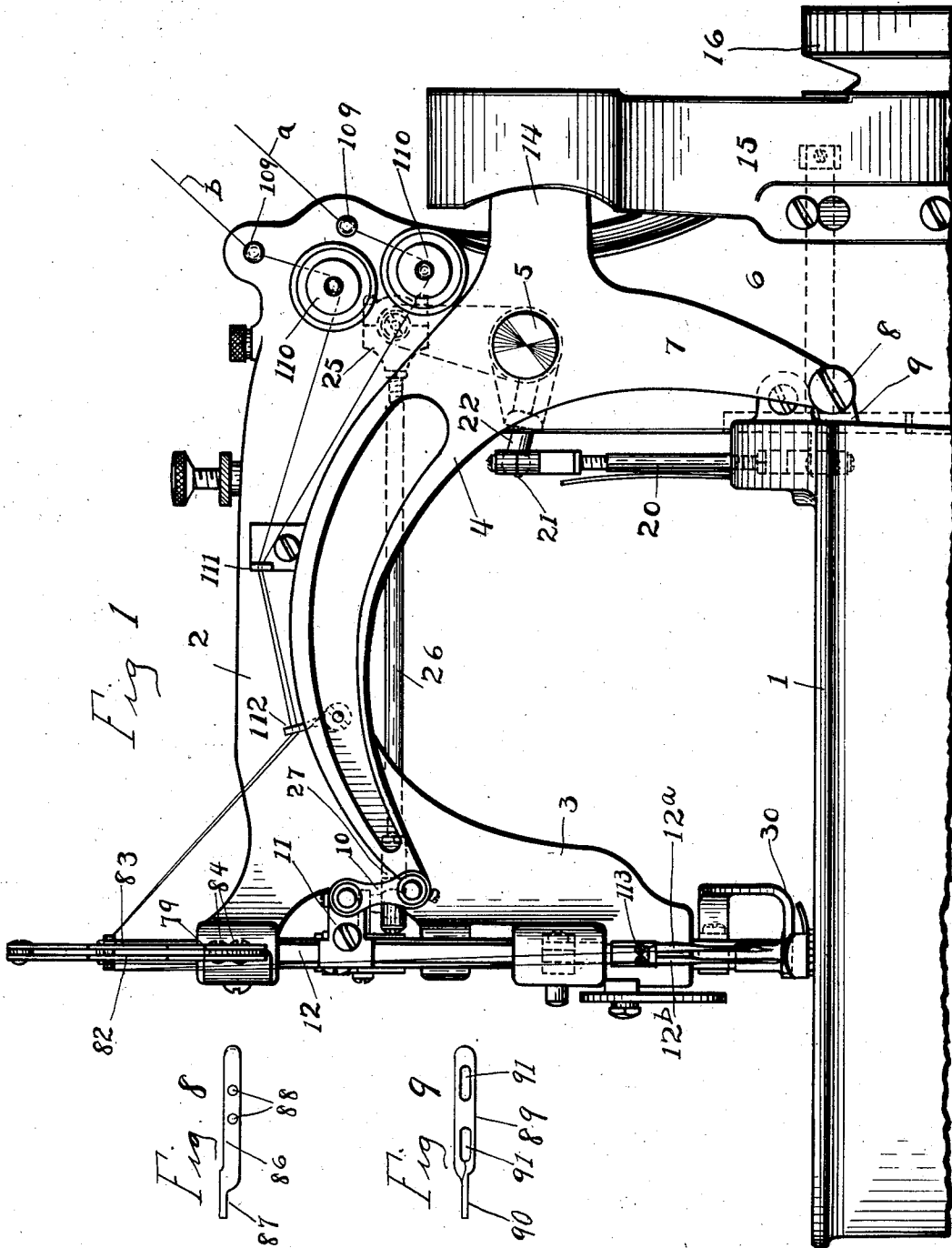


J. P. WEIS.
 STITCH FORMING MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED JAN. 2, 1908.

1,010,831.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 1.



WITNESSES:
M. Hankovitz
J. E. Harris

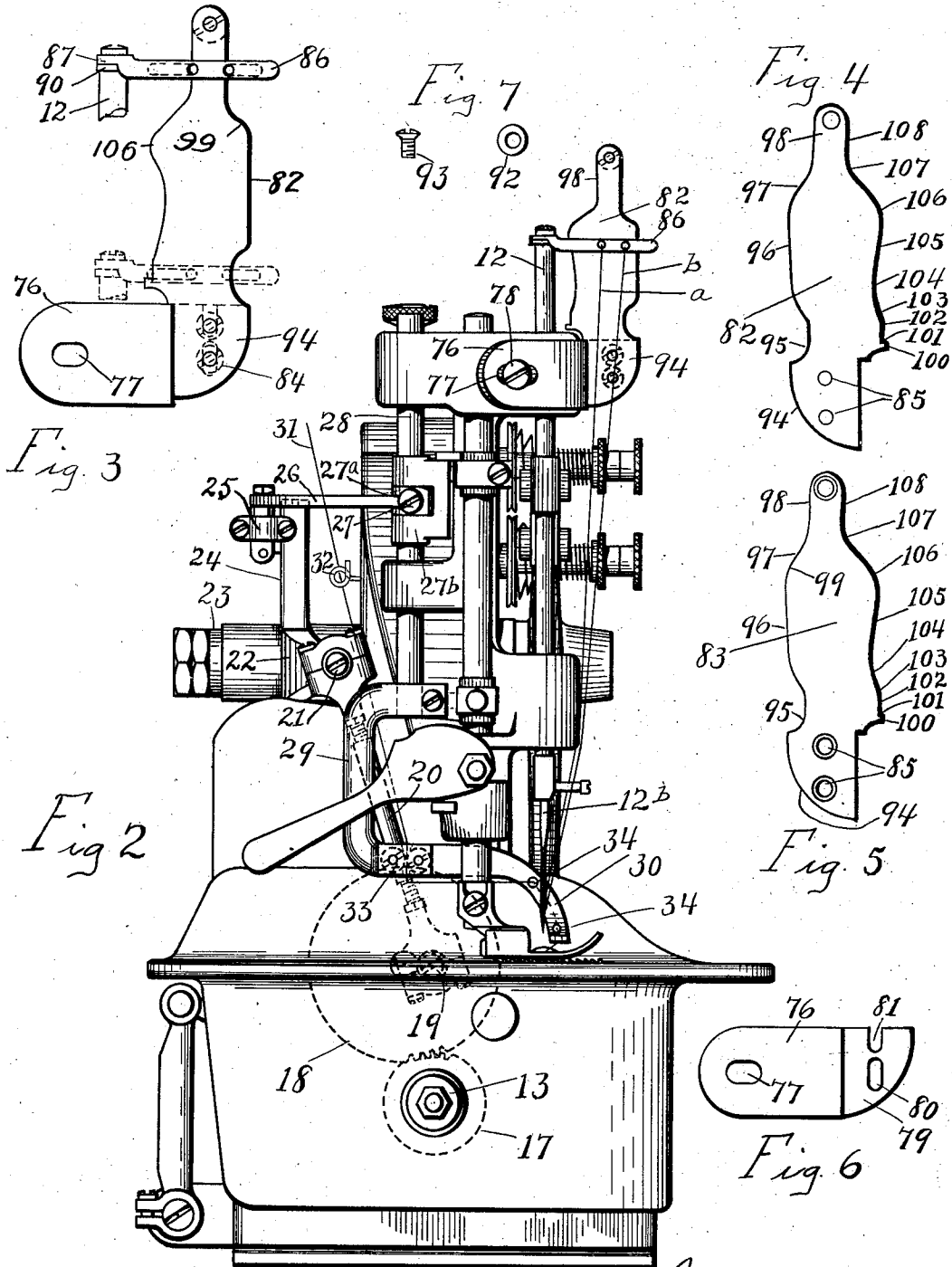
INVENTOR:
John P. Weis
 BY *W. H. Chapman*
 ATTORNEY.

J. P. WEIS.
 STITCH FORMING MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED JAN. 2, 1908.

1,010,831.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 2.



WITNESSES:
 M. H. K. K. K.
 J. Z. K. K.

INVENTOR:
 J. P. Weis.
 BY
 J. M. K. K.
 ATTORNEY.

J. P. WEIS.
 STITCH FORMING MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED JAN. 2, 1908.

1,010,831.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 3.

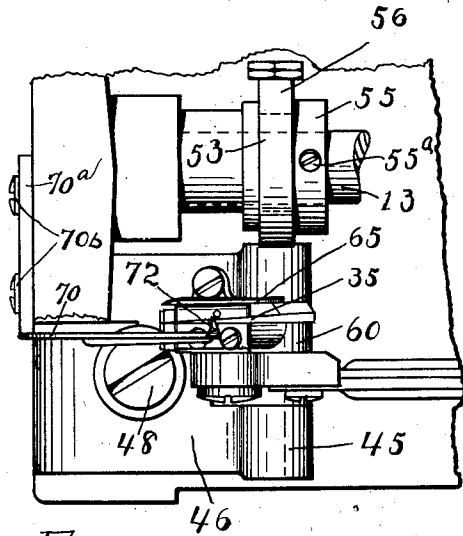


Fig 10

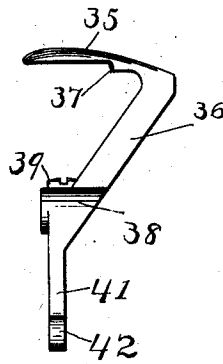


Fig 13

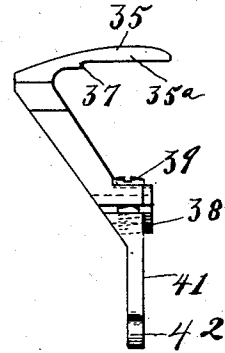


Fig 14

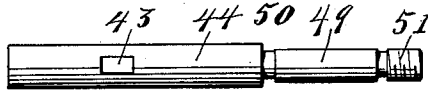


Fig 15

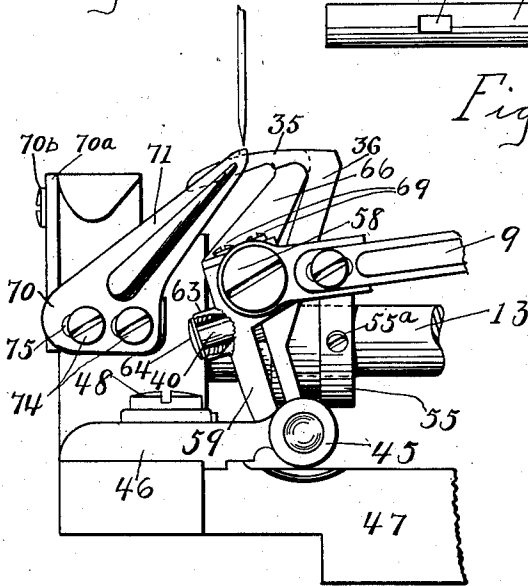


Fig. 11

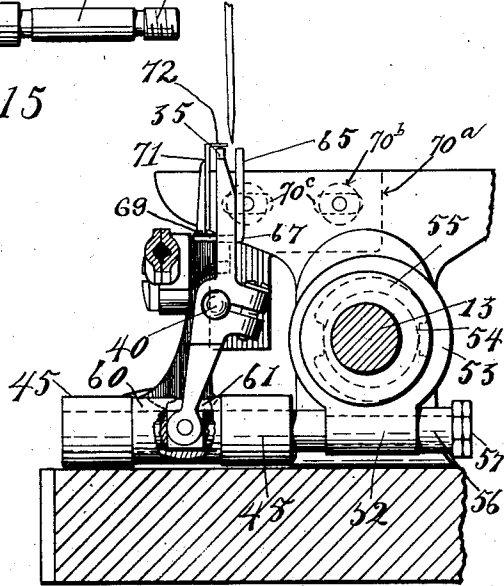


Fig. 12

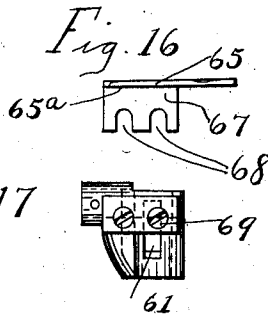


Fig 17

WITNESSES:

M. H. Kohnitz
F. E. Nares

INVENTOR:

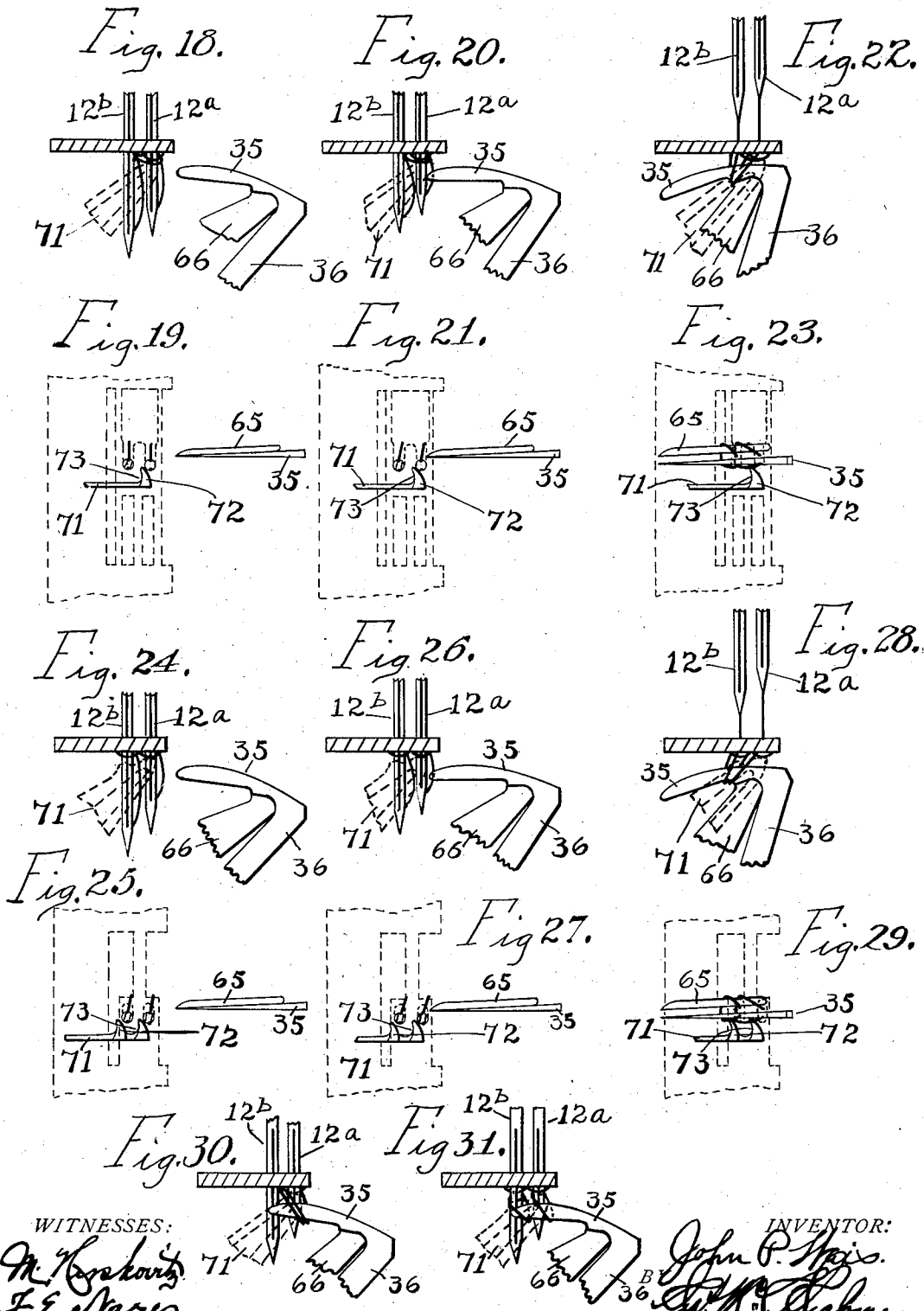
John P. Weis
Wm. M. Chapman
 ATTORNEY.

J. P. WEIS.
 STITCH FORMING MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED JAN. 2, 1908.

1,010,831.

Patented Dec. 5, 1911.

4 SHEETS-SHEET 4.



WITNESSES:
M. K. Kerkhofs
J. E. Nares

INVENTOR:
John P. Weis.
 BY *W. H. Chapman*
 ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN P. WEIS, OF NYACK, NEW YORK, ASSIGNOR TO METROPOLITAN SEWING MACHINE COMPANY, OF NYACK, NEW YORK, A CORPORATION OF NEW YORK.

STITCH-FORMING MECHANISM FOR SEWING-MACHINES.

1,010,831.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed January 2, 1908. Serial No. 409,043.

To all whom it may concern:

Be it known that I, JOHN P. WEIS, a citizen of the United States, residing in Nyack, county of Rockland, and State of New York, have invented a new and useful Improvement in Stitch-Forming Mechanism for Sewing-Machines, of which the following is a description.

This invention relates to sewing machines and, particularly, to the stitch-forming mechanism thereof.

Among the objects of my invention may be noted the following: to provide a chain-stitch-forming mechanism by which a plurality of threads can be accurately and perfectly controlled throughout the stitch formation by the combination and coöperation of a few, simple and inexpensive parts; to provide a stitch-forming mechanism whereby two lines of chain-stitches can be produced in parallelism with or without a connecting thread; to provide a stitch-forming mechanism wherein a two-part looper, in combination with other simple elements, is enabled to produce parallel rows of chain-stitches with a high degree of accuracy and certainty and without the possibility of skipping stitches irrespective of the speed of the machine; to provide a stitch-forming mechanism including certain simple elements whereby the threads are positively and accurately handled both above and below the work, thus preventing the formation of slack either above or below the work and hence preventing the production of loose and unsightly stitching.

With the above objects in view, and others which will be detailed during the course of this description, my invention consists in the parts, features, elements and combinations of elements hereinafter described and claimed.

In the drawings forming part of this description: Figure 1 shows in side elevation the upper part of the frame of a sewing machine having my invention applied thereto; Fig. 2 is a front end elevation of the machine; Fig. 3 is a side elevation of the take-up detached from the machine and showing the thread-guiding take-up arms, which are attached to the needle-bar, in two positions; Fig. 4 is a side elevation of one of the take-up plates; Fig. 5 is a side elevation of the other of the take-up plates; Fig. 6 is an elevation of the supporting-plate for

the take-up; Fig. 7 is an elevation of the screw and washer employed in securing the two plates of the take-up properly together at their upper ends; Figs. 8 and 9 show, respectively, the two styles of thread-guiding take-up arms which are supported by the upper end of the needle-bar for coöperation with the take-up plates and forming part of the take-up; Fig. 10 is a top-plan view of a portion of the looper mechanism, illustrating the same in a certain position; Fig. 11 is a front elevation of the mechanism shown in Fig. 10, a part of this figure being shown in section; Fig. 12 is a rear end elevation of the mechanism shown in Fig. 10; Fig. 13 is a front and Fig. 14 is a rear view of the looper; Fig. 15 is a top-plan of the looper-shaft; Fig. 16 is a top-plan of the spreader portion of the looper; Fig. 17 is a detail plan view of the looper-journal bearing; and Figs. 18 to 31 are views intended to illustrate diagrammatically the various steps in the process of forming a stitch according to my invention.

Referring to the drawings, the numeral 1 indicates the work-plate of the machine, 2 the overhanging-arm, 3 the head of the machine, 4 the needle-lever fulcrumed at 5 to the vertical portion 6 of the frame, said lever having the depending arm 7, to which is pivoted at 8 the looper-actuating rod 9, and which lever, at its forward end, is pivotally connected by link 10 with the clamp 11 rigidly secured to the needle-bar 12, which latter is caused thereby to vertically reciprocate in the head of the machine, wherein it has bearings. The driving-shaft 13 is provided at its rear end with the usual eccentric, not shown, which actuates the usual eccentric strap and rod, not shown, which is, in turn, pivotally connected at its upper end in the usual manner to the rearwardly-extending arm 14 of the needle-lever 4. This is such a common construction that it has been deemed unnecessary to illustrate the same. The hood 15, secured to the frame of the machine, covers the eccentric and its strap and rod; and 16 is the usual driving-pulley of the machine. The driving-shaft 13, near its rear end, is provided with the pinion 17, which meshes with the gear 18, both shown in dotted lines in Fig. 2, the gear 18 being provided with a crank 19 engaged by the lower end of the pitman 20, the upper end of which latter is ball-

jointed at 21 to the short arm 22 of the bell-crank lever journaled on the rearward extension 23 of the needle-lever pivot 5, the other arm 24 of the bell-crank lever being ball-jointed at 25 to the connecting-rod 26 extending forward into pivotal connection at 27 with the extension 27^a clamped to the bar 28 journaled in the guide-yoke 27^b and in the head of the machine, said bar having clamped to the lower end thereof a substantially U-shaped, vertically-disposed frame 29, the lower arm of which is provided with the forwardly-reaching and downwardly-extending thread-finger 30 provided with guide-eyes in its end for leading the thread into a position such that it may be laid, in ornamental fashion, back and forth across the line of seam, or so as to make a type of cross-stitches as will be readily understood. The thread 31 is carried to the thread-finger 30, through the guide-eye 32, guide 33 carried by the lower arm of the frame 29 and guide-eyes 34 in the lower portion of the thread-finger. The needle-bar carries the needles 12^a and 12^b, the former of which is the shorter, on account of the fact that it is nearer to the point of the looper as the latter moves forward to take the loops of needle-thread and is the first to cooperate with the looper as the needles rise to throw out their loops for the purpose.

Coöperating with the needles is a primary looper 35, the form of which is substantially that shown in Figs. 13 and 14, the same having, near its shank 36, a loop-holding shoulder 37, and the shank 36 being formed into a split-bearing 38 provided with a screw 39 for clamping the shank to its supporting-pin 40, said shank also having the straight, depending portion 41, the lower end of which is formed into the circular enlargement 42, which enters the slot 43 of the looper-shaft 44, which is journaled in bearings 45 carried by the bracket 46 secured to the bed-plate 47 of the machine by means of the bolt or screw 48. The shaft 44 is provided with the reduced extension 49, which forms with the main portion of the shaft a shoulder 50, and which has, at its extreme outer end, the screw-threaded portion 51. Surrounding the portion 49 of said shaft is the sleeve-portion 52 of the eccentric-strap 53, which surrounds the eccentric 54 shown in dotted lines in Fig. 12, which is secured to the driving-shaft 13 by means of the collar 55 and spot-screw 55^a, the said sleeve-portion 52 being held in proper position upon the portion 49 of the shaft 44 and at one end against the shoulder 50, by means of the collar 56 and nut 57 secured upon the end 51 of the shaft. The eccentric and strap, thus connected to the shaft 44, give to the latter right-line reciprocations through its bearings 45, and said shaft, by reason of its connection with the tail-portion 41 of the

looper-shank, gives to the looper, on its journal-pin 40, a lateral vibratory movement substantially at a right-angle to its length. The longitudinal movement of the looper is imparted through the rod 9 pivotally connected at 58 to the looper-support 59 journaled at its lower end upon the shaft 44 by means of its sleeve 60, the latter having, through its top, an aperture 61, through which projects the enlargement 42 of the tail-piece 41 of the looper-shank, thus permitting the looper to have its lateral vibration without impediment by the sleeve 60, and at the same time permitting said looper to have its longitudinal movement imparted by the looper-support 59, as the latter is oscillated by the rod 9. The looper-support 59 is provided with the bearing 63 in which the fulcrum-pin 40 of the looper is journaled, said pin being retained in said bearing by means of the head 64 at one end and the looper-shaft clamped to its other end. Thus, the looper is permitted lateral vibratory movements on the looper-support, while, at the same time, partaking of the oscillatory movements of said support.

Carried by the looper-support 59, above the journal of the looper thereon, is a secondary looper 65 carried by a shank 66, the lower end of which is bent at a right-angle to provide a supporting-base 67 having a couple of open-end slots 68 for the purpose of attaching it adjustably to the top of the looper-support, said base being held by means of a couple of screws 69 passing through said slots 68 and tapped into the looper-support, as shown in Fig. 17. By this means, a suitable amount of lateral adjustment of the secondary looper on the looper-support is provided for; and it will be noticed that the secondary looper is fixed to the looper-support and, in consequence, partakes of its movements entirely and has none of the lateral vibrations of the looper proper. The back 35^a of the looper,—see Fig. 14,—is made flat and the adjacent face of the secondary looper is also made flat, as shown at 65^a in Fig. 16, these two flat surfaces being provided for the purpose of enabling the looper and secondary looper to lie as close as possible together during one movement thereof, as will be presently explained, and it will also be noted that the two looper parts are co-extensive at their forward ends so as to produce a single loop-entering point for primary engagement of the loops of needle-thread, this being clearly shown in the diagrammatic views and also in the top-plan of Fig. 10.

For the purpose of holding the loops of needle-thread momentarily in proper position for subsequent needle penetration, I have provided a loop-retainer consisting of the supporting-shank 70 and inclined body-portion 71 having on its back, considering

the direction of feed, one or more loop-detecting fingers 72, the same being shown as slightly curved and producing, in combination with the adjacent portion of the retainer-body, notches or recesses 73 on which the loops of needle-thread may be temporarily held, the said retainers being in the nature of hooks upon which the loops of needle-thread may be impaled. This retainer is supported on the frame of the machine in advance of the stitching position and the inclination of its body is given toward the stitching position, in order that its loop-retaining hooks or fingers may be properly positioned relatively to the path of reciprocation of the needles and relatively to the path of movement of the looper. The loop-retainer is supported in proper position on the machine by means of the bracket 70^a adjustably secured to the front standard of the machine by screws 70^b passing through elongated slots 70^c in said bracket and tapped into said standard, as shown in Figs. 11 and 12. This adjustment enables the retaining-hooks 72 to be moved laterally toward and from the body of the looper, or in a path parallel with the feed. The supporting-shank 70 is adjustably secured to the bracket 70^a by means of the screws 74 passing through the elongated slots 75 and tapped into said bracket. This adjustment permits the retaining-hooks 72 to be moved to and fro in a path at a right-angle to the path of feed or substantially parallel with the longitudinal axis of the looper. This mode of attachment of the supporting-shank 70, provides for a proper amount of adjustment of the retainer relatively to the path of reciprocation of the needles and the paths of movement of the looper, so as to get the proper effects, which will be presently referred to.

From the foregoing description, it will be seen that the stitch-forming mechanism comprises essentially one or more needles, a two-part looper and a loop-retainer having one or more fingers or hooks for temporarily holding the needle-loops; and that the two parts of the looper so coöperate as to enter the loop together and then separate so as to open the loop and carry it in open form into engagement with the loop-retainer where it is temporarily held so that the needle in its descent may pass therethrough and thus make a chain-stitch.

In a two-needle machine, owing to the fact that the looper reaches one needle before it does the other, after the needles have retrograded and thrown out their loops, the inner needle, or the needle which the looper reaches first, must be set a little higher than the outer needle, in order that the loop of the outer needle may not be carried above the path of movement of the point of the looper in the forward movement of the

latter to catch and manipulate the loops. This arrangement of the needles produces a difficulty in the control of the two needle-threads in the matter of permitting the loop formation as the needles move upwardly and in the matter of drawing in the loops to set the stitch; that is to say, the same manipulation of each needle-thread would not produce the proper effect in the two lines of stitching, since one thread would be drawn into the work more than the other and one line of stitching would be tighter than the other. This would be defective work and would result in spoiling the product. To overcome this disadvantage, I have equipped my machine with a special form of take-up calculated to control and properly manipulate the two needle-threads, draw them in evenly and set the stitches with the same degree of tension, and thus produce lines of stitching having precisely the same appearance.

My take-up is shown in Figs. 1 to 9, which will now be specially referred to. The take-up support consists of the angular plate 76 shown particularly in Figs. 2, 3 and 6, the main part of which is provided with the elongated slot 77 through which the screw 78 is passed and which screw is tapped into the head of the machine. The elongation of the slot provides for the necessary lateral adjustment of the support upon the head of the machine, in order to properly position the take-up plates relatively to the needle-bar for producing the requisite action upon the two threads during the operation of the machine; that is, regulate the take-up action on either thread. The supporting-plate is curved longitudinally and at its end opposite the slot is provided with the angular extension 79 in which the vertical, elongated slot 80 is formed, and in which the open-end slot 81 is formed, these two slots being in substantial alinement. The take-up plates are two in number, one of which is indicated by 82 and the other of which is indicated by 83, these two plates being arranged as shown in Fig. 1 and adjustably secured to the angular extension 79 of the supporting-plate by screws 84 which pass through apertures 85, in said take-up plates, and the respective slots 80 and 81 in the said angular portion. Each plate has substantially the same form, as clearly illustrated in Figs. 4 and 5, and, when placed together and in parallelism, as shown in Fig. 1, are arranged on opposite sides of the angular portion of the supporting-plate, so as to space the same sufficiently for the free movement of one of the thread-guiding arms,—of which there are three,—carried by the top of the needle-bar. These thread-guiding arms are shown in detail in Figs. 8 and 9, the one 86 being provided with the apertured supporting-shank

87 at one end and with two thread-guiding apertures 88 in the body-portion so located as to extend on opposite sides substantially of a line drawn centrally of the take-up plates from top to bottom of the latter; while the other thread-guiding arm 89, shown in Fig. 9, is provided with the apertured supporting-shank 90 and in its body-portion with the elongated slots 91. In operation, the thread-guiding arm 89, of Fig. 9, is located so as to operate in the space between the two take-up plates, while two arms 86, such as shown in Fig. 8, are located one on each side of the combined take-up plates, as clearly indicated in Fig. 1. The top of the take-up plates are extended to a position slightly above the upper limit of movement of the needle-bar and, in consequence, of the thread-guiding arms, and are rigidly joined together by means of the interposed washer 92 and the clamping-screw 93, shown in detail in Fig. 7. By means of the elongated slots in the angular portion of the supporting-plate, the take-up plates can be vertically adjusted in order to change the time of action of the cams of said plates upon the respective threads, and the elongated slot in the shank-portion of the supporting-plate provides for an adjustment of the two take-up plates relatively to the needle-bar, so as to produce more or less of a take-up action upon each of the two threads, as will be presently understood. Each take-up plate consists of the base-portion 94 through which the holding-screws are passed, as previously described; and, on the outer edge, with the bight or incurve 95 extending vertically just above said base, and having formed, in continuity with said bight or incurve, the straight portion 96, which extends substantially parallel with what may be termed the longitudinal axis of the plate, or a line drawn centrally of the latter from end to end. Formed in continuity with the said straight portion, at its upper end, is an incurve 97 which eventuates in a straight portion 98 substantially parallel with the straight portion 96, the two straight portions thus connected by the incurve 97 producing the shoulder 99. The straight portion 98 extends to the top of the take-up plate. The inner edge of each of the plates is formed near its bottom, just above its supporting-base, with a lateral extension 100 producing a notch or shoulder 101 in combination with a straight portion 102, which extends upwardly from said extension 100 to the point 103, where the edge is incurved as at 104, and then outcurved as at 105, the outcurve extending to a degree sufficient to produce the cam-projection 106, above which the edge of the plate is extended inwardly at an inclination to the point 107 from which the edge is extended to the top of the plate in a straight line

108 in parallelism with the straight edge 98 on the outer edge of the plate.

In threading up the machine, guides 109 are provided at the rear end of the overhanging-arm through which the respective threads are led, the thread for the inner needle being indicated at *a* and the thread for the outer needle being indicated at *b*, these two threads being carried, respectively, through the tension-devices 110, then through the thread-guide 111 on the arm of the machine, then through the thread-guide 112 on the needle-lever, and thence to the inner one of the thread-guiding arms 86, and then through the elongated slots in the arm 89 and then through the apertures in the outer thread-guiding arm 86, and thence down to the needles, being separated at the needle-clamp by the screws 113. The machine thus threaded, the stitch-forming mechanism will operate substantially as follows: Assuming that the needles have descended to substantially the lowest position, as indicated in Fig. 18, and are about to retrograde or move upwardly to throw out their loops, the looper, with the two parts thereof close together as shown in Fig. 19, will move forward rapidly and pass into the loops thrown out by the needles, the beginning of this latter operation being illustrated in Figs. 20 and 21. The needles, continuing to rise, will reach substantially their upper extreme when the looper has reached substantially its forward extreme, and is about to return, with the loops prevented from running clear to the shank of the looper by the shoulder 37 of the latter, see Figs. 22 and 23. As the looper begins to move rearwardly, as shown in the latter figures, the looper proper is moved laterally on its support and away from the secondary looper, which latter, be it remembered, has but a back and forth oscillatory movement with the looper-support. The sidewise movement of the looper causes the spreading of the two loops carried by the two-part looper, and enables the looper to carry both loops of thread into engagement with the retaining-finger, as said looper moves backwardly and the needles move downwardly. In this condition, the needles will find their previously thrown out loops as they pass through the work again and descend below the same to their lowermost position; that is to say, said loops, as shown in Fig. 23, will first have been spread and then cast upon the finger of the loop-retainer, in which condition they will assume substantially the position of Fig. 30,—where a single retaining-finger is used with two needles. Hence, when the needles make their second descent, as just noted, the inner, shorter needle will pass through both loops thus held upon the hook of the retainer and, which loops are still held spread by the forward end of the

two-part looper, while the outer, longer needle will pass by the two loops. The looper, after this has occurred, by continuing its backward movement, will practically deposit the loops of needle-thread upon the inner needle, which latter passes its own thread through said loops, a subsequent loop of which is caught, together with a subsequent loop of the outer needle, by the two-part looper in its next forward movement. As the said looper moves to its rear extreme, the looper proper moves over toward the secondary looper, so as to consolidate the same and make them become practically as one, as indicated in Figs. 18 and 19, whereupon, in this form, they will again move forward, as the needles retrograde, and enter the new loops thrown out by the needles, as shown in Figs. 20 and 21, said loopers passing forward into said loops until the latter engage the shoulder 37, as before, whereupon the same manipulation of the loops will take place by the spreading of the looper and the retention of the loops upon the retaining-hooks. If two retaining-hooks are provided, as indicated in Figs. 24 to 29 and Fig. 31, said loops will be caught upon and retained by the respective retaining-hooks with the result that, when the needles descend again, as shown in Fig. 33, each needle will pass through its previously formed loop, the latter thus being held and retained by its own thread, as in the formation of an ordinary chain-stitch. The difference in the stitch produced by using one or two retaining-fingers is that, when one finger is used, the inner needle passes through both loops previously formed, thus making a cross, overseaming, or similar stitch; while, when two hooks are used on the retaining-device, the needles pass through their own previously formed loops, thus producing two parallel lines of chain-stitching, with no connecting, cross or overseaming thread between the two. Upon this part of my invention, I desire to lay great stress, since, so far as I know, no machine has ever been produced wherein two parallel, unconnected lines of stitching could be produced with a single non-thread-carrying looper without the addition of any thread-carrying part. This feature of convertibility of the machine, by the mere addition of a simple device, such as a two-hooked retainer as a substitute for a single-hooked retainer, is an important part of my invention, and upon it I desire to lay stress.

With reference to the proper stitch formation, it is essential that a take-up be employed which will properly manipulate both threads in a manner to create no more tension upon one than upon the other, and in a manner to produce two independent lines of stitching having precisely the same appearance and the stitches of which are

drawn in and set to exactly the same extent. I accomplish this feat in my machine by the use of a take-up mechanism, substantially as indicated and heretofore described in detail, the operation of which will now be set forth.

As the needle-bar descends, it carries with it the two threads *a* and *b*, one of which runs up and down the face of the take-up and the other of which runs up and down the back of the take-up. The threads being properly held under tension, no more slack can get into the stitches than is produced by the take-up cams, or conformation of the active edges of the take-up; and, since the threads extend from eye to eye in the several guiding-arms of the take-up and across the edges of said take-up, the threads will always be held, in loop form, firmly in contact with the manipulating edges of said take-up, and, especially, since, when slack is formed in the threads during the stitch formation, the looper is in possession of said slack, as will be readily understood upon reference to Figs. 20 to 23 and 26 to 29. Now, as the needle-bar descends, the slack caused by such descent is immediately taken up by the running of the threads *a*, *b* over the respective shoulders 106 and 99, which prevent any slack from forming about the point of the needles and on the looper, and, inasmuch as the outer needle is longer than the inner needle, it is essential that the slack of thread *b* of the outer needle be taken up sooner and to a lesser extent than the slack of the thread *a* of the inner needle, hence, the difference in position of the two shoulders 99 and 106. As the threads pass the respective shoulders and run down the edges of the take-up, said threads will have no strain upon them, since the movement of the arms and the needles are the same. And, when the needles reach their lowest position and are about to retrograde and need thread for the loop formation, the thread *b* will have reached the bight 95 and the thread *a* the rest or support 101, and during the period of rest in these two positions, the needles will retrograde, the loops will be thrown out, the loopers will have moved forward and drawn the loops to the fullest extent, and the spreading action of the looper will have taken place. As the needles ascend, and the threads, respectively, pass from the bight 95 and the rest 101, and on to the respective longitudinal edges of the take-up, the looper will be moving backwardly, thus giving up the loops to the same extent as the thread is being drawn in, while running over said longitudinal edges, and as the threads pass over the respective shoulders, the stitches will be set in the work; and, as the shoulder 106 on the back edge of the take-up is lower than the shoulder on the front edge thereof,

the difference in the length of the inner and outer needles is compensated for, since the said lower shoulder on the back edge of the take-up begins to set the loop of the inner needle before the loop of the outer needle is operated upon for like purpose. From the time the respective threads pass the take-up shoulders, the loops will have been set and the needles will be reaching their upper extreme, during which time there will be substantially no strain upon said threads. From this mode of operation, it will be readily understood that the respective needle-threads are, at all times, under proper control for stitch-making purposes, which stitches will be quite uniform throughout the seam.

Among the essential features and advantages of my invention, I desire to lay stress upon the following: The two threads are under perfect control at all times both above and below the work-plate so that when slack is required for needle or looper it is given or provided to the extent needed. and when the thread should be substantially taut the slack is eliminated without strain; in two-needle machines, the difference in take-up action required for the two needle-threads is provided by a single, simple take-up device, thus enabling two lines of chain-stitches to be produced having the same appearance and no difference in tension on the threads of the loops; a simple chain-stitch mechanism is provided by which either a cross, overseaming, or similar stitch can be produced, or several independent lines of stitching can be produced, the change from one to the other being secured by simply changing the form of the loop-retainer; the provision of a two-part looper renders certain the opening of the loops and the entrance of the needles therein, thus preventing the skipping of stitches and rendering the stitches absolutely uniform; the stitch-forming mechanism may comprise one or more needles, a single, two-part looper, and a retainer of single or duplex character, that is, having one or more retaining-hooks.

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

1. A stitch-forming mechanism for sewing machines having, in combination, a needle, a looper having two cooperating parts movable laterally relatively, a retainer upon which the looper deposits the loop, and means for actuating the movable elements.

2. A stitch-forming mechanism having, in combination, a plurality of needles, a two-part spreading looper cooperating with said needles, a single take-up having means for differentially acting upon the two needle-threads, and means for actuating the several elements.

3. A stitch-forming mechanism having, in combination, a needle, a looper having two cooperating parts movable laterally relatively, a retainer, means for adjusting the retainer at an angle to the looper, and means for actuating the needle and looper.

4. A stitch-forming mechanism having, in combination, a needle, a looper having two cooperating parts movable laterally relatively, a retainer, means for adjusting the retainer longitudinally of the looper, and means for actuating the needle and looper.

5. A stitch-forming mechanism having, in combination, a needle, a looper consisting of two parts having their longitudinal movements together and having relative lateral movements, a retainer, and means for actuating the needle and the two-part looper, so that the two-part looper will enter a needle-loop, spread the same and then deposit it upon the retainer.

6. A stitch-forming mechanism having, in combination, a needle, a looper-support, a looper having two cooperating loop-engaging parts one of which is journaled on the looper support and the other of which is fixed to said support, means for adjusting the parts of the looper relatively to regulate their spreading action, and means for actuating the needle and looper.

7. A stitch-forming mechanism having, in combination, a plurality of needles, a single looper cooperating with said needles, a take-up comprising a stationary device having a plurality of active edges and a movable device for operating respectively upon the needle-threads, and means for actuating the movable elements.

8. A stitch-forming mechanism having, in combination, a plurality of needles, a looper cooperating with said needles, a take-up having a plurality of active edges for operating upon the respective needle-threads, thread-guiding arms having means for separately guiding the several needle-threads so as to keep said threads in engagement with the active edges of said take-up, and means for actuating the movable elements.

9. A stitch-forming mechanism having, in combination, a needle, a looper, a take-up, and a plurality of thread-guiding arms, the take-up comprising two plates and the guiding-arms being arranged between and on opposite sides of said take-up plates, and means for actuating the movable elements.

10. A stitch-forming mechanism having, in combination, a needle, a looper, a take-up having two opposite active edges, and a plurality of thread-guiding arms for carrying the threads in engagement with said edges, the take-up being adjustable vertically so as to bring its thread-manipulating parts into proper cooperation with the said arms, and means for actuating the movable elements.

11. A stitch-forming mechanism having,

in combination, a needle, a looper, a take-up
having two opposite active edges, and
thread-engaging arms, the take-up being ad-
justable laterally so as to produce the de-
sired coöperative relation between the same
and the thread-guiding arms, and means for
actuating the movable elements.

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

JOHN P. WEIS.

Witnesses:

M. B. PATTERSON,
FRITZ BENDER.