned arm, the spring acting upon the said sleeve, the adjusting sleeve for said spring, the casing within which said sleeves and spring are contained, and the spring and adjusting-screw co-acting with

the said spindle and fitted within the said
50 adjusting sleeve.

13. In a hooked-needle sewing-machine, in combination, a hooked needle, a thread-guide for laying the thread in the open eye of the
55 needle, a thread-finger engaging with the thread to provide slack to obviate rendering off the thread through the said eye, a pull-off, and a single actuating train for the said thread-finger and pull-off.

14. In combination, a take-up, a thread-
60 grip, a slack-thread controller, an awl-bar, a rotating shaft, and a common actuator for the said take-up, thread-grip, thread controller, and awl-bar, carried by the said shaft.

15. In combination, a take-up, a thread-
65 grip, a slack-thread controller, an awl-bar, and a single rotating crank by which all of the said parts are actuated.

16. In combination, a take-up, a thread-
70 grip, a slack-thread controller, an awl-bar, a rotating shaft, a common actuator for the said take-up, thread-grip, thread controller and awl-bar carried by the said shaft, a thread-measurer, a pull-off, and a common
75 actuator for the said thread-measurer and pull-off also carried by the said shaft.

17. In combination, a take-up device, an intermittent thread-grip made effective by the movement of the said device in taking-
80 up to grip the thread during the taking-up action, and a slack-thread controller with which the thread is caused to become engaged by the taking-up action.

18. In a hooked-needle sewing machine, in
85 combination, a hooked needle, a thread-guide, a thread-finger, a pull-off, a single rockshaft carrying the said thread-finger and pull-off, and means for actuating the said rockshaft to operate the thread-finger
90 and pull-off.

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

FRANK W. MERRICK.

Witnesses:

CHAS. F. RANDALL,
WILLIAM A. COPELAND.