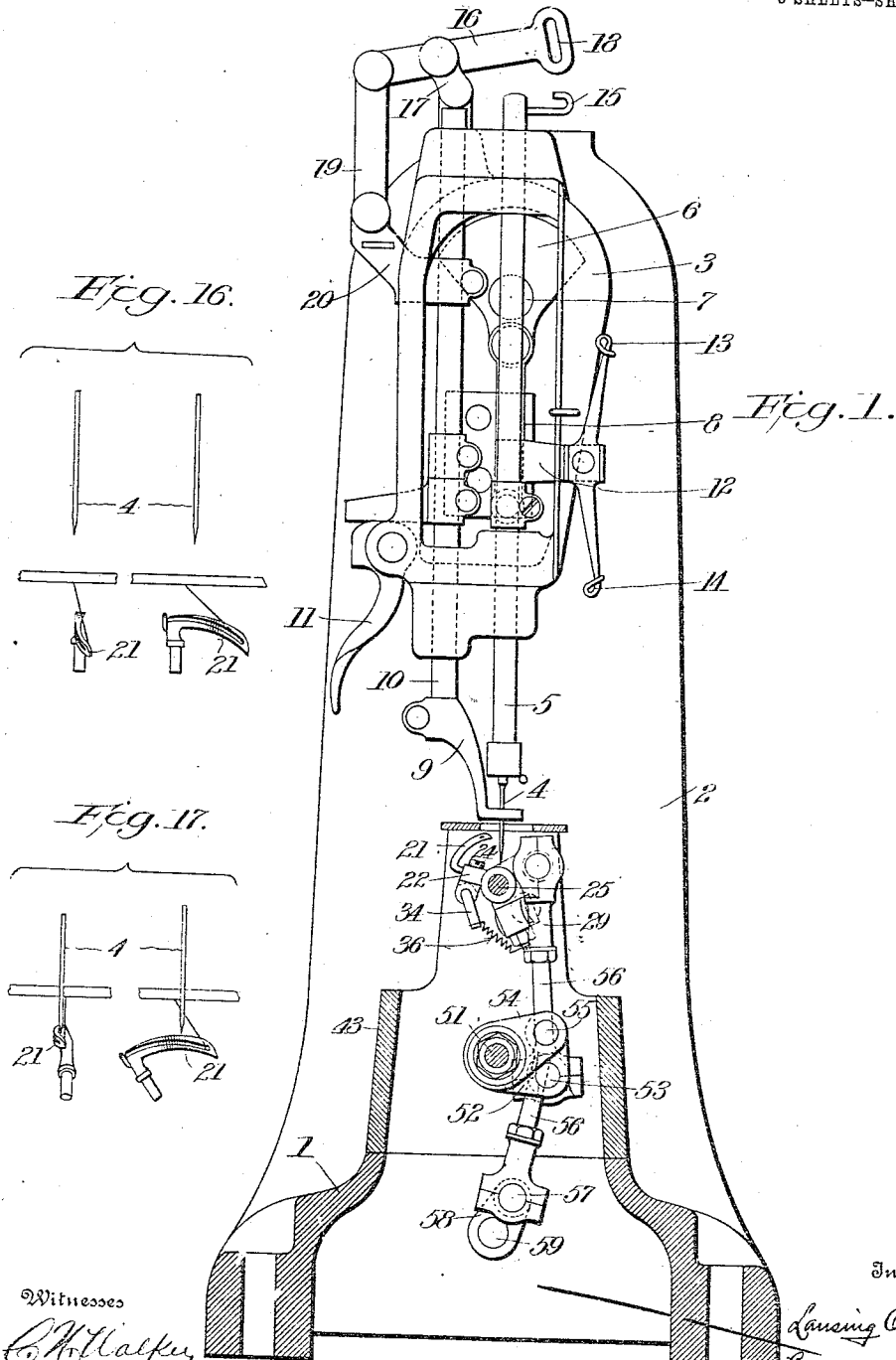


L. ONDERDONK.
 LOOPER OPERATING MECHANISM FOR SEWING MACHINES.
 APPLICATION FILED SEPT. 10, 1907.

1,129,590.

Patented Feb. 23, 1915.

3 SHEETS—SHEET 1.



Witnesses
C. Walker
Albert Popkain

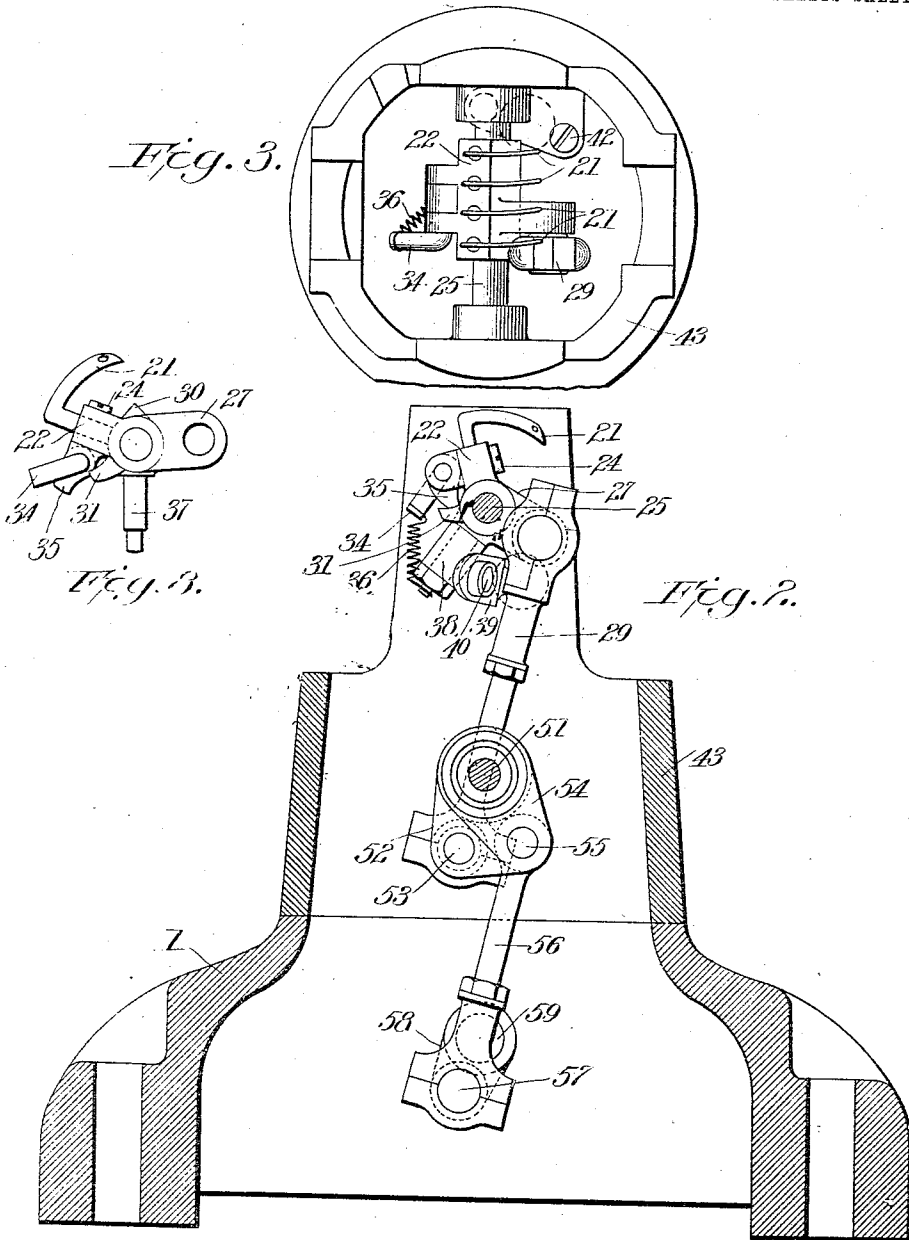
Inventor
Lansing Onderdonk
 By *Hintermuth & Mason*
 Attorneys

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3 SHEETS-SHEET 2.



WITNESSES:
C. H. Walker.
Albert Popkin

INVENTOR
Lansing Onderdonk.
 BY *Sturtevant & Mason*
 Attorney S

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3 SHEETS—SHEET 3.

Fig. 4.

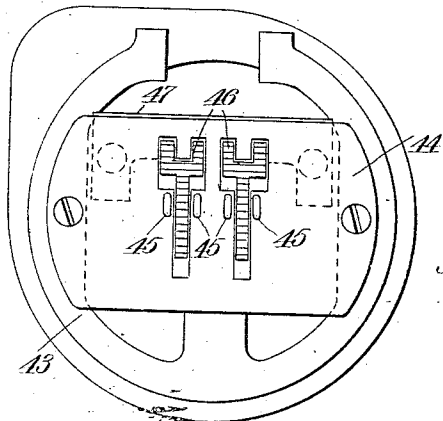


Fig. 7.

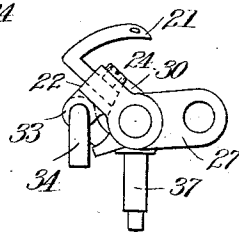


Fig. 11.

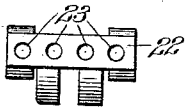


Fig. 12.

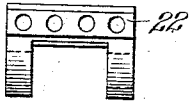


Fig. 13.

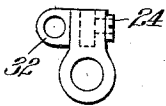


Fig. 14.

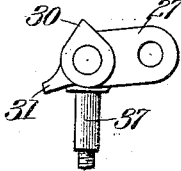
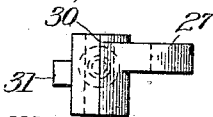


Fig. 15.



WITNESSES:

C. M. Walker
Albert Pophin

Fig. 5.

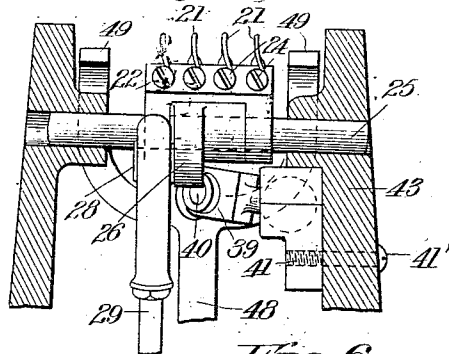


Fig. 9.

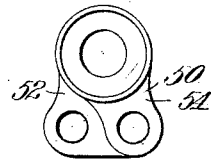


Fig. 6.

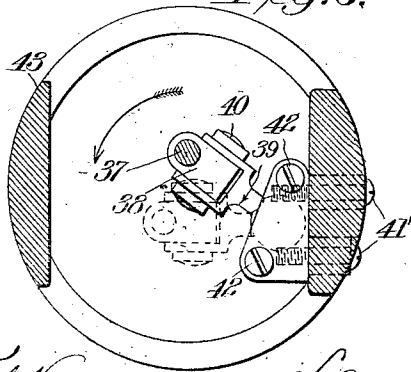
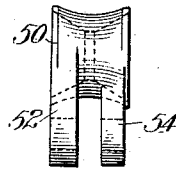


Fig. 10.



INVENTOR

Lansing Onderdonk

BY

Sturtevant & Mason

Attorneys

UNITED STATES PATENT OFFICE.

LANSING ONDERDONK, OF NEW YORK, N. Y., ASSIGNOR TO UNION SPECIAL MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LOOPER-OPERATING MECHANISM FOR SEWING-MACHINES.

1,129,590.

Specification of Letters Patent. Patented Feb. 23, 1915.

Application filed September 10, 1907. Serial No. 392,208.

To all whom it may concern:

Be it known that I, LANSING ONDERDONK, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Looper-Operating Mechanisms for Sewing-Machines, of which the following is a description, reference being had to the accompanying drawing and to the letters and figures of reference marked thereon.

My invention relates to looper operating mechanisms for sewing machines, and has for its object to provide a looper-operating mechanism which is especially adapted for use in a sewing machine having a vertical work supporting post, although it will be obvious that from certain aspects, my invention is not restricted to a sewing machine of this character.

My invention consists in the parts, arrangements and improvements hereinafter shown, described and set forth in the claims.

In the drawings which show by way of illustration one embodiment of my invention; Figure 1 is an end view, partly in section, and with parts removed, of a sewing machine embodying my improved looper-operating mechanism; Fig. 2 is a sectional view of the work support, showing the looper-operating mechanism in a different position; Fig. 3 is a top view of the work support and looper mechanism shown in Fig. 2, with the throat plate removed; Fig. 4 is a top plan view of a work support, showing the throat plate and feed dogs and needle slots; Fig. 5 is a detail sectional view of the upper end of a work support, showing the looper carrier, its operating link, and also the upper end of the feed bar; Fig. 6 is a sectional view of the upper portion of the work support, showing the arm for moving the looper carrier laterally and the bracket for supporting said arm; Fig. 7 is a detail view of the looper carrier in side elevation; Fig. 8 is a view similar to Fig. 7, with the looper thrown back into threading position; Fig. 9 is a detail in front elevation of the looper rocking lever; Fig. 10 is a view in side elevation of the same; Fig. 11 is a detail top plan view of the looper carrier; Fig. 12 is a front side view of the same; Fig. 13 is an end view of the same; Fig. 14 is a detail end view of the looper support; Fig. 15 is a top plan view of the

same; Fig. 16 is a diagrammatic view, showing the position of the needle and looper in front and in side view, when the looper is at the forward end of its stroke; and Fig. 17 is a similar view when the needle point has passed below the looper thread.

The bed plate 1 has rising therefrom a standard 2, carrying an overhanging arm, which supports at its forward end a needle head 3 of the usual construction. The needle 4 is carried by a needle bar 5, which is reciprocated in the needle head by a rotating disk 6, carried by the main shaft 7 through a link 8. The presser foot 9 is carried by a presser bar 10, which is lifted by the usual hand lever 11. The needle thread controller consists of an arm 12, mounted on the link 8 which vibrates the needle bar, and said arm 12 carries thread guides 13 and 14, at the forward end thereof. The needle bar is provided with a thread guide 15. A thread controller 16 is mounted on a bracket 17, secured to the upper end of the needle head. The thread controller 16 carries a thread eye 18 at the forward end, and is connected by a link 19 at the rear end to a collar 20 mounted on a presser bar 10.

In the present embodiment of my invention, I have shown a plurality of needles, and cooperating with each needle is a looper 21. For the sake of clearness, however, I will hereinafter refer to a single looper, it being understood, however, that either a single looper or a plurality of loopers may be used as desired. The looper 21, is mounted in a looper carrier 22, (see Figs. 11, 12 and 13). Said looper carrier 22 is provided with openings 23 to receive the shank of the looper, and said looper is held therein by a screw 24. The looper carrier is yoke shaped, and each of its arms is provided with an opening, through which extends the looper-supporting rod 25; (see Fig. 5).

Rigidly secured to the looper supporting rod 25, and forming a part of the looper support is a member 26. Said member 26 is placed upon the looper-supporting rod intermediate the arms of the looper carrier. The member 26 is provided with an outwardly extending arm 27, which carries a ball stud 28, to which is pivoted a link 29. As the link 29 is oscillated, the arm 27 through the member 26, causes the looper-

supporting rod 25 to oscillate. The member 26 is also provided with a flat shoulder or projection 30, and with an outwardly extending arm 31. The looper carrier 22 is provided with an outwardly extending arm 32, in which is pivoted a latch 33 (see Figs. 2, 7 and 8). The latch 33 consists of an outwardly extending operating arm 34, and a locking lip 35. A spring 36 is secured at one end to the arm 34, and at its other end to a downwardly projecting stem 37, formed on the member 26.

The looper carrier 22 is loosely mounted upon the looper supporting rod 25, and when in normal position the carrier is in contact with the shoulder or projection 30. At this time the latch 33 by means of the spring 36 is swung so that the lip 35 engages the outwardly extending arm 31, formed on the member 26. When, however, it is desired to tilt the looper backward, so as to bring the same back from underneath the work support in a more convenient place for threading, the arm 34 of the latch 33 is lifted and the lip 35 turned out of the path of the arm or projection 31, and the looper carrier then turned backward, as shown in Fig. 8.

The downwardly extending stud 37 of the looper support, carries a collar 38, to which is pivoted an arm 39 by a pivot stud 40. The opposite end of the arm 39 is formed with a ball support, which is secured in a similarly formed recess in the bracket 41. The bracket 41 is made in sections, as clearly shown in Figs. 5 and 6, and said sections are secured together by suitable screws 42. As the looper carrier and its support are oscillated through the link 29, the arm 39 which engages the stud 37 carried by said looper support, will cause said looper support together with the supporting rod 25 to move laterally.

The looper, as shown in the present embodiment of my invention, is mounted in the upper end of a work-supporting post 43, which has bearings formed therein to receive the looper-supporting rod 25. On the upper end of the work-supporting post 43 is secured a throat plate 44. The throat plate 44 is provided with suitable needle openings 45, and with feed slots. The feed dogs 46, which work in the feed slots are carried by a feed dog supporting plate 47, which is mounted upon the upper end of the feed bar 48. Said feed bar 48 at its upper end is provided with outwardly curved arms 49, which form an opening in which the looper may vibrate back and forth and which also permits of the looper carrier being swung backward when released, for the purpose of threading. Said work-supporting post 43, as clearly shown in Figs. 1 and 3, is provided with an opening at the rear thereof, which opening is adjacent the

throat plate or work support 44. The threaded looper when disconnected from its support may be swung rearwardly into this opening, so as to facilitate the threading thereof, as above noted.

The looper is oscillated through the link 29, which is pivoted at its lower end to a rock lever 50. Said rock lever 50 is pivoted at 51 to the work supporting post 43, and has one of its arms 52 pivotally connected at 53 to the link 29. The other arm 54 of the rock lever 50 is pivoted at 55 to a link 56, which in turn is pivoted at 57 to a crank arm 58, secured to the outer end of the shaft 59. The shaft 59 is mounted in suitable bearings in the bed plate of the machine, and is rotated by any suitable means, preferably from the main shaft 7 in the overhanging arm. The disposition of the rock shaft 54 and the pivotal connections of the links 29 and 56, are such that the looper is moved forward very quickly into the needle loop, and is given an extended dwell at the forward end of its stroke. The arm 39 moves from a position substantially at right angles to the line of feed and at a distance in front of the needle path, as shown in dotted lines in Fig. 6, to a position at an angle to the line of feed and with its outer end in rear of the needle path. The resulting movement of the looper point is from a position in rear of the needle forward into the needle loop and at the same time laterally of the line of feed so that when said looper is in its forward position, the eye thereof, is on the other side of the line of feed, and the body of the looper has practically crossed the needle path. This position of the looper at the forward end of its stroke, holds the looper thread running from the eye of said looper to the previous stitch, well to the right of the needle path, as shown in Fig. 16. The looper at this time is given an extended dwell so that the needle descends and the point thereof passes into the needle slot in the work support before the looper begins to retract. The first movements of the looper on its retracting stroke are slow and therefore, the needle point will pass the portion of the looper thread above referred to, before the looper has removed backward, but a slight distance. It is only necessary that the looper shall move back sufficiently for the needle to pass the looper on the left side thereof, as seen in Figs. 16 and 17 and between the body of the looper and the looper thread between the eye of said looper and the previous stitch. Owing to the fact that the arm 39 moves from a position substantially at right angles to the line of feed when the looper is retracted to a position at an acute angle thereto, the lateral movements of the looper will be first very slow and with increasing speed until the looper reaches its forward position. This allows

the looper to move forward with little or no lateral movement until the needle loop is engaged by the looper and the needle has risen sufficiently to allow the looper to cross its path. In order that the looper may carry its looper thread to the opposite side of the path of the needle and then retract, so that the needle will pass between the looper thread and the body of the looper, it is very evident that the looper must move back and forth in substantially the same path.

It will be noted that I have slotted the work supporting post as shown in Fig. 6 in dotted lines and, by loosening the screws 41', 41', the bracket 41 may be adjusted laterally of the post and the timing and the amount of the lateral movement given the looper thereby, increased or decreased. It will thus be seen that I have provided a looper operating mechanism wherein the looper is moved bodily across the path of the needle and the looper thread thereby so positioned that the point of the needle will with certainty pass on the proper side of said looper thread and the looper will at the same time be retracted sufficiently to allow the needle to pass on the proper side of the looper. This movement of the looper whereby the looper thread is held well to one side of the needle path, may be called a loop spreading movement of the looper for the reason that the needle is caused with certainty to enter the looper thread loop. The movement of the looper across the path of the needle to spread the looper thread loop for the entrance of the needle is not claimed broadly herein, as the same forms the subject matter of my application, Serial Number 337,990, filed October 8, 1906.

It is obvious that the looper may be moved so as to cross the needle path from the other side if desired. The only change in structure necessary to accomplish this movement of the looper, would be the curving of the looper in the opposite direction, and mounting the bracket which carries the arm 39 on the opposite side of the work supporting post.

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

1. A sewing machine including in combination, a vertical work-supporting post, a needle, a threaded looper mounted in said work support and swinging about an axis at right angles to the line of feed, a rotary shaft, and means intermediate said rotary shaft and said looper for oscillating the looper back and forth in substantially the same path and devices operated by the oscillation of the looper for moving said looper laterally to position the looper thread on the opposite side of the needle from the path of movement of the looper.

2. A sewing machine including in combination, a vertical work-supporting post, a needle, a threaded looper mounted in said work-supporting post and moving about an axis at right angles to the line of feed, a rotary shaft, means intermediate said rotary shaft and said looper for oscillating said looper back and forth in substantially the same path and for moving the looper laterally and giving thereto an extended dwell at the forward end of its stroke, whereby the looper thread is positioned upon the opposite side of the needle from the path of movement of the looper.

3. A sewing machine including in combination, a vertical work-supporting post, a needle, a threaded looper, a looper carrier mounted to oscillate about an axis at right angles to the line of feed, a rotary shaft, a link operated by said rotary shaft and connected to said carrier, and means cooperating with the carrier for moving the same laterally as it is oscillated, whereby said looper is moved back and forth in substantially the same path and is moved laterally for positioning the looper thread on the opposite side of the needle from the path of movement of the looper.

4. A sewing machine including in combination a vertical work supporting post, a looper, a carrier therefor, a rotary shaft, a link connected to said rotary shaft, for oscillating said looper, and an arm pivoted to said looper and to the work supporting post, for moving the same laterally.

5. A sewing machine including in combination a vertical work supporting post, a looper, a carrier therefor, a rotary shaft, a link connected to said rotary shaft for oscillating said looper and an arm pivoted to said looper carrier and to the work supporting post for moving the same laterally, and means for adjusting the pivotal connection of said arm to said work supporting post.

6. A sewing machine including in combination, a vertical work supporting post, a looper carrier mounted in said work supporting post, a looper carried thereby, a rotary shaft, a rock lever, means for connecting said rotary shaft to said rock lever, means for connecting said rock lever to said looper carrier, said rock lever being so disposed that said looper is given an extended dwell at the forward end of its stroke.

7. A sewing machine including in combination a vertical work supporting post, a looper carrier mounted in said work supporting post, a looper carried thereby, a rotary shaft, a rock lever, means for connecting said rotary shaft to said rock lever, means for connecting said rock lever to said looper carrier for oscillating said looper and means operated through said rock lever for moving said looper laterally, said rock lever

being so disposed that said looper is given an extended dwell at the forward end of its stroke.

8. A sewing machine including in combination a vertical work supporting post, a looper carrier mounted in said work supporting post, a looper carried thereby, a rotary shaft, a rock lever, means for connecting said rotary shaft to said rock lever, means for connecting said rock lever to said looper carrier, for oscillating said looper and an arm pivoted to said work support and to said looper carrier for moving the same laterally.

9. A sewing machine including in combination a work support, a looper carrier, a looper mounted in said carrier, a rotary shaft, a rock lever, a connection including a link between said rotary shaft and said rock lever, a connection including a link between said rock lever and said looper carrier, an element pivoted to said looper carrier and to said work support whereby when said looper is oscillated the same may be moved laterally, and means for adjusting the connection between said element and the work support.

10. A sewing machine including in combination a vertical work support, a looper carrier, a looper support on which said looper carrier is mounted, a rotary shaft, a rock lever, a link connecting said rotary shaft to said rock lever, a link connecting said rock lever to said looper carrier, an arm pivoted at one end to said looper support and having a ball stud on its opposite end, a bracket mounted on said work support and having a socket to receive said ball stud.

11. A sewing machine including in combination a vertical work support, a looper carrier, a looper support on which said looper carrier is mounted, a rotary shaft, a rock lever, a link connecting said rotary shaft to said rock lever, a link connecting said rock lever to said looper carrier, an arm pivoted at one end to said looper support and having a ball stud on its opposite end, a bracket mounted on said work support and having a socket to receive said ball stud, and means for adjusting the position of the bracket.

12. A sewing machine including in combination a looper carrier, a looper mounted therein, a looper support swinging about the same axis as the looper carrier, and means intermediate the looper carrier and said looper support, whereby the looper carrier may be released and the looper turned backward into convenient position for threading.

13. A looper mechanism for sewing machines including in combination a looper

carrier, a looper mounted therein, a looper support-swinging about the same axis as the looper carrier, a latch for connecting said looper carrier to said looper support, whereby said looper may be oscillated backward upon said support and rendered accessible for threading.

14. A looper mechanism for sewing machines including in combination a looper carrier, a looper supported therein a looper support, a lug mounted on said looper support, a latch carried by said looper carrier and a spring for holding said latch in engagement with said lug, whereby said looper is held properly positioned upon said looper support.

15. A looper mechanism for sewing machines including in combination a looper carrier, a looper mounted therein, said looper carrier having outwardly extending arms, a looper support extending freely through said arms, a lug carried by said looper support, and a latch carried by said looper carrier and engaging said lug whereby said looper carrier may be swung about said looper support and rendered accessible for threading.

16. A sewing machine including in combination a vertical work supporting post, having a needle plate at its upper end, a looper support located beneath the needle plate, a looper carrier mounted on said support and adapted to oscillate about the axis of the looper support, means for oscillating the looper support, a looper mounted in the looper carrier, and means for detachably securing the looper carrier to the looper support whereby said carrier may be moved on the looper support independently of the oscillation of the support so that the looper may be turned back from beneath the needle plate for convenience in threading.

17. A sewing machine including in combination, a tubular casing having a work-supporting portion, a needle, a thread carrying looper beneath said work-supporting portion cooperating with said needle, a looper support, means for moving said looper support, said casing having an opening in the side thereof adjacent said work-supporting portion, and means for connecting said looper to said looper support, whereby the same may be swung independent of the movement of the support, relative to said support to a position in said opening to facilitate the threading thereof.

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

LANSING ONDERDONK.

Witnesses:

WALTER HARTLEY,
FRANKLIN H. CHILTON.