J. R. MOFFATT AND R. S. KELSO.

SEWING MACHINE.

APPLICATION FILED FEB. 9, 1917.

1,370,985.

Patented Mar. 8, 1921.

6 SHEETS—SHEET 1.

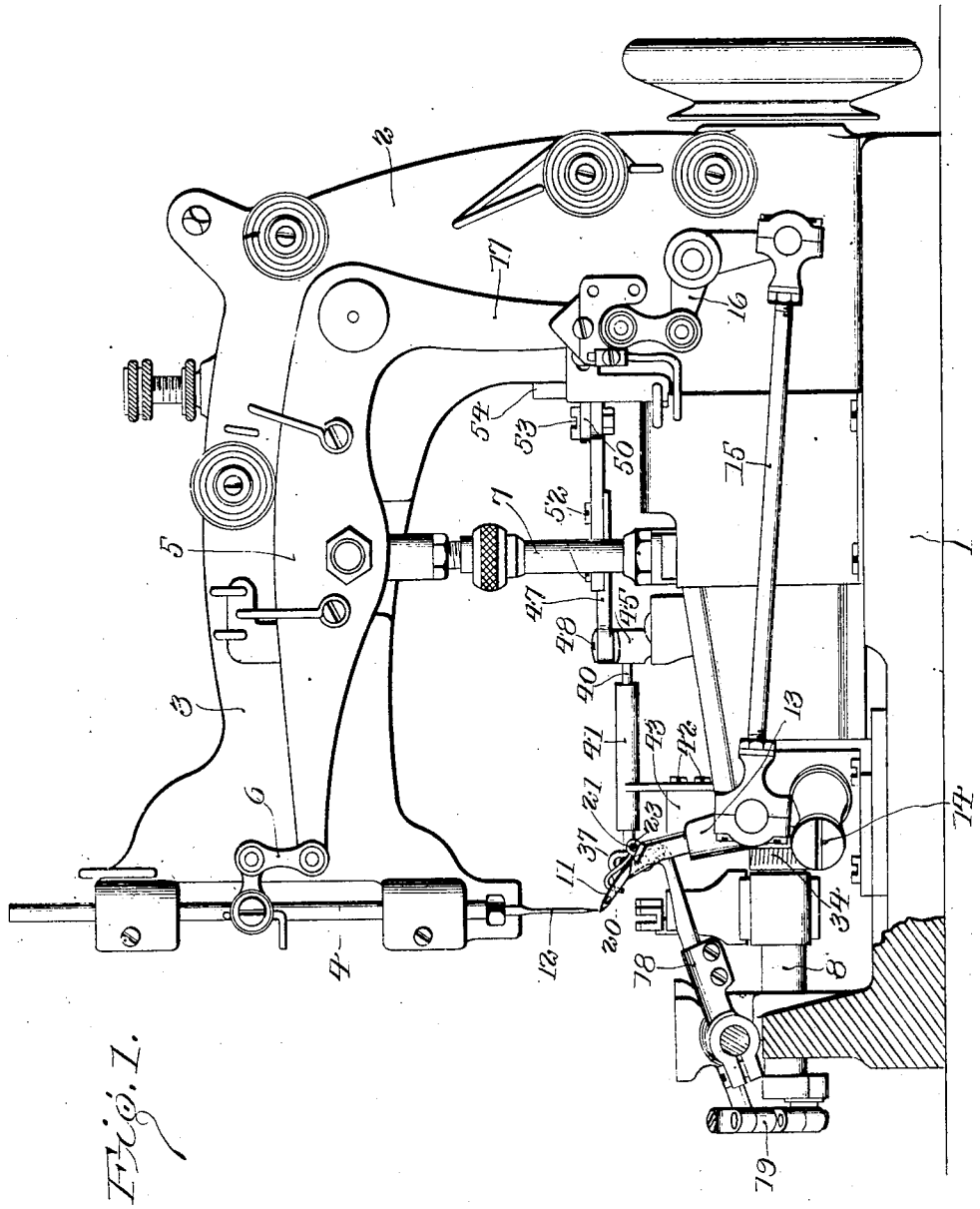


Fig. 1.

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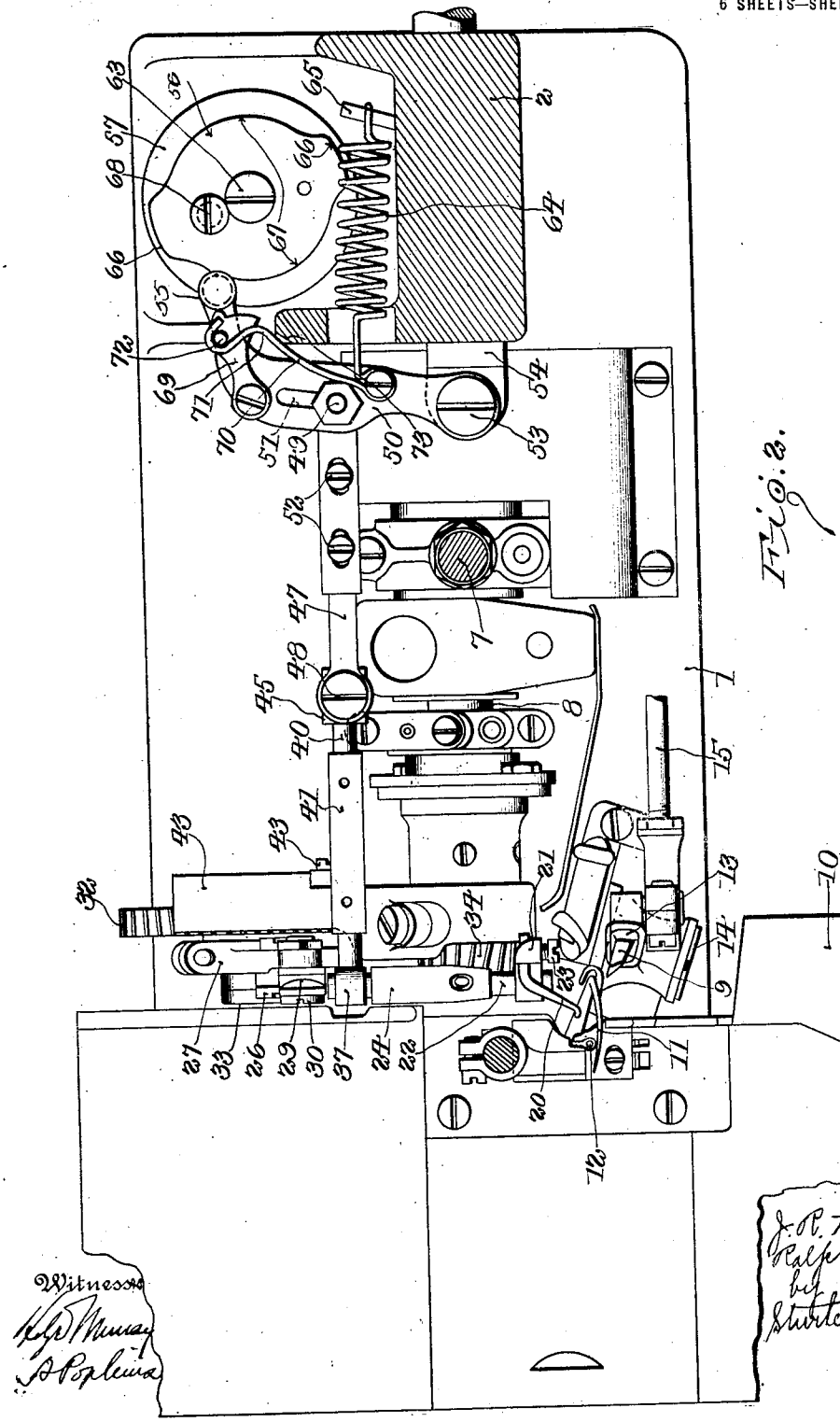


Fig. 2.

Witnesses:
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Fig. 3.

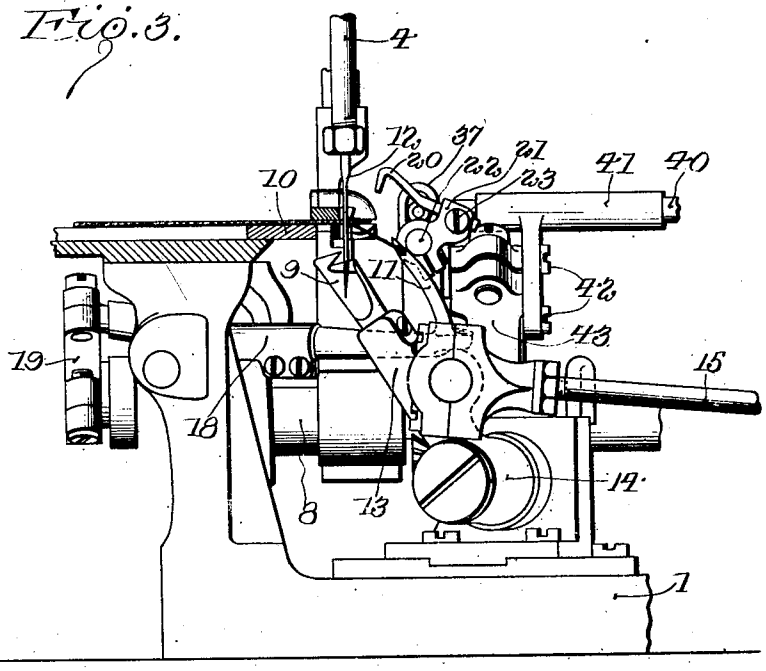
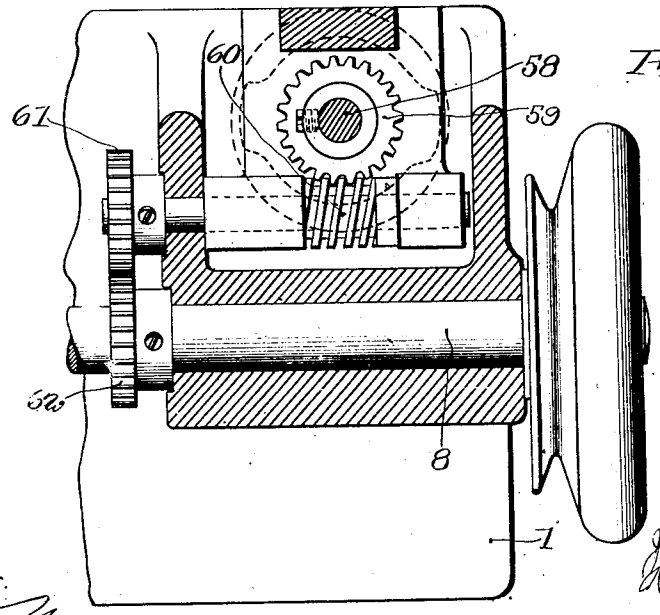


Fig. 5.



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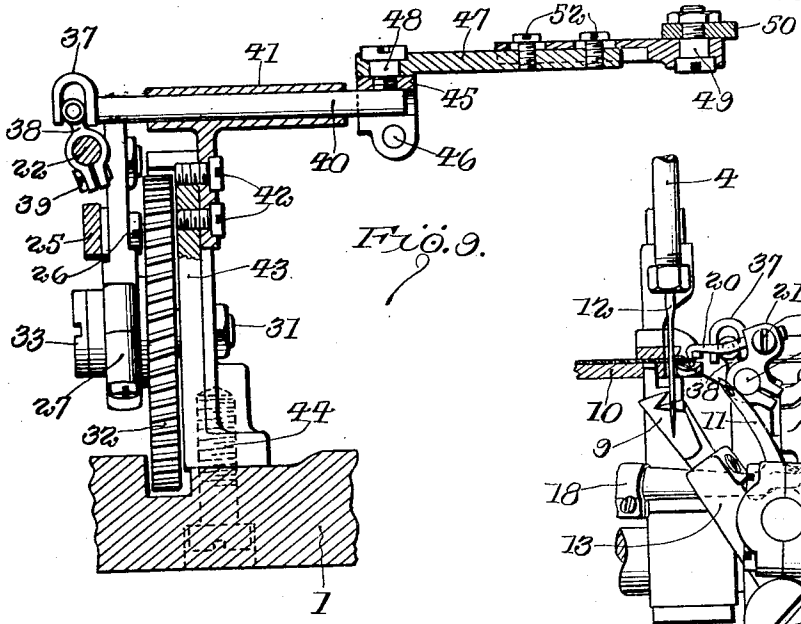


Fig. 9.

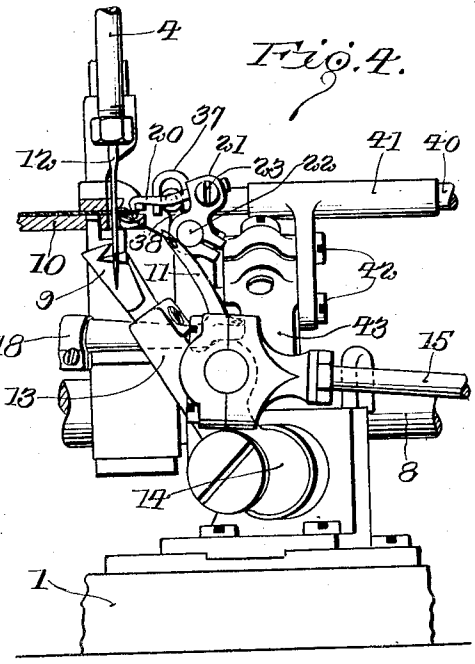


Fig. 4.

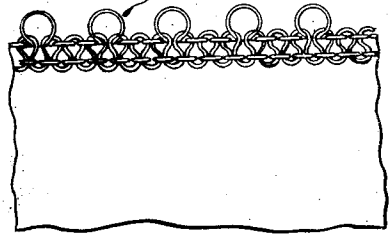


Fig. 12.

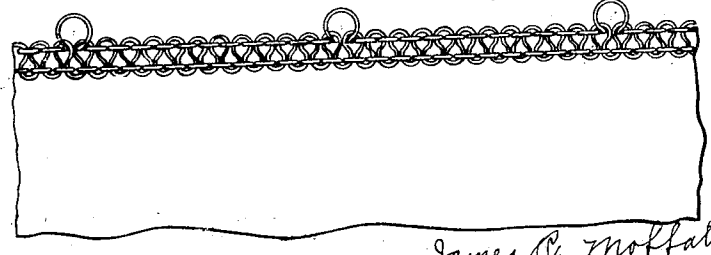


Fig. 13.

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SEWING MACHINE.

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6 SHEETS—SHEET 5.

Fig. 7.

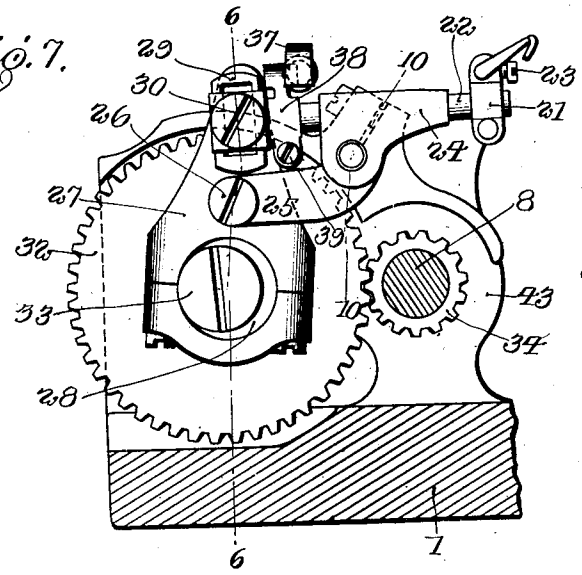


Fig. 6.

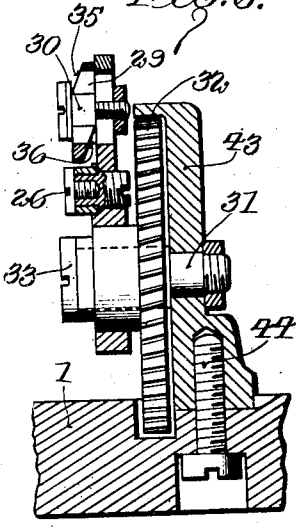


Fig. 8.

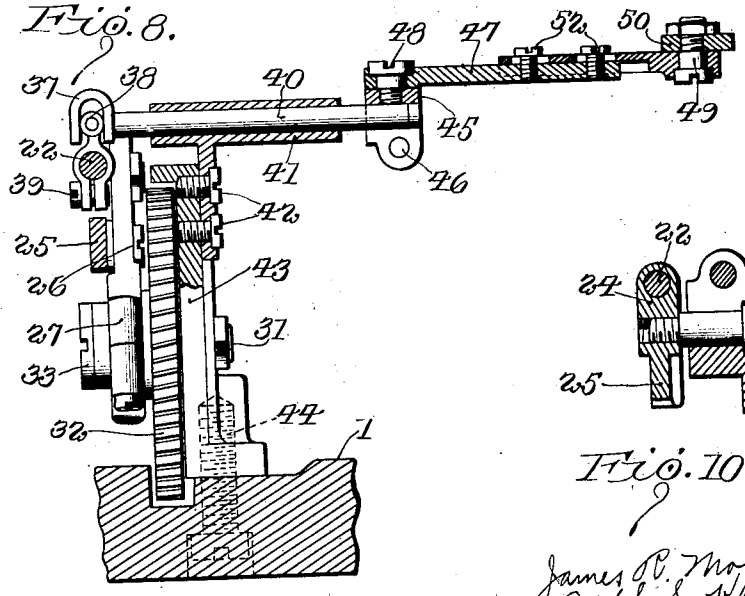


Fig. 10.

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SEWING MACHINE.

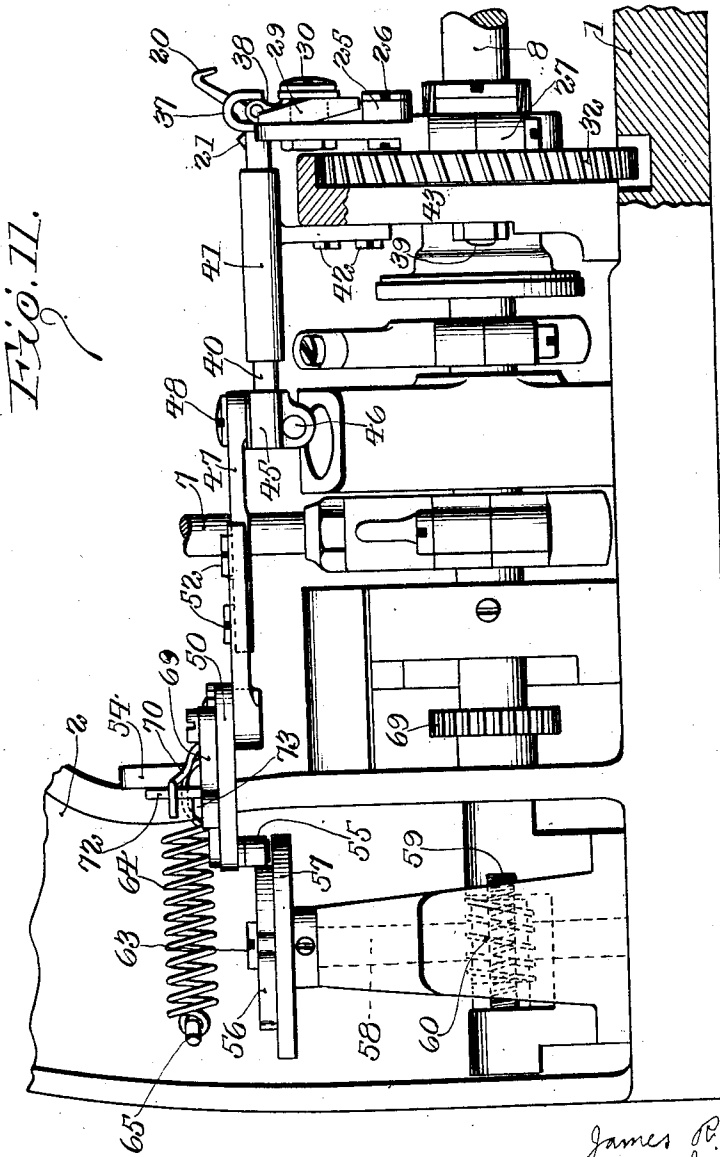
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Patented Mar. 8, 1921.

6 SHEETS—SHEET 6.

Fig. 11.



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UNITED STATES PATENT OFFICE.

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SEWING-MACHINE.

1,370,985. Specification of Letters Patent. Patented Mar. 8, 1921.

Application filed February 9, 1917. Serial No. 147,599.

To all whom it may concern:

Be it known that we, JAMES R. MOFFATT and RALPH S. KELSO, citizens of the United States, residing, respectively, at Chicago, in the county of Cook, State of Illinois, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

The invention relates to new and useful improvements in sewing machines, and more particularly to a sewing machine which is adapted to form overedge stitches.

Prior to our invention, machines of this character have been designed and devices have also been applied to the machine, which devices coöperated with the stitch-forming elements to form at certain intervals picot loops from one of the stitching threads. An object of the present invention is to provide a machine of the above character wherein the devices for forming the picot loops may be rendered effective or ineffective at the will of the operator whereby the machine may be used either for plain overedge stitching or for forming overedge stitching with picot loops.

Another object of the invention is to provide a machine of the above character with means for rendering the devices which form the picot loops ineffective at certain normal picot loop formations and effective at other picot loop formations for varying the distance between the picot loops without varying the time of the mechanism or devices which form the picot loops.

A further object of the invention is to provide a machine of the above character with a pattern cam which coöperates with the picot loop forming devices for controlling the picot loop formations.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

In the drawings, which show by way of illustration one embodiment of the invention:—

Figure 1 is a front view of a sewing machine embodying our improvements, the presser bar, the presser foot, and the work support being removed for the sake of clearness;

Fig. 2 is a view, partly in plan and partly in section, showing a portion of a sewing machine with the picot loop forming mechanism applied thereto;

Fig. 3 is a view, partly in section and partly in front elevation, showing a portion of the work support, the needle, the looper spreader coöperating with the needle, and the picot forming finger, together with means for supporting and operating said finger, the finger being in ineffective position;

Fig. 4 is a similar view, but showing the picot loop forming finger in effective position;

Fig. 5 is a view, partly in section and partly in plan, showing the means for operating the picot loop controlling cam;

Fig. 6 is a sectional view on the line 6—6 of Fig. 7;

Fig. 7 is a view, partly in section and partly in end elevation, showing the mechanism for actuating the picot forming loop;

Fig. 8 is a vertical longitudinal sectional view through a portion of the mechanism for operating the picot loop forming finger, showing the means for rendering the same effective or ineffective, and when the picot loop forming device is in ineffective position;

Fig. 9 is a similar view, but when the picot loop forming device is in effective position;

Fig. 10 is a sectional view on the line 10—10 of Fig. 7;

Fig. 11 is a view, partly in section and partly in rear elevation, showing the picot loop forming device and the controlling mechanism therefor;

Fig. 12 is a view of a section of fabric showing the picot loops formed on the machine when said picot loop forming device is effective at each picot loop forming movement;

Fig. 13 is a similar view, but showing the picot loops formed on the machine when the controlling cam shown is in action so as to render the picot loop forming device ineffective at three out of every four picot loop forming movements.

The invention is directed to a sewing machine which is provided with stitch forming elements coöperating to form overedge stitches. These stitching elements may be either all threaded elements or partly threaded so as to form overedge stitches from one, two, three threads or more. Coöperating with this overedge stitch forming mecha-

nism is a picot loop forming finger which is adapted at certain times to engage one of the stitching threads and hold or form a loop therein which projects from the normal overedge stitches, thus forming the well-known picot loop. This picot loop forming device may be timed so as to form a picot loop at any desired stitch intervals. The present machine is designed to form a picot loop at every third stitch.

Coöperating with this picot loop forming mechanism is means for rendering the picot loop forming finger effective or ineffective at the will of the operator, and this permits the machine to be readily adapted for forming either plain overedge stitches or overedge stitches with projecting picot loops in accordance with the character of the work desired. The controlling means for the picot loop forming finger may also be placed under the control of a pattern cam which will render the picot loop forming device ineffective at certain of the picot loop forming movements and effective at others. In the present embodiment, the controlling cam causes this picot loop forming finger to be ineffective at three consecutive picot loop forming movements and effective at the fourth picot loop forming movement, and so on, thus spacing the picot loops twelve stitches. This spacing can be readily varied by varying the pattern cam so as to space the picot loops at any desired distance which, of course, in the present embodiment of the invention must be a multiple of three stitches. A latch is also provided for rendering the picot loop forming device ineffective so, as above noted, the machine may be operated solely for forming normal overedge stitches.

Referring more in detail to the drawings:—

We have shown our invention applied to a sewing machine having the usual bed plate 1, a standard 2, carrying an overhanging arm 3, in which a needle bar 4 reciprocates. The needle is reciprocated by a needle lever 5 which is connected to the needle bar by a link 6. The needle lever is oscillated by a pitman 7 which coöperates with an eccentric on the main shaft 8.

Coöperating with the needle beneath the work support is a thread implement 9 which is in the form of a spreader adapted to engage the needle thread loop and carry the same to the edge of the work support 10 where the needle loop is entered by a looper 11. The looper is threaded and moves to a point above the work support where its loop is positioned for the entrance of the needle 12 carried by the needle bar 4. The spreader 9 is carried by a support 13 which is pivoted at 14, and said spreader support is oscillated by a link 15 connected to a rock lever 16 which in turn is connected to the needle lever extension 17. The looper 11 is carried by a support 18, and this support is rocked by a link 19 connected to a crank at the end of the main shaft 8. This overedge stitch forming mechanism is of the usual character and forms no part of the present invention *per se*.

It will be readily understood that in place of the spreader 9, a threaded looper may be used, or in place of the looper 11 a second spreader may be used, or in place of the spreader 9 and looper 11 a single thread manipulating implement may be used. The essential feature consists in forming stitches which are carried about the edge of the fabric and known as overedge stitches.

Coöperating with this overedge stitch-forming mechanism is a picot loop forming device which consists of a finger 20 clamped in a supporting collar 21 which in turn is clamped to a rod 22. This finger 20 is held in the supporting collar 21 by a set-screw 23 which permits the finger to be adjusted in the supporting collar. The rod 22 is mounted in a pivoted sleeve 24. This sleeve is pivoted to swing about an axis which lies in a plane at right angles to the longitudinal axis of the rod 22. The sleeve 24 has an arm 25 which is pivoted at 26 to an eccentric strap 27 which coöperates with an eccentric 28. The rod 22 carries a cross head 29. This cross head has a sliding engagement with a bolt 30 which is adjustably secured to the eccentric strap 27. The eccentric 28 is mounted to rotate on a supporting stud 31. A gear 32 is fixed to the eccentric by means of a screw 33, and this gear 32 meshes with a gear 34 on the main shaft 8. The gears 32 and 34 are so proportioned that the gear 32 will be rotated once for every three rotations of the shaft 8. As the eccentric 28 rotates, it will cause the rod 22 carrying the loop forming finger 20 to move endwise in the sleeve 24 and also cause the sleeve 24 to oscillate in a vertical plane. This gives more or less of an elliptical movement to the end of the finger 20.

When the parts are positioned as shown in Figs. 4 and 9, the picot loop forming finger 20 engages one of the stitching threads and holds the thread in loop formation, which loop is of sufficient dimensions so that, when the overedge stitching threads are drawn down, this loop projects beyond the edge of the stitching threads. This operation of the picot loop forming finger is not new with us and forms no part of the present invention *per se*. With the gears formed as described above, this picot loop forming finger will form a picot loop at every third stitch, as the stitching elements operate to form a stitch at each rotation of the main shaft, and the eccentric controlling the picot loop forming finger rotates once for every three rotations of the main shaft.

The present invention is directed particularly to the means for rendering this picot loop forming finger effective or ineffective at will or automatically through the control of a patterning mechanism.

The rod 22 is capable of a limited oscillation about its longitudinal axis in the sleeve 24. The cross head 29 is cut-away at 35 and 36 to permit this rod to have a limited oscillation. The rod is oscillated by means of a controlling bracket 37 in which an arm 38 freely moves in a vertical plane. This arm 38 is clamped to the rod 22 by means of a screw 39. The bracket 37 is carried by a rod 40 which slides in a sleeve 41 clamped by screws 42 to a standard 43 which also carries the supporting stud 31. This standard is secured to the bed of the machine by a screw 44 (see Fig. 6). At the end of the rod 40 there is a collar 45 which is clamped to the rod by means of a clamping screw 46. A link 47 engages a pivot screw 48 carried by this collar 45. This link at its other end is pivoted to a bolt 49 which is adjustably connected to the lever 50. Said lever is formed with a slot 51 along which the bolt may be adjusted. The link 47 is made in two sections, one of which is slotted and joined to the other by means of screws 52. This enables the length of the link to be adjusted. The lever 50 is fulcrumed at 53 on a lug 54 attached to the standard 2 of the machine. The lever 50 carries a roller 55 which is adapted to coöperate with a pattern cam 56 fixed to a disk 57 carried by a vertical shaft 58. This vertical shaft is provided with a gear 59 which meshes with a worm gear 60 on a countershaft. The countershaft carries a small gear 61 which meshes with a gear 62 on the main shaft 8.

The pattern cam 56 is secured to the disk 57 by a clamping screw 63 which permits the pattern cam to be readily removed, and another cam to be substituted therefor. A spring 64 is secured at one end to the lever 50 and at its other end to a lug 65, and this spring normally presses the roller 55 in a direction toward the periphery of the pattern cam 56. This pattern cam has four separate concentric surfaces. The concentric surfaces 66 are opposed and are of greater radius than the concentric surfaces 67 which are likewise opposed. When the roller 55 is on the concentric portion 67, then the parts are in the position shown in all of the figures of the drawings, except Figs. 4 and 9. This positions the picot loop forming finger so that in its elliptical path of travel it will not engage the stitching threads. In other words, it is ineffective although it goes through its same cycle of movements as when it is effective.

When this roller 55 engages the concentric portion 66 of the pattern cam, then the link 47 will move the rod 40 endwise to the position shown in Figs. 4 and 9. This rocks the rod 22 so as to lower the path of travel of the picot loop forming finger 20 and brings it to a position where it will engage one of the stitching threads and form a picot loop. The shaft carrying the pattern cam is timed so that it makes one rotation to every twenty-four rotations of the main shaft. As a result, while the roller 55 is on the section 66, the picot loop forming finger will be in effective position and sufficient time to form one picot loop. As a matter of fact, the roller 55 will be on this section substantially throughout the forming of three stitches or three rotations of the main shaft and during this time one picot loop will be formed.

While the concentric portion 67 is in engagement with the roller 55, the main shaft will make nine rotations and the picot loop forming finger will be operated three times, but each of these operations will be ineffective as the picot loop forming finger is out of range of the stitching threads. The concentric portion 66 at the opposite side then operates upon the roller 55 to form another picot loop, and in this way three of the operations of the picot loop forming finger will be ineffective, which is followed by one effective operation of the picot loop forming finger and so on, thus forming a picot loop at every twelfth stitch. It will be obvious that the cam 56 may be changed so as to vary the spacing of the picot loops, but so long as the picot loop forming mechanism operates at every third stitch, these variations will necessarily be multiples of three stitches.

Mounted on the lever 50 is a latch 69. The wire forming the spring 64 is bent to form a yielding holding finger 70 which coöperates with this latch. Said finger has a shoulder 71 formed therein, and the latch carries a pin 72. When the latch is positioned as shown in Fig. 2, the yielding finger 70 will hold it in this position, but it will be readily seen that the latch may be turned in a clockwise direction to carry the pin 72 over the shoulder 71, and then the end of the latch will engage the face 73 on the standard, and when in this position the picot loop forming finger will be positioned for making picot loops. In other words, when the latch 69 is in engagement with the face 73 on the standard the link 47 will assume the same position as though the roller 55 engaged the face 66 of the cam 56 and thus position the picot loop forming finger so that it will engage the stitching threads at each operation thereof and form a picot loop. When it is desired to use the machine without forming picot loops, the cam 56 may be removed and the spring 64 will hold the picot loop forming finger raised from operative engagement with the stitching

threads. Thus, it will be apparent that the machine may be readily converted at the will of the operator from a normal overedge forming machine to a picot loop forming machine. It will also be obvious that a pattern control mechanism may be used for spacing the picot loops in accordance with the control pattern cam.

While we have described the picot loops as actually formed from the stitching threads, it will be obvious that from certain aspects of the invention the picot loops may be formed from a thread laid in and concatenated with the stitching threads. The essential features so far as this invention is concerned consist in the means for making the picot loops regardless as to how they are made, and the rendering of that means ineffective at certain intervals or continuously for the purpose stated.

It is obvious that minor changes in the details of construction and the arrangement of parts may be made when desired without departing from the spirit of this invention as defined in the appended claims.

Having thus described the invention, what is claimed as new is:—

1. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger adapted to engage one of the stitching threads for holding the same to form a picot loop, means for operating said picot loop forming finger and means for varying the relative position of said picot loop forming finger and the overedge stitch forming mechanism whereby said finger may be rendered effective or ineffective.

2. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger adapted to engage one of the stitching threads for holding the same to form a picot loop, means for actuating said picot loop forming finger and means for automatically varying the actuating position of said picot loop forming finger whereby the same is rendered effective or ineffective at certain intervals.

3. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger adapted to engage one of the stitching threads for holding the same to form a picot loop, means for operating said picot loop forming finger and devices including a pattern cam for shifting the relative position of said picot loop forming finger and the overedge stitch forming mechanism whereby said finger may be rendered effective or ineffective in accordance with the shape of the pattern cam.

4. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger adapted to engage one of the stitching threads for holding the same to form a picot loop, means for operating said picot loop forming finger, a spring operated device for normally holding said picot loop forming finger in ineffective position and means for shifting said device against the action of the spring to render the picot loop forming finger effective.

5. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger adapted to engage one of the stitching threads for holding the same to form a picot loop, means for operating said picot loop forming finger, a spring operated device for normally holding said picot loop forming finger in ineffective position and means for shifting said device against the action of the spring to render the picot loop forming finger effective, said last named means including a pattern cam.

6. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger adapted to engage one of the stitching threads for holding the same to form a picot loop, means for operating said picot loop forming finger, a spring operated device for normally holding said picot loop forming finger in ineffective position and means for shifting said device against the action of the spring to render the picot loop forming finger effective, said last mentioned means including a latch for holding said device against the action of the spring for causing said picot loop forming finger to form picot loops at each operation thereof.

7. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger adapted to engage one of the stitching threads for holding the same to form a picot loop, means for operating said picot loop forming finger, spring actuated devices for shifting the operative position of said picot loop forming finger whereby the same is rendered ineffective and a detachable pattern cam for moving said devices against the action of the spring for rendering said picot loop forming finger effective.

8. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger, a rod on which said finger is mounted, a sleeve in which said rod is mounted, means coöperating with said sleeve and said rod for moving said picot loop forming finger whereby the same is adapted to engage one of the stitching threads and hold the same to form picot loops, means for oscillating the rod in said sleeve for varying the operating position of the picot loop forming finger to render the same effective or ineffective.

9. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger, a rod on which said finger is mounted, a sleeve in

which said rod is mounted, means coöperating with said sleeve and said rod for moving said picot loop forming finger whereby the same is adapted to engage one of the stitching threads and hold the same to form picot loops, means for oscillating the rod in said sleeve for varying the operating position of the picot loop forming finger to render the same effective or ineffective, said last named means including a pattern cam whereby the picot loop forming finger is rendered effective at certain intervals only.

10. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger, a rod on which said finger is mounted, a sleeve in which said rod is mounted, means coöperating with said sleeve and said rod for moving said picot loop forming finger whereby the same is adapted to engage one of the stitching threads and hold the same to form picot loops, means for oscillating the rod in said sleeve for varying the operating position of the picot loop forming finger to render the same effective or ineffective, said last named means including a spring for normally shifting the rod to render the picot loop forming finger ineffective and devices for moving the rod against the action of the spring for rendering it effective at certain intervals.

11. A sewing machine including in combination an overedge stitch forming mechanism, a picot loop forming finger, a rod on which said finger is mounted, a sleeve in which said rod is mounted, means coöperating with said sleeve and said rod for moving said picot loop forming finger whereby the same is adapted to engage one of the stitching threads and hold the same to form picot loops, means for oscillating the rod in said sleeve for varying the operating position of the picot loop forming finger to render the same effective or ineffective, said last named means including a spring normally shifting said rod to render the picot loop forming finger ineffective and a latch controlled at will for shifting said devices against the action of the spring for rendering the picot loop forming finger continuously effective.

In testimony whereof, we affix our signatures in the presence of two witnesses.

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RALPH S. KELSO.

Witnesses:
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STEDMAN THOMAS.