(No Model.)

3 Sheets—Sheet 1.

J. VANNETTE.

SEWING MACHINE.

No. 526,470. Patented Sept. 25, 1894.

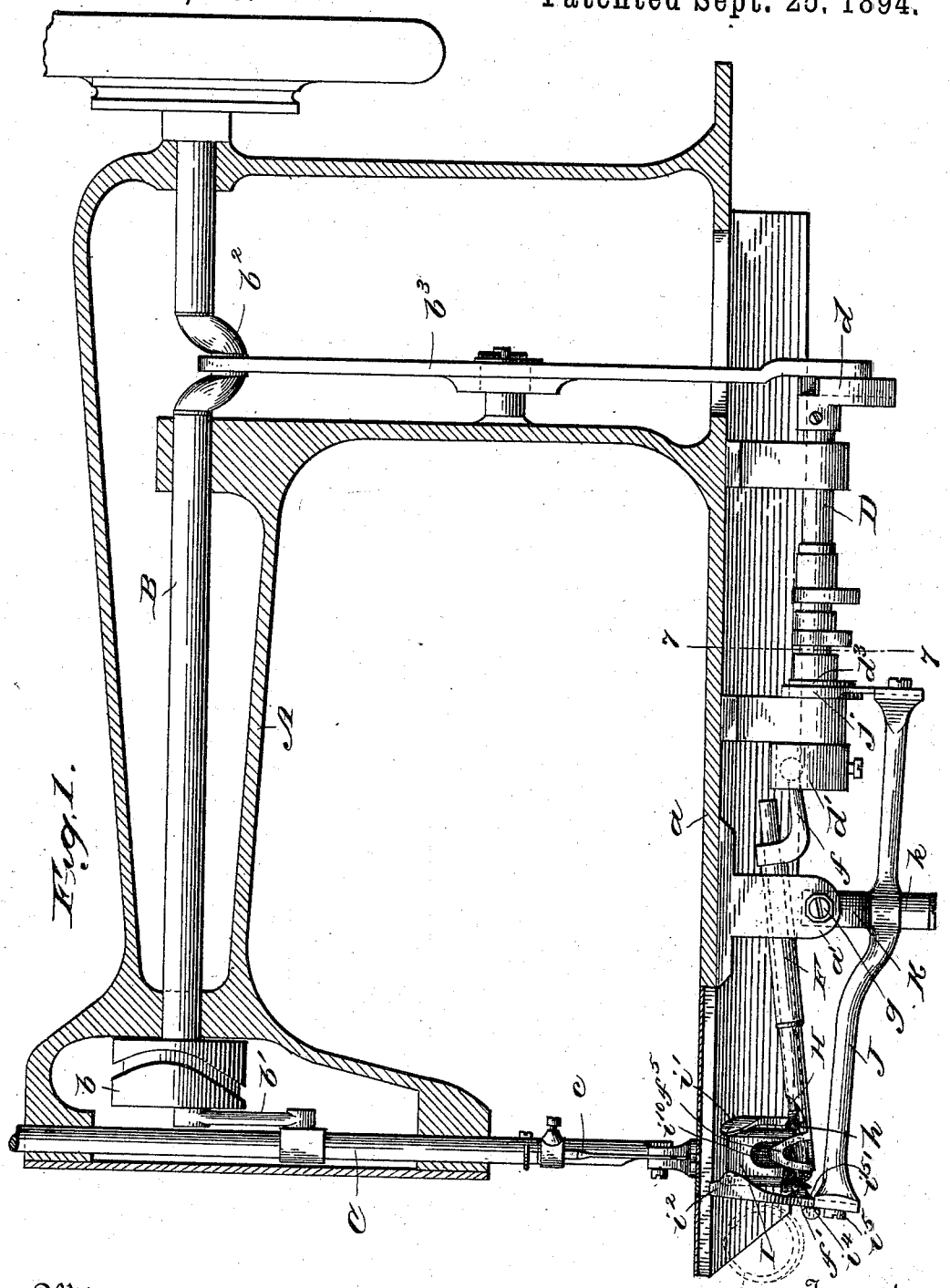

Fig. 1.

Witnesses
H. C. Goepel
C. M. Sweeney.

Inventor
Jesper Vannette,
by Macleod, Calvert & Randall,
Attorneys.

(No Model.) 3 Sheets—Sheet 2.

J. VANNETTE.

SEWING MACHINE.

No. 526,470. Patented Sept. 25, 1894.

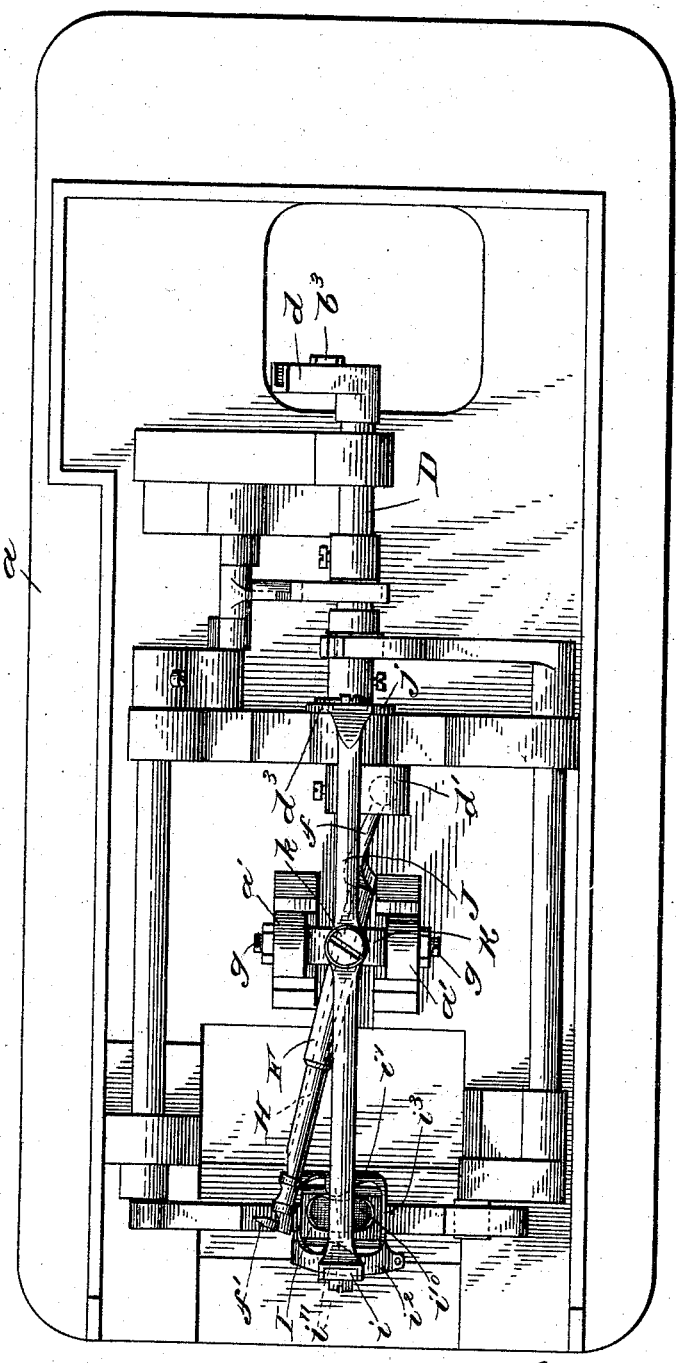

Fig. 2.

Witnesses
C. M. Sweeney.

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(No Model.)

3 Sheets—Sheet 3.

J. VANNETTE.

SEWING MACHINE.

No. 526,470. Patented Sept. 25, 1894.

Fig. 3.

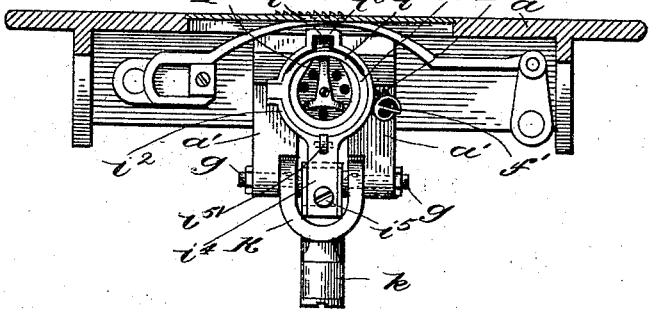


Fig. 5.

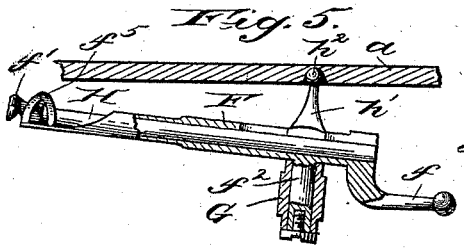


Fig. 6.

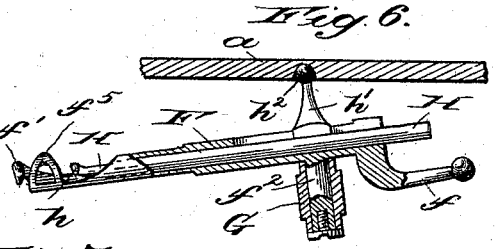


Fig. 7.

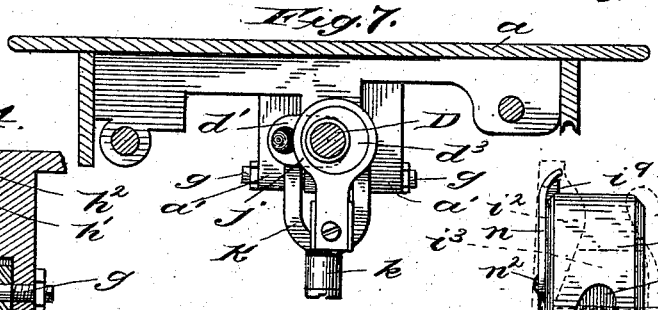


Fig. 4.

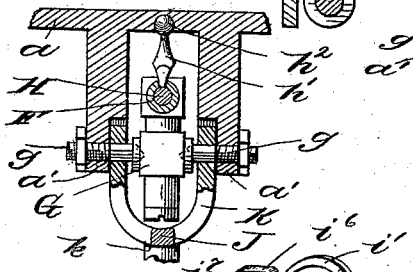


Fig. 8.

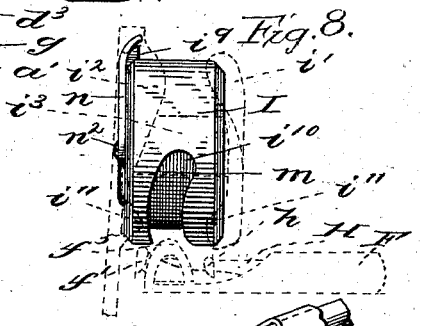


Fig. 9.

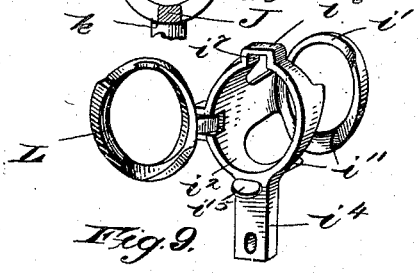


Fig. 10.

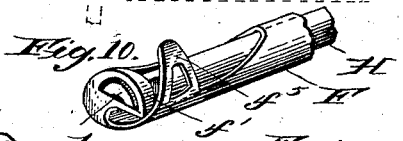


Fig. 11.

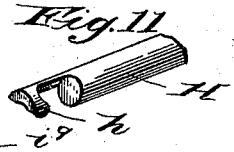


Fig. 12.

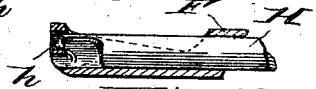
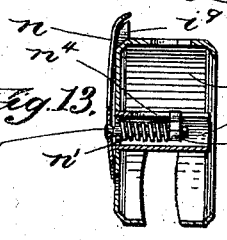


Fig. 13.



Witnesses

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UNITED STATES PATENT OFFICE.

JASPER VANNETTE, OF TIFFIN, OHIO, ASSIGNOR OF ONE-HALF TO C. J. YINGLING AND GEORGE S. YINGLING, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 526,470, dated September 25, 1894.

Application filed October 7, 1893. Serial No. 487,495. (No model.)

To all whom it may concern:

Be it known that I, JASPER VANNETTE, a citizen of the United States, residing at Tiffin, in the county of Seneca and State of Ohio, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to that class of lock stitch sewing machines in which the needle thread is carried around the lower or locking thread, supplied from a bobbin held in a bobbin case, by a circularly moving hook; the object of my invention being to provide a machine of this class which will run lightly and noiselessly, and which will be adapted to run at high rates of speed.

In carrying my invention into effect the circularly moving or gyratory hook which catches the loops of needle thread is carried at the end of a lever which is preferably made tubular and which is hung upon pivots at right angles to each other to form a universal joint so that the said lever may be free to move in different planes permitting its forward end, at which the loop-seizing hook is located, to travel in a circular path, the said lever having at its rear end an arm entering a suitable opening or socket formed in a crank carried by a rotating shaft located below the work plate of the machine and operated from a driving shaft journaled in the upper part of the arm of the machine through any suitable well known connections.

Within the tubular hook-carrying lever is placed a sliding shaft or plunger provided at its outer end with a hook which, as the hook-carrying lever operates, is caused to travel toward and from the loop-seizing hook in such a manner that the spreading hook will be housed within the loop-seizing hook when the latter takes a loop of needle thread, but will travel away from the said loop-seizing hook when the latter moves from the top to the bottom of the bobbin case, thereby spreading the loop of needle thread laterally so that it will be carried around a relatively thick bobbin case, with but little friction on the latter, the sliding movements of the plunger carrying the loop-spreading hook being derived from the vibratory movements of the lever carrying the loop-seizing hook.

The bobbin case with its contained bobbin is sustained by a suitable skeleton frame or bobbin-case supporter which is provided with shoulders for disengaging the loops of needle thread from the loop-seizing and spreading hooks at the proper times; and, co-operating with said hooks, to insure the passage of the loops of needle thread around the bobbin case, is a gyratory or circularly moving loop-pusher which, after a loop of needle thread has been disengaged from the loop-seizing and spreading hooks, engages the loop positively and carries it around past the center of the bobbin case on the under side of the latter.

The bobbin-case supporter is preferably carried by a lever mounted upon a universal joint and operated by an eccentric on the lower rotating shaft in such a manner as to cause the said bobbin-supporter to travel in a circular path in a direction opposite to the movement of the gyratory or circularly moving hooks which carry the needle thread around the bobbin-case and bobbin, this movement of the bobbin supporter lowering the bobbin-case so as to give plenty of room for the circularly moving hooks to pass above it when a loop of needle thread is to be taken, and then lifting the bobbin-case so as to bring it relatively close to the under side of the work-plate when the said hooks pass beneath it to carry a loop of needle thread around it, these movements of the bobbin-supporter enabling the bobbin-case to be encircled with a smaller loop of needle thread than would be required were the bobbin-supporter stationary, while the descending movement of the bobbin-supporter pulls a slight amount of slack thread from the bobbin for the formation of the next succeeding stitch.

In the accompanying drawings, Figure 1 is a sectional side view of a sewing machine embodying my invention, and Fig. 2 is a bottom view thereof. Fig. 3 is a front end view of the lower part of the machine looking from the left in Fig. 1. Fig. 4 is a detail section to show the axes of the gyratory levers. Figs. 5 and 6 are detail sectional views in different positions of the tubular hook-carrying lever,

showing the spreading-hook plunger working therein. Fig. 7 is a detail section on line 7—7 Fig. 1, and Figs. 8 to 13, inclusive are details.

A denotes the arm, and *a* the work-plate of the machine.

Journaled in the upper part of the arm A is the main rotating driving shaft B provided at its forward end with a crank *b* connected by a link *b'* to the needle bar C carrying the usual eye-pointed needle *c*. The shaft B is also provided with a crank b^3 connected by the pitman-lever b^3 with a slotted crank arm *d* formed on the rear end of the rotary shaft D journaled beneath the work-plate of the machine and provided at its forward end with a crank arm *d'* having a suitable socket or recess which is entered by an arm *f* of the tubular hook-carrying lever F, the latter being provided at its forward end with the loop-seizing hook *f'*.

The lever F is provided with a vertical axis pin f^2 fitted for easy movement within a rocker G hung to the lugs *a'* depending from the work-plate *a* by horizontal pivots or center screw *g* which are at right angles to the axis or pivot pin f^2 of the lever F. By thus mounting the lever F on two axes or pivots which are at right angles to each other it will be obvious that said lever is capable of universal movement, so that by operating its rear end from the rotary crank *d'* a gyratory or circular movement will be imparted to the forward or hook-carrying end of the said lever to carry the hook around the bobbin case and bobbin.

Mounted within the tubular lever F, so as to have a free sliding movement back and forth therein, is the plunger H provided at its forward end with the loop-seizing hook *h*, and having, above the rocking block G, the arm *h'* terminating at its upper end in a ball or rounded portion h^2 fitting in a suitable socket on the under side of the bed-plate *a*, this socket forming a resistance point which will cause the plunger H to slide back and forth in the lever F as the latter vibrates vertically in performing its circular movements, these parts being so constructed and arranged that when the outer end of the lever F is in its highest position, and a loop of needle thread is to be taken, the spreading hook *h* will be housed within the loop-seizing hook *f'* (the latter having an opening or recess to receive the hook *h*) but when the parts are in the position shown in Fig. 1, and the hooks have moved down below the bobbin case the spreading hook will have traveled away from the loop-seizing hook so as to spread the loop of needle thread laterally in such a manner that it will readily pass around the relatively thick bobbin-case I. The lever F is provided in its upper side with a slot through which the arm *h'* on the plunger H extends, said arm working in said slot as the said plunger slides back and forth in the lever F when the latter is in operation. The said bobbin case I, (which carries a disk bobbin of ordinary construction from which the lower or locking thread is supplied,) is loosely held between two separated rings *i'* and i^2 which constitute the bobbin-case supporter, the ring *i'* being connected to the ring i^2 by the arm or bridge i^3, and the ring i^2 being provided with a vertical arm i^4 by which it is connected, by a screw i^5, to the lever J hung on a vertical pivot *k* depending from the loop or bail K connected to the lugs *a'* by the pivots *g*, the said lever J having rigidily attached to its rear end the strap *j* encircling the eccentric d^3 on the lower rotating shaft D, said eccentric serving to give a gyratory or circular movement to the opposite ends of the lever J so as to cause the bobbin supporter carried at the forward end thereof to travel in a circular path, and the said eccentric being so arranged that this movement of the bobbin supporter will be in opposition to the gyratory or circular movement of the forward end of the hook-carrying lever F. This result is effected by so arranging the eccentric d^3 that its throw is directly opposite to the throw of the crank arm *d'* on the shaft D. (See Fig. 7.)

To the ring i^2, forming a part of the bobbin supporter, is hinged the ring L which may be so swung aside for the insertion and removal of the bobbin case with its contained bobbin, the said ring, which serves as a swinging gate, being held closed by means of a turning button, i^{51}, or other suitable latch. Between the ring i^2 of the bobbin-supporter and the upper portion of the swinging gate L, which serves to hold the bobbin therein, is left a slight recess at i^{12} which prevents the catching of the bobbin thread by the said gate when the latter is closed. The ring i^2 of the bobbin supporter is provided at its upper side with a projection i^6 in which is formed a recess i^7 entered by a projection or arm on the bobbin-case, this construction of these parts serving to hold the bobbin case stationary.

The bobbin case I is provided with a central sleeve i^8 on which the bobbin *m* is journaled, said bobbin-case being provided with a suitable tension device shown, in the present instance, as the tension arm *n* the outer end of which bears against a projection i^9 formed on the bobbin case and between which arm and projection the bobbin thread passes. The tension arm *n* is yieldingly pressed against the projection i^9 on the bobbin case by a small coil spring *n'* surrounding a screw n^2 extending within said sleeve i^8 said screw being provided with a nut n^3 having a small lug entering a slot n^4 in the sleeve i^8, to keep said nut from turning when the screw n^2 is turned to regulate the tension, the head of said screw bearing against the tension arm *n*.

The bobbin supporter is provided with the cast-off shoulders i^{11} arranged on the lower front side of the bobbin case and in such relation to the loop seizing and loop spreading hooks *f'* and *h* that as the said hooks pass around beneath the bobbin supporter the two parts of a loop of needle thread held thereby

will be disengaged from said hooks by reason of the contact of the thread with said shoulders.

The lever F is provided between the hooks f' and h, when the latter are separated from each other, with a loop pusher f^5 which engages the loop of needle thread after it has been dropped by the said hooks and forces it positively around beneath the lower side of the bobbin case so as to insure its forward passage around the latter, thereby preventing any possibility of the loop being drawn backward by the take-up when the latter comes into operation to draw up the loop and tighten the stitch.

The bobbin case I is provided with a circumferential slot or recess i^{10} which permits the point of the loop pusher f^5 to enter slightly within the outer circumference of the said bobbin-case, and thus insures a proper hold on the loop of thread by the said thread pusher until the latter has passed far enough around the bobbin case to permit the take-up to draw up the loop, this latter operation disengaging the loop from the loop pusher.

I have incidentally shown in connection with that part of the sewing machine to which my invention more particularly relates a feeding mechanism, but as the latter forms no part of the present invention and as it is not herein claimed it need not now be described.

In the operation of my machine the needle descends, and as it rises and throws out a loop in the usual manner the loop is taken by the hook f' carried at the forward end of the gyratory lever F, the loop-spreading hook h being at this time housed within a suitable recess or opening formed in the said hook f'. In the operation of the lever F on its universal joint, afforded by the two pivots at right angles to each other on which the said lever is hung, the forward end of said lever is caused to travel in a circular path so that the loop of needle thread is carried around the bobbin case held in the bobbin supporter, and as the loop-seizing and loop-spreading hooks travel around from their uppermost to their lowermost positions, the latter hook is caused to recede from the former thereby spreading the loop of needle thread laterally so that it readily passes around the relatively thick bobbin case held in the bobbin-supporter, this spreading of the loop preventing undue friction on the needle thread. When the hooks f' and h have reached a position about central beneath the bobbin case the loop of needle thread is drawn across the shoulders i^{11} formed on the bobbin supporter and are thereby disengaged from the said hooks, the latter both pointing toward the right in Fig. 3 or toward the point of view in Fig. 1, so that the loops can thus be readily disengaged therefrom. The loop of needle thread after being released from the hooks f' and h is engaged by the loop pusher f^5 carried by the lever F and is thereby positively forced around beneath the center of the bobbin case so as to be in position to be drawn up by the take-up when the stitch is tightened. The bobbin-supporter carried by the lever J has meanwhile been moving in a circular path in opposition to the movements of the forward end of the lever F and the hooks carried thereby, the said bobbin supporter being lowered when the hooks are in their loop-seizing position, so as to give plenty of room for the hooks to pass above the same, and being lifted when the hooks are beneath the same so as to permit the bobbin to be encompassed by a smaller loop than would otherwise be possible, the lowering movements of the bobbin case drawing a small amount of slack from the bobbin thread for the formation of the next succeeding stitch and the co-operating opposite movements of the hooks and bobbin supporter insuring the proper formation of stitches at high rates of speed.

I do not wish to be understood as limiting my invention to the details herein shown and described, as these may be varied within the province of mechanical skill without departing from the spirit of my invention; also certain parts of my invention may be employed without using certain other parts. For example, the gyratory loop pusher might be used in connection with a stationary bobbin-supporter and bobbin-case instead of with the movable bobbin-supporter herein described, and the feature of the cast-off shoulders on the bobbin supporter, for disengaging the loops of needle thread from the gyratory hooks, might be employed with a stationary bobbin-supporter or, in some instances, without the co-operating loop-pusher.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a bobbin-supporter, a bobbin case and bobbin sustained by the latter, loop-seizing and loop-spreading hooks, means for imparting a continuous circular movement to said hooks for the purpose of carrying the needle thread around the bobbin case and bobbin, means for moving said loop-spreading hook from and toward said loop-seizing hook, laterally, and a circularly moving loop pusher serving to insure the passage of the loops of needle thread around the bobbin case after said loops are disengaged from said hooks.

2. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a bobbin supporter, a bobbin case sustained by the latter and provided with a circumferential slot or recess, a circularly moving loop-seizing hook for carrying the needle thread around the said bobbin case, and a movable loop pusher co-operating with said hook, and serving to insure the passage of loops of needle thread around the bob-

bin case, the point of said loop-pusher extending into the said circumferential opening or recess in the bobbin-case so as to be within the outer circumference of the latter.

3. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a loop-seizing hook, a bobbin supporter, a bobbin case and bobbin sustained by the latter, means for imparting circular movements to the said hook and means for imparting circular movements to the said bobbin supporter in opposition to the circular movements of the said hook.

4. In a sewing machine, the combination with a needle and its operating mechanism, of a circularly moving loop-seizing hook and a co-operating loop-spreading hook, and a bobbin supporter provided with disengaging parts or shoulders for releasing the loops of needle thread from said hooks.

5. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a circularly moving loop-seizing hook, a co-operating loop-spreading hook, a bobbin supporter provided with disengaging shoulders for releasing the loops of needle thread from said hooks, and a loop-pusher moving with said hooks and serving to carry the loops of needle thread forward after having been released from said hooks.

6. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a bobbin supporter, a bobbin case and bobbin sustained by the latter, a tubular gyratory lever mounted on a universal joint and provided at its outer end with a loop-seizing hook, and a plunger fitted to slide within the said gyratory lever and provided at its outer end with a loop spreading hook.

7. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a bobbin supporter, a bobbin case and bobbin sustained by the latter, a tubular gyratory lever mounted on a universal joint and provided at its outer end with a loop-seizing hook, a plunger fitted to slide within the said gyratory lever and provided at its outer end with a loop-spreading hook, said plunger being provided with a rigid upwardly extending arm having a rounded or ball-like termination, and a stationary socket into which the rounded end of said arm fits.

8. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a lever, as J, having a universal joint and carrying at its forward end a bobbin supporter, a rotating eccentric for operating said lever, a bobbin case and bobbin sustained by said supporter, a gyratory lever, as F, also mounted upon a universal joint and provided at its forward end with a loop-seizing hook, means for imparting gyratory movements to said levers, and a loop-spreading hook movable toward and from the said loop-seizing hook and co-operating with the latter, substantially as set forth.

9. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a lever, as J, having a universal joint and carrying at its forward end a bobbin supporter, a rotating eccentric for operating said lever, a bobbin case and bobbin sustained by said supporter, a lever, as F, also mounted upon a universal joint and provided at its forward end with a loop-seizing hook, a thread pusher carried by said lever adjacent to said hook, means for imparting gyratory movements to said levers, a loop-spreading hook movable toward and from the said loop-seizing hook and co-operating with the latter, substantially as set forth.

10. In a sewing machine, the combination with a needle bar and needle and their operating mechanism, of a skeleton bobbin supporter consisting of the rings i' and i^2 and the connecting arm or bridge i^3, a bobbin case and bobbin sustained by said bobbin supporter, a swinging gate consisting of the ring L hinged to the said ring i^2 and adapted to be swung aside for the insertion or removal of the bobbin case, there being between the upper portion of the said gate and the said ring i^2 a recess or space i^{12} to prevent the catching of the bobbin thread between the said ring i^2 and the said gate when the latter is closed.

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

JASPER VANNETTE.

Witnesses:
HENRY CALVER,
CASSIE M. SWEENEY.