

J. BERGER.
 THREAD CONTROLLER FOR SEWING MACHINES.
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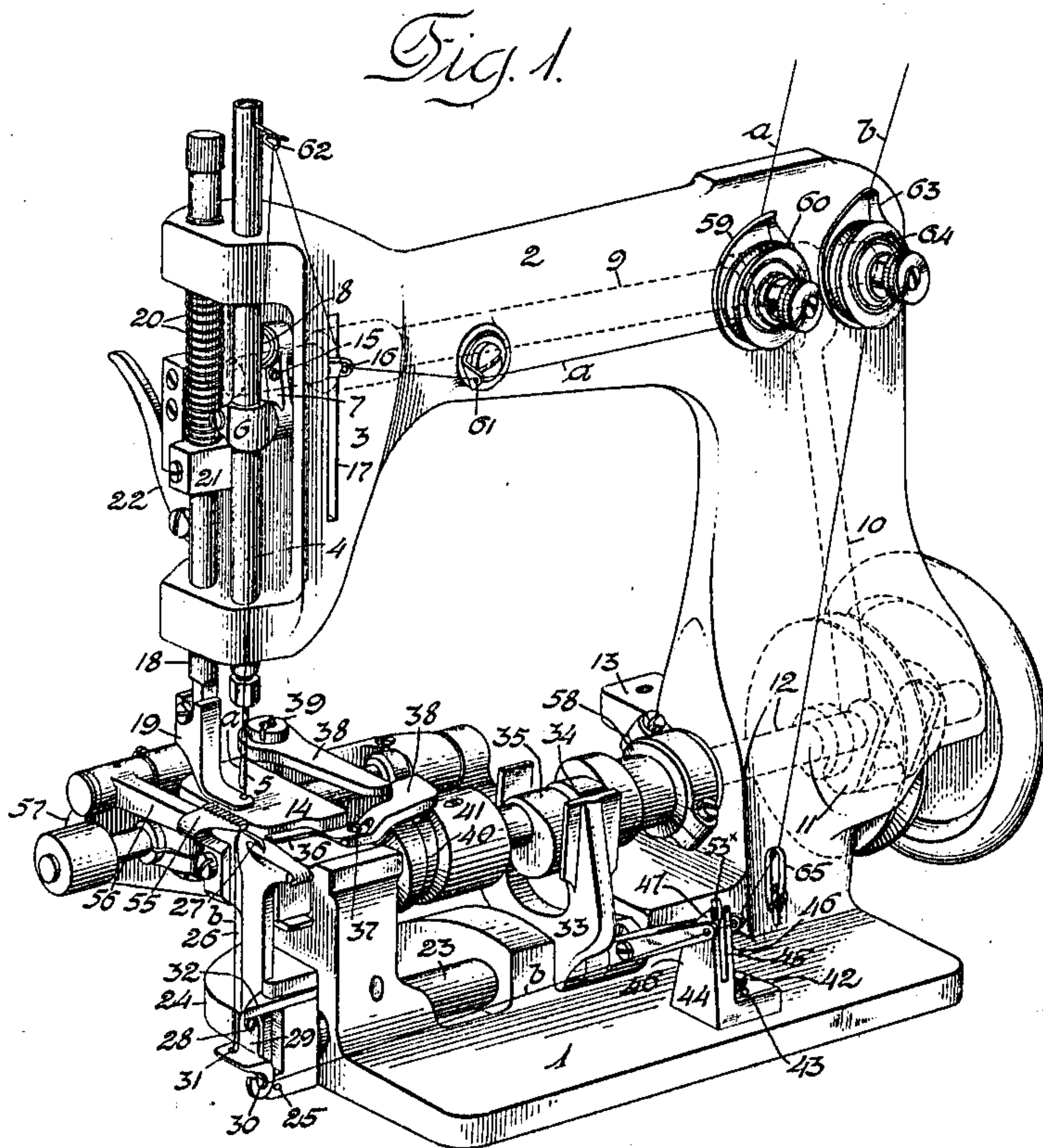


Fig. 2.

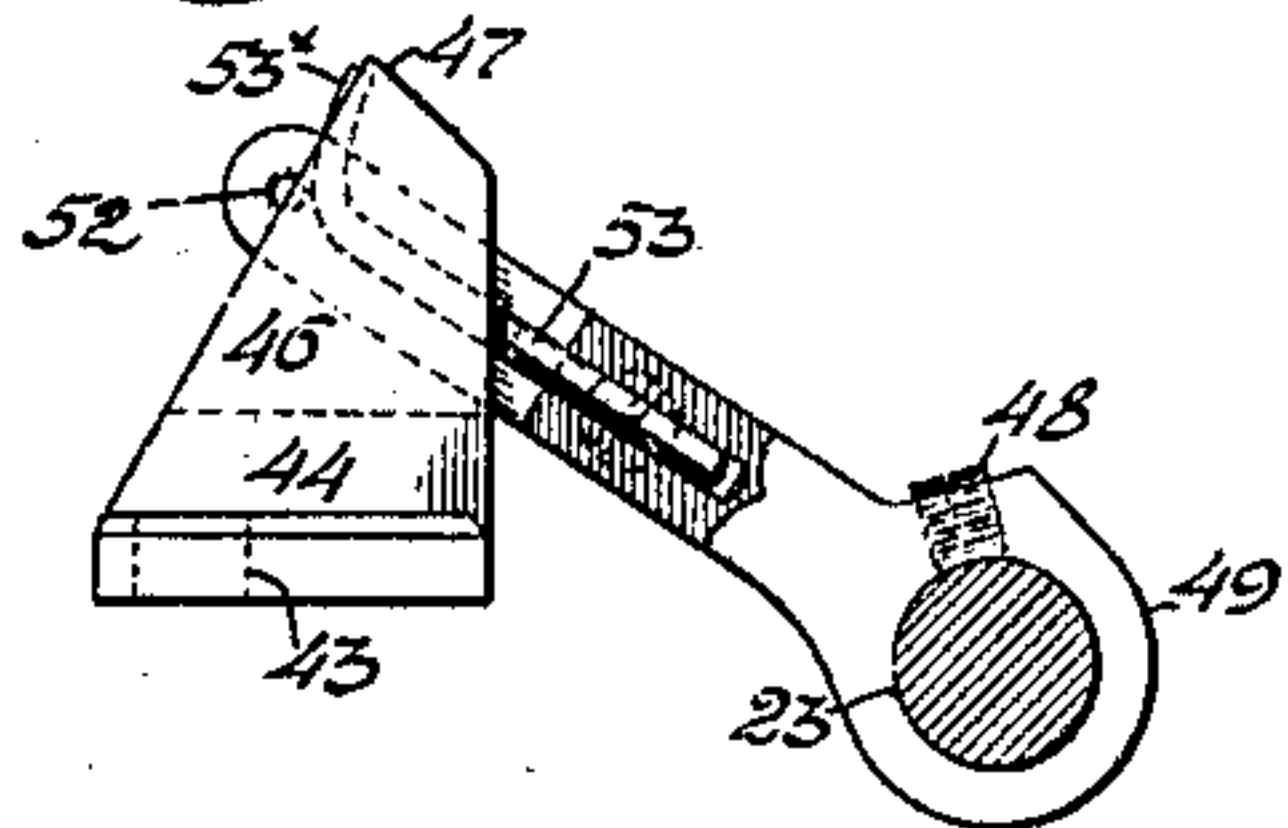


Fig. 3.

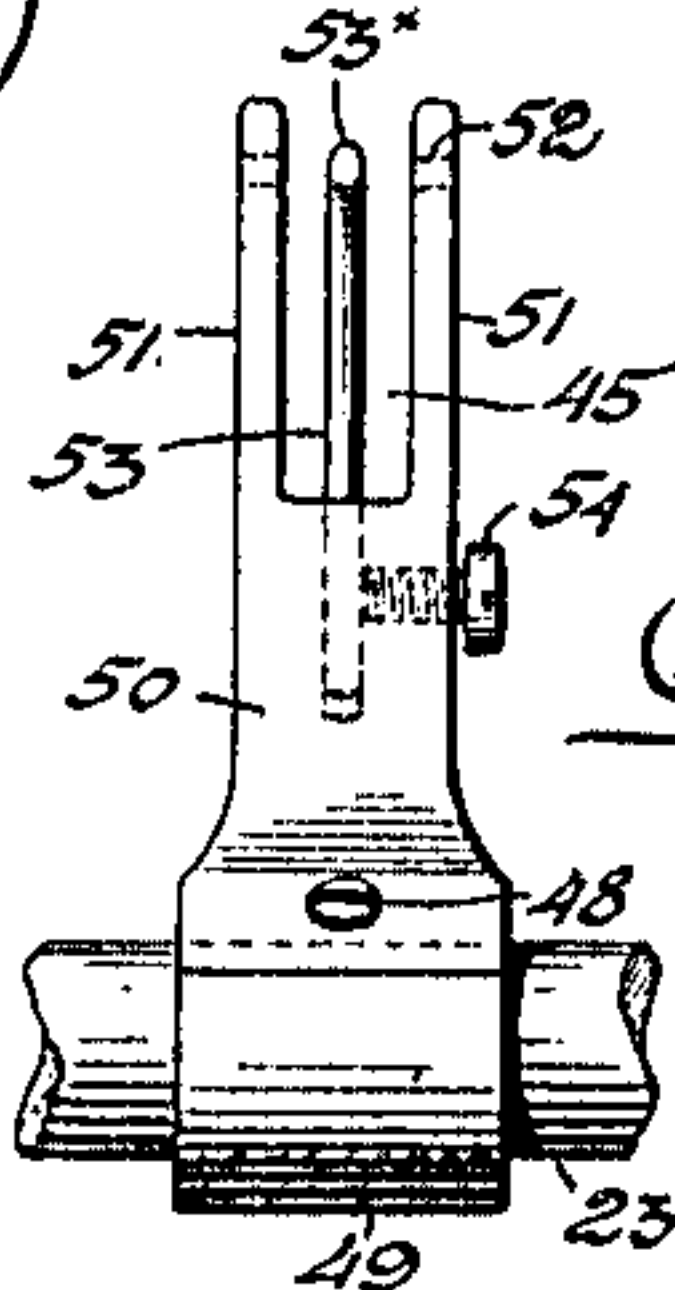
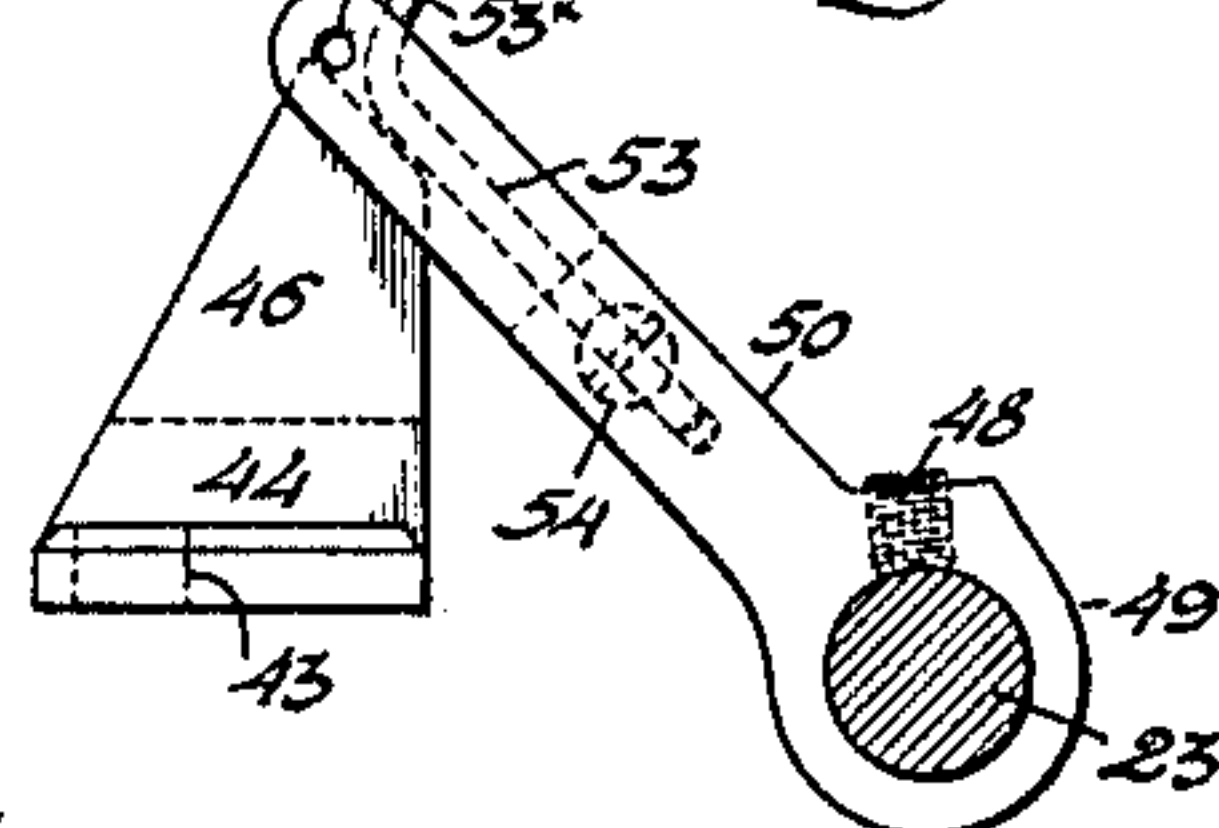


Fig. 4.

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THREAD-CONTROLLER FOR SEWING-MACHINES.

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To all whom it may concern:

Be it known that I, JOSEPH BERGER, a citizen of the United States, residing at Bayonne, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Thread-Controllers for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to an improvement in chain-stitch sewing machines, and it has for its object to provide a controlling device for the lower thread which shall be simple in construction and shall have a uniform action upon the thread. In one of its forms, as embodied in a machine having a thread carrying looper fixed upon a supporting rock-shaft journaled in stationary bearings in the machine frame, 15 a forked vibrating arm is fixed upon the looper rock-shaft and provided with aligned thread-eyes adapted to embrace a bracket secured upon the machine frame and provided with a thread-detaining shoulder. In its passage to the looper from the source of supply, the thread is led through the eyes of said vibratory arm and is caught in the movement of the latter upon the stationary 25 detaining shoulder whereby the slack between the looper and the tension is drawn up, and a supply of under thread is drawn through the tension for the succeeding stitch, the thread being forcibly disengaged from the detaining shoulder by a cast-off finger carried by and adjustably secured to the said vibratory arm. Adjustments are provided for varying the thread-drawing action of the vibratory arm and the thread-releasing action of the cast-off finger.

40 In the accompanying drawings, Figure 1 is a perspective view of a sewing machine embodying the present invention, with the face-plate of the bracket-arm and the work-plate removed. Figs. 2 and 3 are sectional side elevations showing the vibratory thread-drawing arm in two extreme positions, and Fig. 4 an edge view of the vibratory thread-drawing arm.

In its general constructive features, the machine in which the present improvement is embodied is similar to that represented in the United States Patent No. 924,903, of June 15, 1909. It is constructed with a frame comprising the base-plate 1 and 55 overhanging bracket-arm 2 in the head 3

of which is mounted the vertically reciprocating needle-bar 4 carrying an eye-pointed needle 5 and provided intermediate its bearings with the fixed collar 6 connected by means of the pitman 7 with a crank-pin 8 60 carried upon the forward end of the needle-actuating rock-shaft 9 journaled in the bracket-arm and having at its rearward end a crank-arm connected by means of the pitman 10 with the crank 11 in the rearward end of the main-shaft 12 journaled 65 in suitable bearings in the base 1 beneath the work-plate which is in practice supported upon the seats 13 and 14 provided therefor upon the base 1. Rigidly secured 70 to the pitman 7 by means of the fastening screw 15 is a laterally extending take-up arm 16 having at its outer end the usual thread-eye and working in a vertical slot 17 in the front side of the head 3 of the 75 bracket-arm. Journaled also in the head 3 is the usual presser-bar 18 carrying the presser-foot 19 and normally depressed by means of the spring 20 interposed between the upper bearing and the thrust-block 21 80 adapted for engagement by the lifting lever 22.

Beneath the main-shaft 12 and parallel therewith is journaled the looper-supporting rock-shaft 23 provided at its outer end with 85 a block 24 in which is pivotally mounted by means of the pin 25 the shank 26 of the looper whose blade 27 is provided with the usual thread-eyes in the point and heel and intermediate groove or channel for the lower 90 thread. To the looper shank is secured by means of the screw 28 the foot 29 of a thread-guide formed with open eyes 30 and 31 to receive the thread passing from the source of supply to the looper-blade. The 95 looper-shank is normally engaged by the spring-pressed hook 32 for holding it in normal operative position relative to its carrying block 24.

Upon the rearward portion of the looper-supporting shaft is fixed the upwardly extending yoke 33 embracing the two-part actuating cam formed with operative sections 34 and 35. 100

To distend the looper-thread between the 105 eye in the looper point and the under side of the material for passage of the needle, a spreading finger 36 is secured by means of a screw 37 upon the forward end of an angular lever 38 fulcrumed upon the frame 110

of the machine by means of a screw 39 and provided intermediate the fulcrum and the spreader-finger with a roller-stud entering the cam-groove 40 in the cam-cylinder 41 fixed upon the main-shaft.

Secured adjustably upon the base 1 at the front side of the machine by means of a screw 42 entering a transverse slot 43 in its foot, is a bracket 44 having its upper portion divided by a vertical slot 45 to produce two spaced parallel wings 46 each of which is formed at its upper extremity with an angular thread-detaining shoulder 47.

Fixed for circular adjustment upon the rearward portion of the looper rock-shaft 23 by means of a set-screw 48 is the hub 49 of a vibratory thread-controller arm 50 which is forked at its outer end to provide two spaced thread-guiding members 51 adapted to embrace the upwardly extending wings 46 having the thread-detaining shoulders. The members 51 of the thread-controlling lever are provided with alined thread-guiding eyes 52 which in practice bear such relation to the stationary wings 46 that in the lower position of the arm 50 represented in Fig. 2 the eyes 52 are in substantial alinement with the inclined forward edges of such wings; while in the upper position of the thread-controlling arm, as represented in Fig. 3, the thread-eyes 52 are above and slightly rearward of the angular upper extremities of the wings 46, the inclined rearward edges of these wings affording thread-detaining shoulders upon which the thread catches in the movement of the arm 50 from upper to lower position.

Intermediate the spaced members 51 of the arm 50 is disposed the cast-off finger 53 adjustably secured by means of the set-screw 54 within a radial socket in such arm and having its upturned operative outer extremity 53* arranged slightly rearward of the thread-eyes 52 and at an inclination to the circular arc of movement of the thread-eyes 52. The finger 53 is so arranged that in the vibratory movements of the controller-arm 50 it enters the slot 45 between the wings 46, and it is so adjusted radially of the shaft 23 that it engages the thread detained by the stationary shoulder 47 after the thread-eyes 52 have descended below the same and it positively pushes the thread off the detaining shoulder precisely at the time that the arm 50 has descended sufficiently to draw up the desired amount of thread.

The feed-dog 55 is carried by the feed-bar 56 pivotally connected with an upwardly projecting arm 57 of the feed-rocker actuated by a connection with the feed-actuating eccentric 58 upon the rearward portion of the main-shaft and the usual feed-lifting means are provided upon the forward end of the main-shaft.

In threading the machine, the upper thread *a* is led through the usual guide-eye in the washer 59 and thence between the tension disks 60 through the adjustable guide-eye 61 upon the bracket-arm, from which it is led through the eye of the take-up arm 16 and the guide-eye 62 upon the needle-bar downwardly to the eye of the needle 5. The looper-thread *b* is led from the source of supply through the guide-eye of the washer 63 between the tension-disks 64 downwardly to the guide-loop 65 near the base of the bracket-arm, from which it passes successively through the eyes 52 of the spaced members 51 of the controller-arm, and thence through the guide-eyes 30 and 31 at the lower end of the looper-shank to the looper-blade 27.

In the operation of the machine, the needle descends, and in rising presents the loop of its thread for seizure by the looper, which advances in a direction transverse to its supporting rock-shaft 23 into such loop, and in doing so progressively reduces the distance between its point and the needle-hole in the usual throat-plate and the under side of the fabric to which latter the end of the looper-thread is attached after production of the first stitch. To prevent the imperfect co-operation of the looper and needle at this point and resultant skipping of stitches, the descent of the thread-controller arm 50 simultaneously with the advance of the looper causes the deflection of the thread between the guide-eyes 52 by engagement with the detaining shoulder 47 and thus takes up the slack looper-thread which would otherwise be formed above the looper-point, and hence no loose looper-thread is left around the looper-point to interfere with the needle-thread loop presented for seizure. In practice, the disengagement of the looper-thread from the loop-detaining shoulders is not effected at the point when the drawing taut of the slack is completed but takes place slightly thereafter so that the continued downward movement of the arm 50 serves to draw off a supply of looper-threads for the succeeding stitch. As the inclined forward edges of the wings 46 are substantially tangential with the circular path of movement of the eyed outer ends of the members 51, the action of these wings upon the looper-thread in the upward movement of the arm 50 during the retraction of the looper is almost inappreciable, and any slack of the looper-thread at this time is disposed of by the advance of the work through the action of the feeding mechanism.

As will be readily seen, the extent of take-up and pull-off actions of the controller-arm 50 is determined by the adjustment of the latter upon the looper rock-shaft, the range of movement being adapted for such slight adjustment as may be found desirable; while

the timing of the release of the thread from the detaining shoulders may be varied within the necessary limits by the radial adjustment of the cast-off finger 53 within its socket in the arm 50.

While the upright bracket-plate 44 is shown and described herein forked to receive the cast-off pin 53 53* and the controller-arm 50 is similarly forked to embrace the stationary bracket-plate 44, it is evident that this construction and arrangement of the cooperating parts may be readily modified in form without materially affecting their cooperation in the handling of the looper-thread, and the present invention is not to be understood therefore as limited to the particular embodiment herein shown and described.

Having thus set forth the nature of the invention, what I claim herein is:—

1. In a sewing machine, the combination with a reciprocating needle, a cooperating lower-thread looper, and an actuating rock-shaft therefor, of a stationary thread-detaining shoulder, a vibratory thread-guiding arm fixed upon said rock-shaft and having its thread-engaging portion movable in a path adjacent and transverse to said shoulder, and a cast-off member also carried by said arm and adapted to dislodge from said shoulder the thread deposited thereon by said thread-guiding arm.

2. In a sewing machine, the combination with a reciprocating needle, a cooperating lower-thread looper, and an actuating rock-shaft therefor, of a stationary thread-detaining shoulder forked transversely to its thread-engaging portion, a vibratory thread-guiding arm fixed upon said rock-shaft and forked to embrace said thread-detaining shoulder and provided with thread-guiding eyes movable from one to the other side of said shoulder, and a cast-off member also carried by said arm and adapted to enter the fork of said thread-detaining shoulder to dislodge from the same the thread deposited thereon by said thread-guiding arm.

3. In a sewing machine, the combination with a reciprocating needle, and a cooperating lower-thread looper, of a stationary thread-detaining shoulder, a reciprocatory thread-guide forked to embrace said shoulder

and formed with thread-guiding eyes, means for actuating said thread-guide to move its thread-eyes from one to the other side of said shoulder, a cast-off finger movable with the thread-guide and adapted to positively disengage from said shoulder thread deposited thereon by the thread-guide, and means for securing said finger upon the thread-guide adjustably transversely of the direction of movement of said thread-guide.

4. In a sewing machine, the combination with a reciprocating needle, a cooperating lower-thread looper, and a supporting rock-shaft upon which said looper is fixed to perform its operative movements in a direction transverse to said shaft, of a stationary thread-detaining shoulder, a vibratory arm fixed upon the looper-supporting rock-shaft and forked to embrace said thread-detaining shoulder and provided in the outer end with alined thread-eyes, and a cast-off finger carried by and supported within the fork of said vibratory arm and having its operative portion arranged out of alinement with said thread-eyes.

5. In a sewing machine, the combination with a reciprocating needle, a cooperating lower-thread looper, and a supporting rock-shaft upon which said looper is fixed to perform its operative movements in a direction transverse to said shaft, of a stationary thread-detaining shoulder, a vibratory arm secured for circular adjustment upon the looper-supporting rock-shaft and forked to embrace said thread-detaining shoulder and provided in the outer end with alined thread-eyes, and a cast-off finger secured within the fork of said vibratory arm and adapted for adjustment toward and from said rock-shaft and having its outer operative portion at an inclination to the circular path of movement of the eyed outer portion of said vibratory arm.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

JOSEPH BERGER.

Witnesses:

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HENRY J. MILLER.