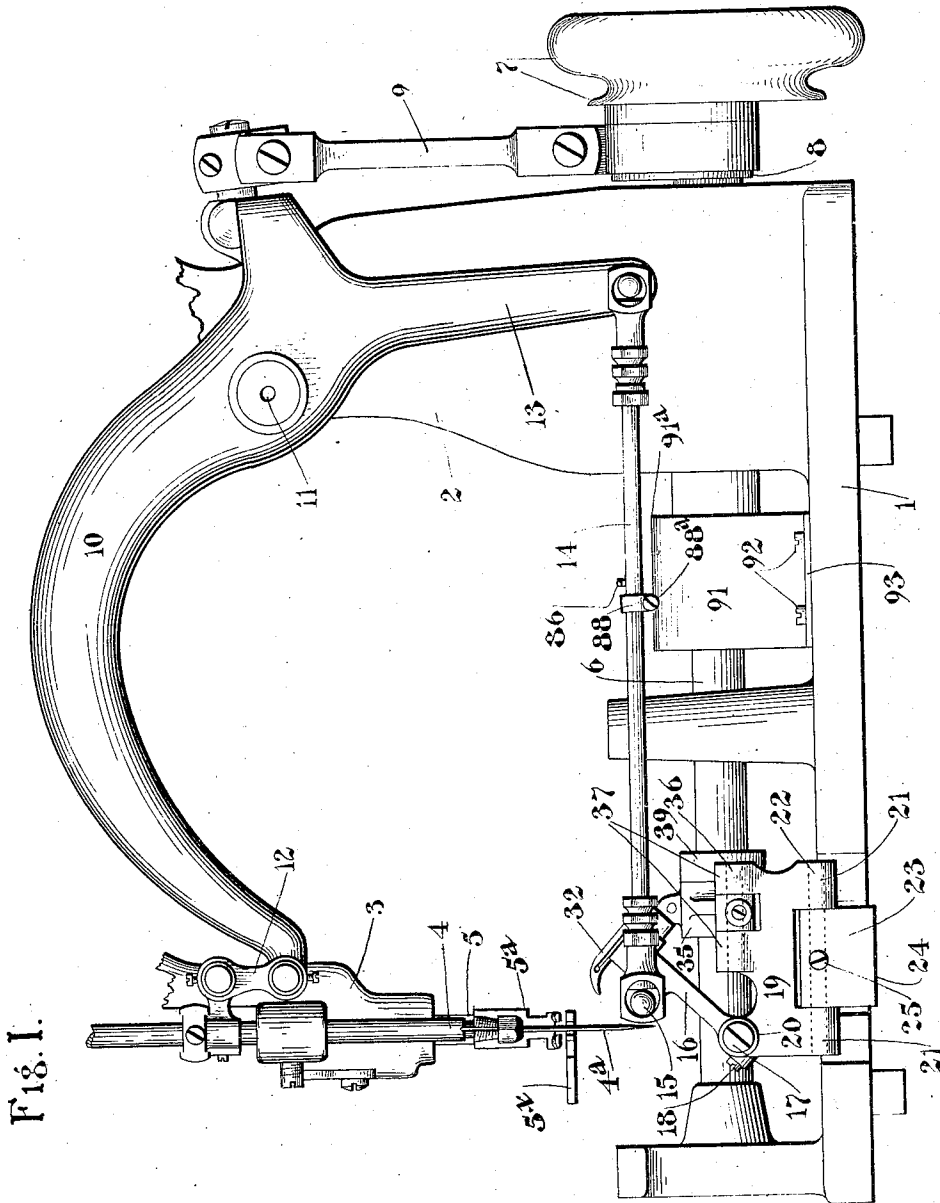


W. V. MILLER.
STITCH FORMING MECHANISM.
APPLICATION FILED DEC. 26, 1903.

974,170.

Patented Nov. 1, 1910.

5 SHEETS—SHEET 1.



WITNESSES:
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M. Kerskovitz

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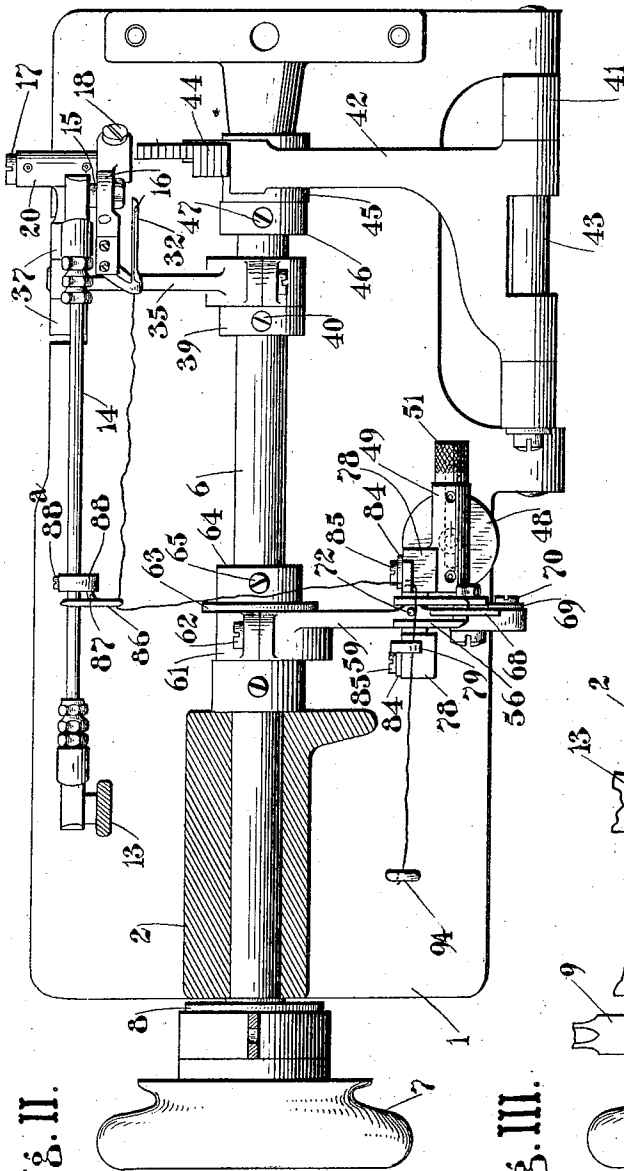


Fig. II.

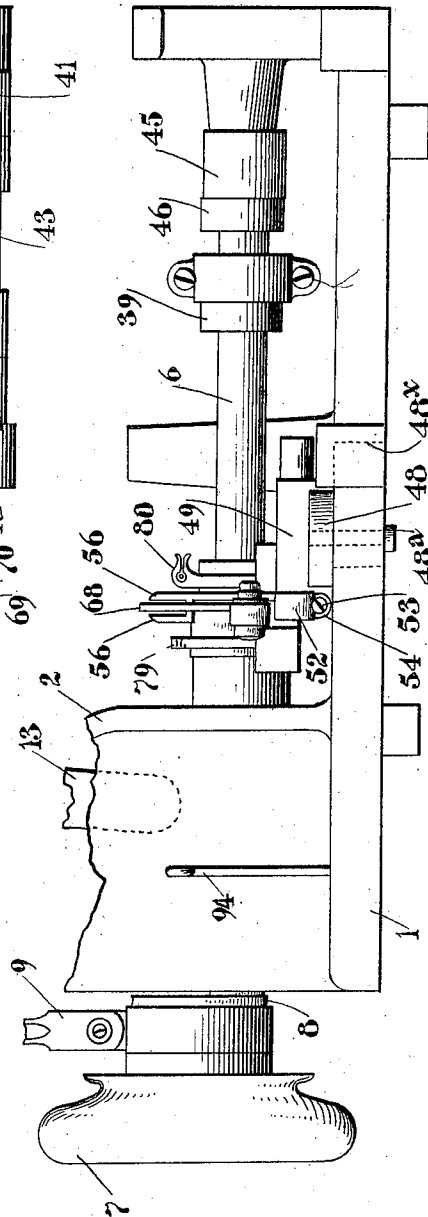


Fig. III.

WITNESSES:
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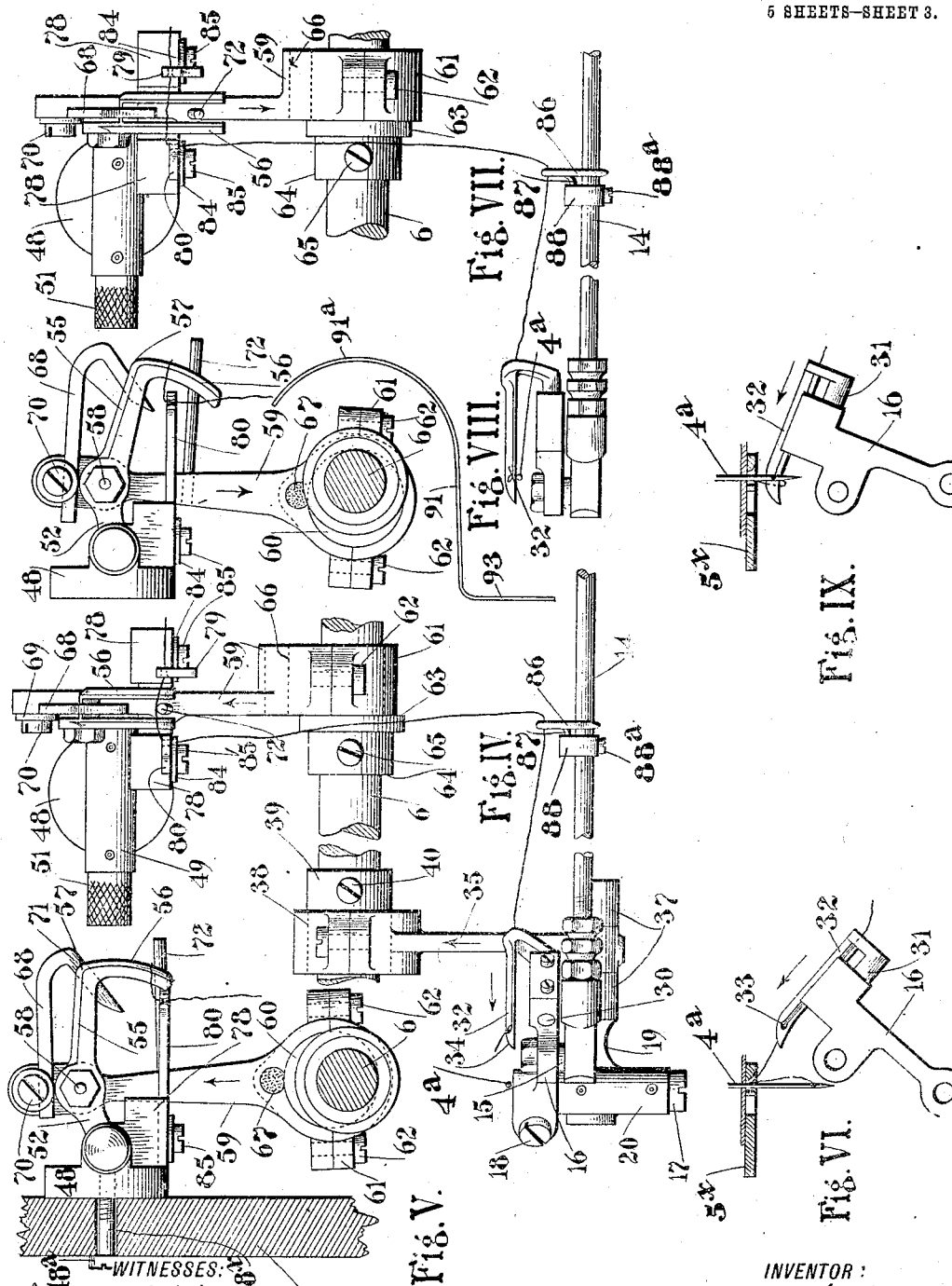
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5 SHEETS—SHEET 3.



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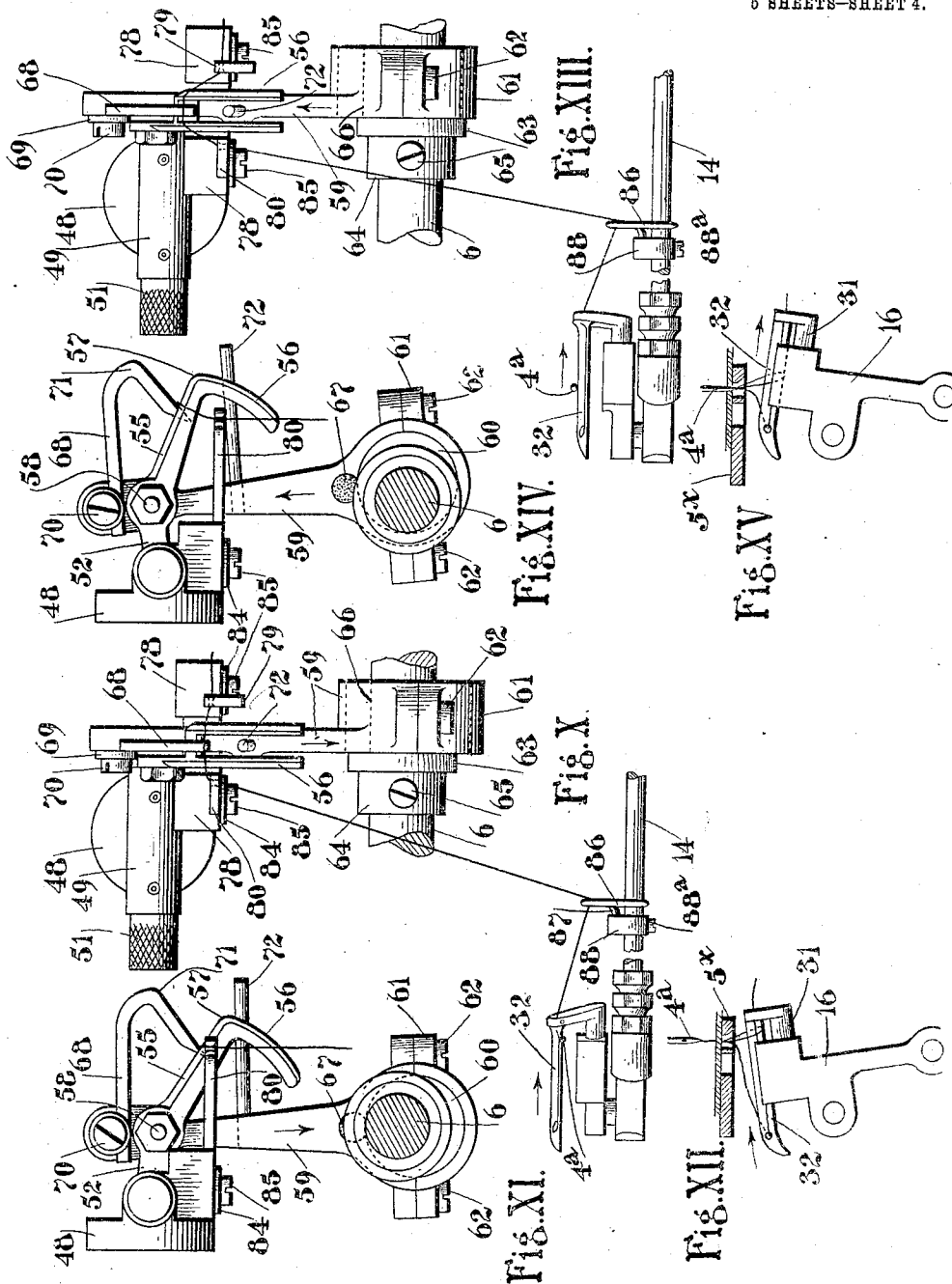
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5 SHEETS—SHEET 4.



WITNESSES:

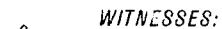
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974,170.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

WILLIAM V. MILLER, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE MANHATTAN MACHINE SUPPLY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

STITCH-FORMING MECHANISM.

974,170.

Specification of Letters Patent.

Patented Nov. 1, 1910.

Application filed December 26, 1903. Serial No. 136,587.

To all whom it may concern:

Be it known that I, WILLIAM V. MILLER, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Stitch-Forming Mechanism, of which the following is a description.

This invention relates to sewing machines of the chain-stitch type, and particularly to the stitch making organization thereof.

An object of my invention is to provide a chain-stitch sewing machine wherein the stitch forming mechanism is adapted for making what is commonly termed a lock-chain stitch, viz., one in which the loops of needle-thread have intertwined with them a loop of looper-thread.

Another object of my invention is to provide a mechanism whereby, in a two-thread chain-stitch machine, the looper-thread will be properly handled so as to supply, and control the supply of, the same in a manner to avoid drag and excess which occur in many stitch-forming organizations.

Another object of my invention is to provide a stitch-forming organization in which the take-up mechanism can be adjusted so as to control the supply of the thread and manipulate the latter in a manner to locate the lock or junction between the needle-loops and the looper-thread in any position desired in or on the work.

Another object of my invention is to provide a stitch-forming organization in which the looper is rendered adjustable to adapt it to any timing of the needle-bar and in conjunction with which adjustment the take-up may be adjusted so as to properly manipulate the looper-thread in accordance with the requirements of the various adjustments of the looper, or the various effects or disposition of the lock desired.

Another object of my invention is to provide a compact and simple organization consisting of a stitch-forming mechanism including a looper, and a take-up mechanism which will handle and control the looper-thread to a nicety and in the precise manner required during the cycle of movement of the looper.

Other objects of my invention will be pointed out during the course of this description and with them all in view, my

invention consists in the parts, features, elements, and combinations of elements and mechanisms hereinafter described and claimed.

Referring to the drawings illustrating one form or embodiment of my invention, Figure I represents in side elevation so much of the bed and overhanging arm of a chain-stitch sewing machine, as is deemed necessary to properly portray my invention, the upper portion of the arm and head of the machine having been removed, as also the work-plate, in order not to confuse the illustration; Fig. II is a top plan view of the bed-plate of the machine, the overhanging arm being broken away, and the view illustrating the relative arrangement of the looper, take-up and feeding mechanisms; Fig. III is a rear elevation of the machine the view intending to illustrate merely the take-up mechanism, the driving-shaft and certain few parts carried thereby; Fig. IV is a skeleton view intended to be, in nature, diagrammatic so as to illustrate the relative position of the stitch-forming and thread-controlling mechanisms as they are in the extreme backward position of the looper; Fig. V is a front end view of a portion of Fig. IV, illustrating the relative arrangement of the parts of the take-up mechanism, this view being disposed so as to bring the parts in Figs. IV and V in lateral alinement, so that the eye may quickly discern the position of parts of the take-up mechanism; Fig. VI shows in front elevation the needle and looper in juxtaposition corresponding with Figs. IV and V; Figs. VII, VIII and IX illustrate, respectively, the same parts in the same way as Figs. IV, V and VI, the looper having moved forward, however, and entered the needle-loop and the other parts being shown in corresponding positions; Figs. X, XI and XII are views, respectively, similar to Figs. IV, V and VI, the looper being shown as having reached its forward extreme and the other parts being shown in corresponding positions; Figs. XIII, XIV and XV are views, respectively, similar to Figs. IV, V and VI, the looper being shown as receding or moving toward its rear extreme and being substantially midway of said movement, and the other parts being shown in corresponding positions; Figs. XVI, XVII and XVIII are

views, respectively, corresponding with Figs. IV, V and VI, showing the needle as having reached a position in which the looper-thread will be carried around the same and the needle-loop retained out of the path of the needle during the descent of the latter beside the looper, and the other parts being shown in corresponding positions; Fig. XIX is a detail view showing a portion of the driving-shaft, the eccentric and strap for actuating the take-up; Figs. XX and XXI show, respectively, a front and side elevation of one of the thread-guides employed in connection with the take-up; Fig. XXII is a top plan showing the take-up bracket journal and supporting shaft; Fig. XXIII is an elevation showing a means for adjusting the thread-supporting or stop pin or post of the take-up mechanism; Fig. XXIV is a plan view of that corner of the bed-plate which is adjacent the looper mechanism, the figure illustrating the means for adjusting the position of the rocking-frame for the looper-carrier; and Fig. XXV is a section on the line XXV—XXV of Fig. XXIV.

Primarily, it is to be understood that while a single thread-carrying looper has been illustrated in the embodiment of my invention made the subject of this application, a plurality of loopers and carriers can be adapted to cooperate with a plurality of needles to form a gang machine, and that irrespective of the number of loopers employed, the take-up mechanism is adapted to manipulate and control the threads thereof. It should also be understood that while the take-up made the subject of this application can be adapted to cooperate with a looper mechanism such as shown herein, the same may be employed in connection with other looper mechanisms or adapted to manipulate and control the needle-thread of any stitch-forming organization. Hence, I do not purpose limiting myself, in certain of my claims, to the combinations including my looper and take-up mechanisms; but purpose, in a series of claims, covering the broad, essential features of my take-up mechanism *per se*, or in any relation in which it is capable of performing its functions.

In the drawings, 1 is the bed-plate, 2 the arm supported thereby, 3 the head in which the needle-bar 4, and presser-bar 5, are supported and operate. The needle 4^a, is held in the needle-bar in any suitable manner and the presser-foot 5^a, is supported by the presser-bar in any usual way. The throat-plate is indicated by 5*. The driving shaft is indicated by 6, the same carrying at its rear end the driving pulley and hand-wheel 7, and adjacent thereto the eccentric 8, which actuates the strap 9, pivotally connected at its upper end to the needle actuating-lever 10, pivoted at 11, to the arm 2, and pivotally

connected at its forward end by means of link 12, to the needle-bar 4. The lever 10, is provided with the depending arm 13, suitably connected to the looper actuating-rod or pitman 14, the front end of which is connected by universal joint 15, to the looper carrier 16, carrying at its lower end the laterally extending journal-pin 17, to which it is clamped by means of the screw 18. A rocking frame 19, affords a journal-bearing 20, for the pin 17 of the looper carrier, the said pin turning freely in said bearing 20. The rocking frame is provided with the depending bearings 21, into which extends a pin 22, set in the bearing 23, of the bracket 24, by means of the set-screw 25, tapped through the bearing and engaging the pin. By this means the rocking frame is adapted to vibrate on the bracket and the looper carrier is adapted to oscillate on the rocking frame, such oscillations being at a right-angle, substantially, to the vibration of the rocking-frame. The bracket 24, is guided in a way formed in the bottom of the bracket-plate 26, which is set in a recess 27, in the bottom of the bed-plate 1. Said recess is of greater dimensions than the bracket-plate in order that the latter may have adjustment longitudinally of the bed-plate. The bed-plate is provided with an enlarged aperture 28, and a corresponding aperture is provided in the bracket-plate 26, a clamping screw 26^a, carried by the bracket 24, extending through both said apertures to the top of the bed-plate where a washer 29, spans the aperture in the bed-plate under the head of the screw for the purpose of clamping the several parts rigidly together in any position of adjustment required. By making the bracket-plate adjustable on the bed-plate and the bracket adjustable on the bracket-plate the two adjustments,—transversely and longitudinally of the bed-plate,—are provided for the looper mechanism.

The looper carrier 16 has a socket 30, in Fig. IV, in its free end into which extends the stem 31, of the looper 32, the latter being longitudinally grooved for the reception of the thread and provided at its forward end with the eye 33, through which the thread runs. The back of the looper adjacent the eye is provided with the rounded portion 34, which has the function of momentarily retaining the needle-loop while the needle is passing down by the looper to have the looper-thread wrapped around it. This will be further explained in the description of operation of the parts.

The rocking frame 19, has its movement imparted by means of the strap 35, which is pivotally connected thereto by means of the journal-pin 36, clamped in the end of the strap and extending into the opposite journals 37, of the rocking frame 19, said strap at its other end surrounding the eccentric

38, secured to the driving shaft adjust-ably,—circularly and longitudinally,—by means of the extended collar 39, and clamping screw 40.

5 A portion of the feeding mechanism is illustrated in Fig. II merely to show the relation thereof with the looper mechanism, said feeding mechanism comprising the rocker 41, the feed-bar 42, journaled on the shaft 43, held in the rocker 41, and provided at its forward end with the feed-dog 44. Any suitable means may be provided for imparting the vertical rise and fall to said bar, such as eccentric 45, secured to the driving shaft by means of the extended collar 15 46, and set-screw 47.

The parts thus far described may be of ordinary character; but the looper mechanism described coöperates particularly, though not necessarily, with the take-up mechanism about to be explained. That is to say, as previously noted, the means provided for adjusting the looper mechanism adapt the latter to be adjusted with reference to the path of reciprocation of the needle, either to the right or the left of the latter or directly in the line of said path, for the purpose of enabling the looper to coöperate with a needle which may, in different machines, be differently timed. The particulars of this will be set forth herein- 20 after and the particular coöperation of the take-up mechanism specifically noted and stated. It must be borne in mind, however, that the take-up mechanism is of universal application and can be adapted, with minor changes within the province of any mechanic, to coöperate with any type of stitch-forming mechanism and manipulate and 35 control either the needle or the looper-thread. This will be apparent during the course of the following description.

On reference to Figs. II, III and XXII it will be seen that the take-up mechanism 45 consists, in this embodiment of my invention, in the bracket 48, herein shown as circular, secured to the bed-plate 1, by means of the set-screw 48^a, passing through the elongated slot 48^x in the bed-plates and into the bracket, thus rendering the latter adjustable at will along the length of the bed-plate for the purpose of disposing the take-up mechanism in any desired position relatively to the looper or other mechanisms of the machine. The bracket 48, carries the journal bearing 49, through which extends the stud or short shaft 50, having the enlarged knurled head 51, at one end which bears against the adjacent end of the bearing 49, and at its other end having clamped thereto the take-up lever 52, by means of the set-screw 53, engaging the wings 54, of the clamping collar on the end of the take-up lever. The take-up lever is thus enabled

to rock freely and is provided with an extended bearing to afford stability and steadiness. The lever 52 has the long arm 55, the free end of which is bifurcated to produce the thread-supporting arms 56, which are curved longitudinally as clearly shown in the several figures. The angle 57, of the arms 56, with the lever-arm 55, is rounded so as not to abrade or fray the thread, this angle constituting the portion over which the thread slides during the take-up action. 75 Between its ends, so as to make the arm 55, considerably longer than the arm 52, the take-up lever has pivotally journaled thereto, as at 58, the outer end of the eccentric strap 59, which encircles at its forward end the eccentric 60, carried by the driving shaft 6, said strap being clamped upon the eccentric by means of the separable piece 61, held by the set-screws 62. As shown clearly in Fig. XIX, the 85 eccentric 60, is provided with the flange 63, which affords a shoulder to prevent the strap from being moved laterally relatively to the eccentric; and to properly and adjustably secure the eccentric to the shaft, it is provided with the laterally extended collar 90 64, through which is tapped the set-screw 65, into engagement with said shaft. This means enables the eccentric 60, to be adjusted circularly and longitudinally. To 95 afford proper lubrication between the eccentric and the strap, the latter is provided with the open-sided bore 66, extended transversely through the strap, the open side being adjacent the eccentric and thus allowing lubricant to be applied freely to the surface of the eccentric by means of a wick 67, inserted in the bore. At its rear end the strap 59, has secured to it, beyond its pivotal connection with the take-up lever, the controlling arm 68, the same being adjustably clamped to the strap by means of the washer 69, and screw 70, the latter passing through the washer and into the end of the strap 59. At its free end the controlling arm is bent so as to provide the controlling 110 finger 71, which is extended between the thread-supporting arms 56, of the take-up. By the adjusting means described, the controlling arm 68, can be set so that its controlling end or finger 71, will project to a greater or less extent beyond the angle 57, of the take-up lever 55, thus providing means for adjusting the amount or extent of the take-up action. The strap 59, carries at a point between its ends a stop-pin or post 72, the same being forced into an aperture 73,—see Fig. XIX,—in said strap so as to hold the pin or post firmly in position. 120 The outer end of the post 72, is caused to extend into the bifurcation between the supporting-arms 56, and the take-up lever, and is so located that at no time during the oper-

ation of the take-up lever will the said post be withdrawn from the bifurcation. If desired, the stop-pin or post 72, may be rendered adjustable on the strap 59, as shown in Fig. XXIII; that is to say, the strap 59, may be provided with a slot 74, extending longitudinally thereof, and a stop-pin 72^x, provide with the overhanging portion 72^a, may be adjustable both longitudinally and transversely of said strap 59. These adjustments are secured by means of a slot 75, in the enlarged base 75^a, of the stop-pin 72^x, said slot extending across the slot 74, in the strap. A screw-bolt, or any other suitable means 76, may pass through the two slots 74 and 75, and the headed ends of said bolt will be caused to tightly clamp the stop-pin to the strap. By this means it will be seen that the stop-pin can be adjusted longitudinally and transversely of the strap. It might be that the construction and adjusting means just described would cause interference of the base of the stop-pin 72^x with adjacent portions of the brackets 78, hence the overhanging portion 72^a of the stop-pin is provided so as to off-set the same from the main portion 72^x. Thus, the stop-pin is adjusted so that its depending finger 72^a extends between the two arms 56 of the take-up lever in the same manner as the straight stop-pin 72, the off-setting just described of said extension enabling the body of the stop-pin to be located quite a distance from the brackets 78, or other adjacent portions, and the adjustments described enabling the extension 72^a to be set properly with reference to the arms 56 of the take-up. Thus, the post is rendered vertically adjustable so as to regulate its height relatively to the supporting arms 56, between which it stands during the operation of the take-up mechanism.

Formed on the bed-plate, or made as an extension of the bearing 49, are two brackets 78, to which are adjustably secured thread-guiding fingers 79 and 80, each of the fingers being provided with the enlarged head 81, through which is a transverse bore 82, into which extends an open-end threading-slot 83. These thread-guiding fingers are disposed on opposite sides of the arms 56, of the take-up lever, and are each rendered adjustable on the bracket 78, by means of the washer 84, and set-screw 85, the washer bearing upon the shank of the guide 79, and clamping the same in a suitably formed groove in the bracket 78. By this means the height of the thread-eyes 82, relatively to the surface of the controlling arms 56, can be regulated at will, for the purpose of providing more or less looper-thread, more thread being furnished on a low adjustment of the guides and less on a high adjustment, as will be obvious. The thread-eyes are disposed on the bracket 78, so that the one 79,

will have its open-end slot 83, extending substantially in the direction of reciprocation of the arms 56, of the take-up lever, while the one 80, is disposed so that said open-end slot will extend substantially at a right-angle to the path of reciprocation of the arms of said take-up lever. In this way the thread is securely retained in the thread-eyes 82, and the guides are prevented from being unthreaded, thus avoiding the necessity for the use of spring retaining devices in the eyes or thread-slots and greatly simplifying and cheapening the construction.

Before entering upon a description of the operation of the stitch-forming mechanism of my invention, attention is directed to the fact that the take-up is adjustable in every part; that is to say, the eccentric 60, has a double adjustment on the shaft 6, by means of the clamping screw 65, and such adjustment being either or both circumferentially to regulate the timing of oscillation of the take-up, or longitudinally of the shaft in order to give the take-up mechanism its proper, or any desired, position on the bed-plate; the supporting bracket is also adjustable upon the bed-plate for the purpose of enabling the proper disposition of the take-up; the thread-controlling arm 68, is adjustable on the eccentric strap 59, so as to regulate the position of its extending end 71, relatively to the take-up lever in order to cast off the thread sooner or later during the backward movement of the said lever; the stop-pin 72, is horizontally adjustable, if desired, to regulate the amount of slack supplied to the looper during its backward movement; so as to permit the stitch to be set on a more or less slack looper-thread and on the downward movement of the needle, thus avoiding strain on the stitch; and the guiding fingers 79 and 80, are adjustable vertically so as to be placed in proper relation to the thread-supporting arms 56, of the take-up lever, so as to control the amount of thread supplied to the looper during its forward movement, and the amount of thread extending between the work and the looper-toe. Thus, it will be seen, that the position of the take-up mechanism on the bed-plate can be controlled, the timing of movement of the take-up lever can be controlled and the positions of the thread-controlling arm 68, the stop-pin 72 and the guiding-fingers 79 and 80, can be controlled. Hence, the amount of take-up action is completely and thoroughly within the control of the operator, as well as the supply of thread to the looper, and the disposition of the take-up mechanism relatively to the looper mechanism is also under control. It will also be seen that the amount of lateral movement of the looper is under control of the operator by means of the adjustable eccentric 38, and that the looper mechanism can be adjusted

and regulated relatively to the path of reciprocation of the needle so as to enable the looper to properly cooperate with the needle in any machine to which the looper mechanism may be applied.

To keep the thread, extending from the take-up to the looper under control, and aid the take-up in its action in drawing in and setting the stitch, a device which may be termed a thread-controller or auxiliary take-up is applied to the reciprocating looper-actuating rod or pitman 14, said device consisting in the guide 86, having an end 87, thereof, bent at an angle and suitably held in a clamp 88, encircling the pitman 14 and clamped thereto by screw 88^a, so as to be adjustable on said pitman. To engage the thread, the guide is made in the form of a loop or hook, which presents its back to the take-up mechanism and one side to the looper mechanism. This disposition prevents the thread from being released from the hook. The idea of this adjustment is to enable a proper disposition of the thread-controller relatively to both the take-up and looper mechanisms, whereby during the operation of the stitch forming mechanism the thread leading from the take-up to the looper may be properly handled and the slack controlled and the take-up aided in its action in setting the stitch. It will be noted that the thread runs from any usual supply through the guide 94, located on the bed-plate or any portion of the frame of the machine, then through the guiding-finger 79, over the supporting arms 56, of the take-up lever, behind the pin 72, and then through the guiding-finger 80, to the thread-controlling hook 86, and then to the looper. To prevent the thread in its passage from the take-up to the thread-controller from having contact with the driving shaft or other adjacent portions to which lubricant is usually applied, a shield 91, is secured to the bed-plate by means of set-screw 92, extending through the horizontal portion or base 93, of said shield, into the bed-plate 1. Preferably, the shield is made angular, as shown in the several figures, so as to present the vertical portion 91, between the thread-controller and the driving shaft, and has an overhanging portion 91^a, which completely covers and shields the take-up eccentric, a portion of the shaft and a portion of the strap 59, thus preventing any contact of the thread with the said operating parts of the machine.

I will now describe the mode of operation of my stitch forming mechanism.

Primarily, it will be understood that the needle-bar is vertically reciprocated from the connections with the driving shaft, the looper is reciprocated and laterally vibrated from the connections with the driving shaft, and the take-up is oscillated from the con-

nections with the driving shaft. The stitch to be made is the well-known lock-chain stitch, or one wherein a loop of the looper-thread passes through a loop of the needle-thread and encircles the next adjacent loop of the needle-thread; or in other words, one wherein a loop of needle-thread extends through a loop of the looper-thread and passes around a second loop of the looper-thread. This is a desirable form of stitch and one which it has been endeavored to make perfectly with a simple, accurate mechanism for many years. Referring to Figs. IV, V and VI, it will be assumed that the needle has reached its lower extreme and is slowly retrograding to throw out its loop, the looper is moving forward from its rear extreme and simultaneously moving laterally toward the back of the needle so as to go behind the latter; the take-up has begun to move forward under the thread which extends from one thread-eye to the other over the supporting arms 56, the action of the said arms upon the thread being such as to prevent an excess of slack; and the controller 86 is moving forward and giving up the thread as the looper moves forward so that the thread may not drag in the looper, thus controlling the slack between the take-up and the looper. Referring to Figs. VII, VIII and IX, it will be seen that the needle has retrograded, thrown out its loop, the looper has moved forward so that its toe has entered the loop and is now passing into the loop as the needle rises above the throat-plate; the take-up has moved forward substantially one half its distance and the slack is still under control thereby; and the controller is still moving forward with the looper and giving up the thread according to the requirements of the latter. Referring to Figs. X, XI and XII, it will be seen that the needle has risen to substantially its upper limit, the looper has moved to its forward limit and is about to move laterally toward the front of the machine, the needle-loop having slipped to the rear end of the looper body and the looper-thread extends through the same, through the eye of the looper and back to the work in the last stitch made; the take-up has reached its forward extreme, the thread having slipped along the arm 55, thereof, into contact with the supporting end 71, of the controlling finger 68; and the thread controller having followed the looper, giving up thread in accordance with the demands of the latter, and is now about to return with the looper. Referring to Figs. XIII, XIV and XV, it will be seen that the looper is returning to its rear extreme having covered substantially one half the distance and is moving in a plane in front of the path of reciprocation of the needle, the latter being now descending and having en-

tered the throat-plate, the previously formed needle-loop is slipping toward the toe of the looper and the looper-thread extending between the work and the eye of the looper is being gradually shortened; the take-up is moving toward the rear as is also the controlling finger 68, the speed of the take-up in this backward movement, obviously, being greater than that of the controlling finger, because the finger has only the speed of the eccentric strap 59, while the speed of the take-up is augmented by reason of its stationary pivotal support and the length of its arm 55, this movement causing the thread, extending from guide to guide around the take-up arm 55, to be drawn toward the rear and to ride up the take-up arm, thus drawing in the slack between the eye of the looper and the last stitch formed proportionately to the movement of the looper toward the rear; and the thread controller is moving toward the rear with the same speed as the looper, and in so doing, is controlling the excess of slack which occurs between the take-up and the looper. Referring to Figs. XVI, XVII and XVIII, it will be seen that the needle has reached a position with its point slightly below the body of the looper, the latter having reached a position which places its enlargement about its eye adjacent the needle, and said enlargement momentarily retaining the previously formed needle-loop on the body of the looper out of the way of the needle, while the looper is drawing its thread about the body of the needle, consequently about the body of the loop which is next to be made by the continued downward movement and consequent retrograde of the needle. The take-up has moved to its rearward extreme, and likewise the controlling finger 68, resulting in forcing or lifting the looper-thread over the angle 57, between the arms 56, and the arm 55, of the take-up lever; this was the climax of the stitch-setting operation, inasmuch as the take-up had drawn the looper-thread to the rearward extreme, held the same taut while the needle was descending and consequently drawing its thread taut, and the controller was moving back with the looper and helping to take up the slack in the looper-thread. The parts next reach the position of Figs. IV, V and VI, viz., the needle its lower limit and being about to rise to throw out the second loop, the looper its rearward extreme and moving laterally toward the rear of the needle and moving forward again for engagement with the second loop, and the take-up moving forward to control the slack of looper-thread, the latter having slipped forward over the supporting arms 56, and against the stop-pin 72; during this time, however, the controller 86, has moved to its rearward extreme, thus increasing the

angle of the thread, —see Fig. IV,— and controlling the slack thereof caused by its slipping forward on the take-up arms into engagement with the stop-pin.

From the above it will be seen that the looper-thread is at all times during the stitch forming operation under absolute control, no excess of thread being allowed at any time about the point of the looper or the point of the needle which would result in entangling the threads or the skipping of stitches. And it will also be seen that the stitch is set on the downward movement of the needle and with the needle-thread, being drawn close to the work by the downward movement of the needle and against the looper-thread which, though under control, is not taut nor rigid, thus avoiding strain on both the needle and the looper threads. Obviously, adjustments of the elements of the take-up mechanism will result in the setting of the stitch earlier or later in the downward movement of the needle, and in consequence the lock, or junction between the needle and looper-threads, can be controlled and its position in the work located to a nicety. And with special reference to the adjustment of the looper and take-up mechanisms individually as a whole and relatively to each other, it will be understood that, in different machines, the reciprocations of the needles and the downward thrust of the latter, though predetermined, will vary considerably and, hence, in a given machine, to which it may be desirable to apply the looper mechanism of my invention, it will be necessary to adjust the position of the latter so as to properly cooperate and be in time with the needle. This is accomplished by making the looper mechanism universally movable and adjustable on the bed-plate of the machine as described. When the proper cooperative relation between the looper and the needle has been thus established, it is necessary to properly locate the take-up mechanism, as a whole, in the machine and relatively to the looper, this being accomplished with my take-up mechanism by reason of having the latter carried by a bracket and operable from an adjustable eccentric carried by the driving shaft. Having made this general adjustment in the machine, which accommodates the take-up mechanism to any type of stitch-forming mechanism, fine and accurate adjustments may be made by regulating the position of individual elements of the take-up, as described, so as to control the requisite amount of slack drawn in and given up and to determine the position of the lock of the stitch in the work. Furthermore, it will be seen that the construction of my take-up mechanism is such that it will work, control the thread and perform all its functions with equal facility irrespective of the direc-

tion of rotation of the driving shaft, and that if the thread should break there is no possibility of its becoming entangled with the parts or wound upon the driving shaft. These are common faults in prior constructions and of frequent occurrence.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A stitch forming mechanism comprising a needle, looper and take-up, means for actuating the several elements, and the take-up comprising in its structure an oscillating lever and an oscillating controlling finger arranged adjacent said lever and cooperating therewith to receive the thread as it slips from the take-up.

2. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same, and the take-up comprising a bifurcated lever and an oscillating controlling finger arranged adjacent said lever and cooperating therewith to receive the thread as it slips from the take-up.

3. A stitch forming mechanism comprising a needle, a looper and a take-up means for actuating the same, and the take-up comprising a lever and a thread controlling finger arranged so that the thread may slip from one to the other and the movements of one being given at a higher speed than the other.

4. A stitch forming mechanism comprising a needle, a looper, a take-up and means for actuating the same, and the take-up comprising an oscillating lever, a pair of stationary thread-guides and an oscillating thread-controlling finger arranged adjacent said lever and cooperating therewith to receive the thread as it slips from the take-up.

5. A stitch forming mechanism comprising a needle, a looper, a take-up and means for actuating the same, and the take-up comprising an oscillating lever, a stop-pin, a vibratory controlling finger cooperating with said lever, and a pair of thread-guides.

6. A stitch forming mechanism comprising a needle, a looper, a take-up and means for actuating the same including a reciprocating part, the take-up comprising a lever pivoted to said part and a controlling finger fixed to the latter.

7. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same including a gyratory part, the take-up comprising a lever pivoted to said part and a controller fixed to the latter.

8. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same, and the take-up including an oscillating lever, a pair of thread-guides arranged on opposite sides of the path of oscillation of the lever, and a thread

controlling finger arranged adjacent to the lever and cooperating therewith to receive the thread as it slips from the take-up.

9. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same, and the take-up including an oscillating lever, a cooperating controlling finger moving relatively to said lever and a pair of cooperating thread-guides, and means for adjusting the thread-guides relatively to the lever.

10. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same, and the take-up including an oscillating lever, a pair of cooperating thread-guides and a reciprocating thread controlling finger, and means for adjusting the controlling finger relatively to the lever.

11. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same, and the take-up including a pair of thread-guides oppositely disposed, an oscillating lever and a thread controlling finger arranged adjacent said lever and cooperating therewith to receive the thread as it slips from the take-up, the finger and the lever having movements toward and from the thread-guide.

12. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same, the take-up including a pair of thread-guides, a lever oscillating between the same, a vibratory stop-pin cooperating with the lever, and means for adjusting the stop-pin relatively to the lever.

13. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the take-up including a reciprocating part, and the take-up comprising an oscillating lever, a pair of thread-guides, and a stop-pin connected to the reciprocating part.

14. A stitch forming mechanism comprising a needle, a looper and a take-up, means for actuating the same including a reciprocating part, and the take-up comprising an oscillating part, a moving pin, and means for adjusting the pin relatively to the said oscillating part.

15. A sewing machine comprising a stitch forming mechanism and a take-up, the latter including an oscillating lever, a pair of thread-guides and a thread controlling finger, arranged adjacent said lever, and means for bodily adjusting the several parts of the take-up relatively to the stitch forming mechanism.

16. A sewing machine comprising a stitch forming mechanism and a take-up, the latter including a pair of thread-guides, an oscillating lever and a controlling finger, means for adjusting the finger relatively to the lever, and means for bodily adjusting the sev-

eral parts of the take-up relatively to the stitch forming mechanism.

17. A sewing machine comprising a stitch forming mechanism and a take-up, the latter including a pair of thread-guides, a lever and a thread controlling finger, means for adjusting the guides and finger relatively to the lever, and means for bodily adjusting the several parts of the take-up relatively to the stitch forming mechanism.

18. A take-up mechanism for sewing machines comprising a supporting bracket, a lever pivoted thereto, a controlling finger, arranged adjacent said lever and cooperating therewith to receive the thread as it slips from the take-up, and means whereby movement may be imparted to both the lever and the finger.

19. A take-up mechanism for sewing machines comprising a supporting bracket, a lever pivoted thereto, a controlling finger and a stop-pin, arranged adjacent said lever, and means whereby movement may be imparted to said pin, finger and lever.

20. A take-up mechanism for sewing machines comprising a supporting bracket, a lever pivoted thereto, means whereby the lever may be oscillated, and a controlling finger supported by a part of said means and cooperating with the lever to receive the thread as it slips from the latter.

21. A take-up for sewing machines comprising a supporting bracket, a lever pivoted thereto, means for oscillating said lever,

a controlling finger and a stop-pin, both cooperating with said lever and actuated by said means.

22. A take-up mechanism comprising a supporting bracket, a lever pivoted thereto, a pair of thread-guides connected to said bracket, a controlling finger cooperating with the lever to receive the thread as it slips from the latter, and means whereby the lever and finger may be oscillated.

23. A take-up mechanism for sewing machines comprising a supporting bracket, a lever pivoted thereto, a pair of thread-guides adjustably connected to said bracket, a finger cooperating with the lever to receive the thread as it slips from the latter, and means whereby the finger and the lever may be actuated.

24. A take-up mechanism for sewing machines comprising a supporting bracket, a lever pivoted thereto, a pair of thread-guides connected to the bracket, means whereby the lever may be actuated, and a cooperating thread controlling finger connected to said means arranged adjacent said lever and cooperating therewith to receive the thread as it slips from the take-up.

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

WILLIAM V. MILLER.

Witnesses:

CHAS. MCC. CHAPMAN,
M. HERSKOVITZ.