

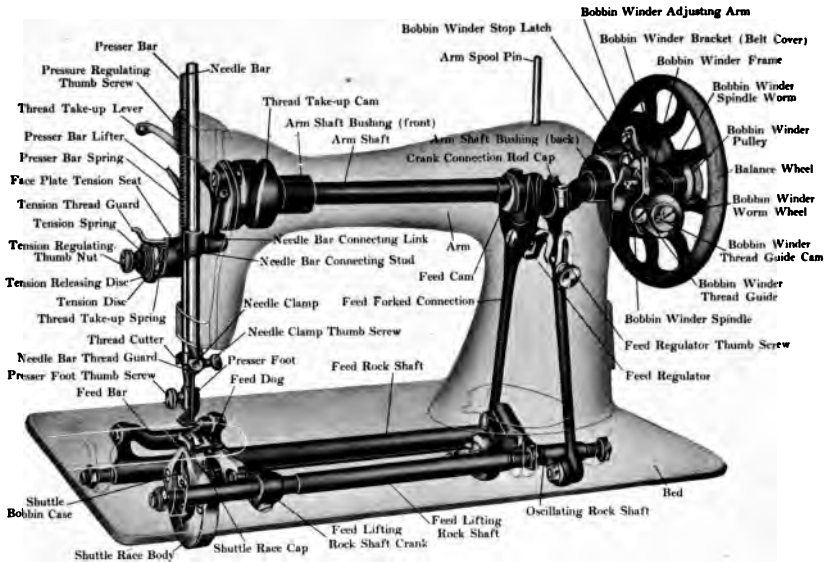
Singer Machine: "The New Family"

In 1865 the "New Family" was put on the market and had a large and wide distribution; more than four millions of this type were sold up to 1882 and it is still in demand in various countries of the world. The machine makes a lock-stitch by means of a straight eye-pointed needle and a longitudinally reciprocating shuttle. The needle-bar derives its motion from a pin on the end of a rotating horizontal main shaft, the pin entering a heart-shaped groove in a block attached to the needle-bar. A bevel gear on the main shaft, connects with a vertical shaft provided at its lower end with a crank, connected by link with the shuttle driver or carrier. The four-motion feed-dog is operated through the horizontal lever actuated from the vertical shaft. The feed is adjusted through a movable fulcrum, controlled by a set-screw. A take-up lever controls the thread between the tension device and the eye of the needle.

In 1867 a modification of the "New Family" called "No. 1 Drop Feed," was produced, and in 1870, the "Medium," an enlarged "New Family" was used extensively for light manufacturing.

The "Medium" machine, identical with the "New Family" except that it has more room under the arm (length of arm, 12 inches), was larger and designed for stitching heavier material.

The No. 4 machine was identical, except in size, with the "New Family" and "Medium." It had 15 inches length of overhanging arm and was made in response to the demand of clothing manufacturers for a machine for power operation.

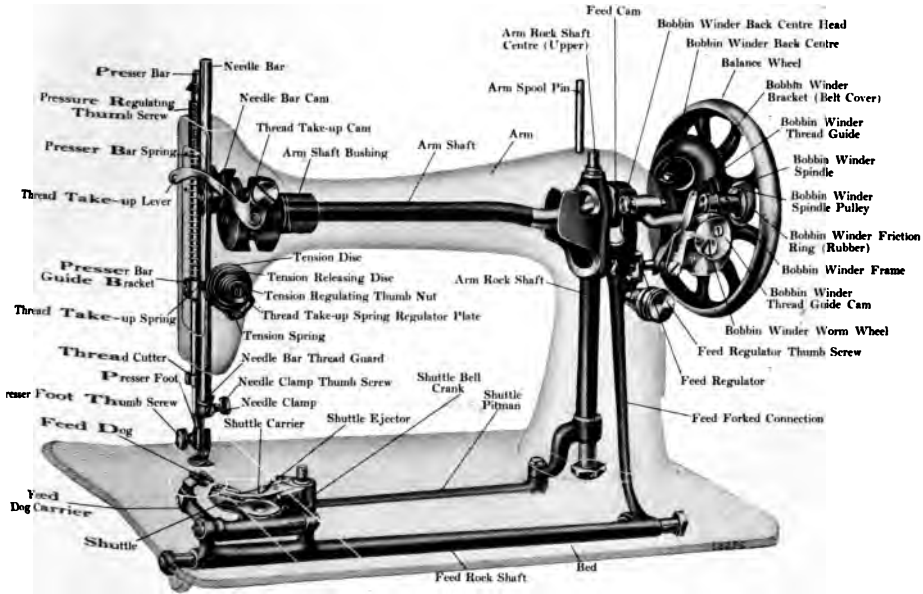


Singer Machine No. 15-30 Oscillating Shuttle

Mechanism of Machine No. 15-30, a modern variety of Oscillating Shuttle Machine for light fabrics. 1600 stitches per minute

In 1879 the "Oscillating Shuttle" mechanism was patented and this laid the foundation for the "Improved Family" (Class 15) and the "Improved Manufacturing" (Class 16) of to-day.

The scientific design of the oscillating shuttle machines marked the beginning of a new era in sewing mechanism. The utmost care is taken in the shaping, construction and "timing" of all the various parts so that the machines shall produce perfect stitching with the least expenditure of energy, the least noise of action, and the greatest number of stitches in a given time. The original principles have since been embodied in many types and varieties of Singer machines now on the market and in use in many lines of manufactures, where they are accepted as most efficient for their special purposes.



Singer Machine No. 127-3 Vibrating Shuttle

Mechanism of Machine No. 127-3, the V. S. Machine of to-day

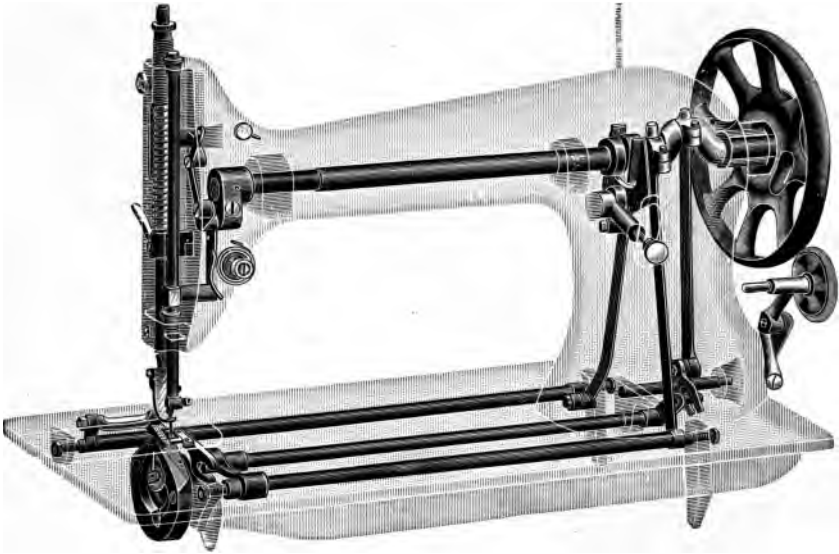
The vibrating shuttle machine (V. S. No. 1) for foot power operation was patented in 1885 but was superseded by the V. S. No. 2, in 1887, which has been in vogue ever since, and millions of these machines are now in family use all over the world. They are distinguished for simplicity and strength of mechanism and are now known, in a modified form, as No. 127-3, illustrated above.

The vibrating shuttle is boat shaped and carries for cargo the bobbin containing the under thread.

It is illustrated on page 57.

It has a semi-circular movement or "throw" similar to a weaver's shuttle and makes a complete stitch at each movement in one direction, and is then carried back to begin the next stitch.

The stitch formation by this and other types of shuttles is illustrated and described on succeeding pages.



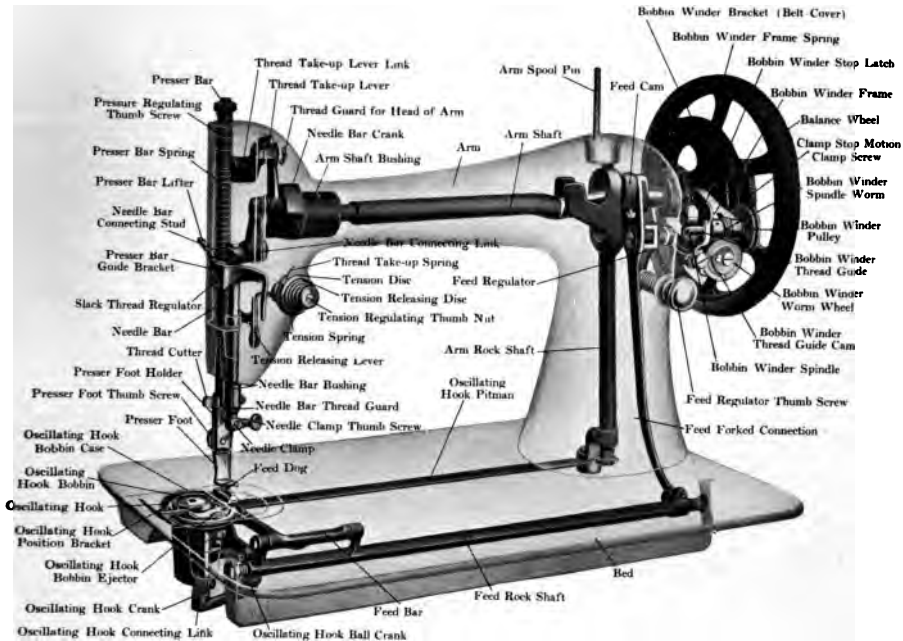
**Singer Machine No. 31-15
Oscillating Shuttle**

**Mechanism of Machine No. 31-15, the modern machine
for Clothing manufacture**

The above illustration shows the stitching mechanism of this machine, successfully combined to obtain the highest efficiency, and having a small number of moving parts, all capable of easy adjustment.

The link thread take-up consists of a light and strong lever and link, working silently, without use of cam or spring. A speed of 2,200 stitches per minute can be attained without undue vibration of the machine and with least friction and wear of parts.

The machines of this Class were introduced in the year 1895.



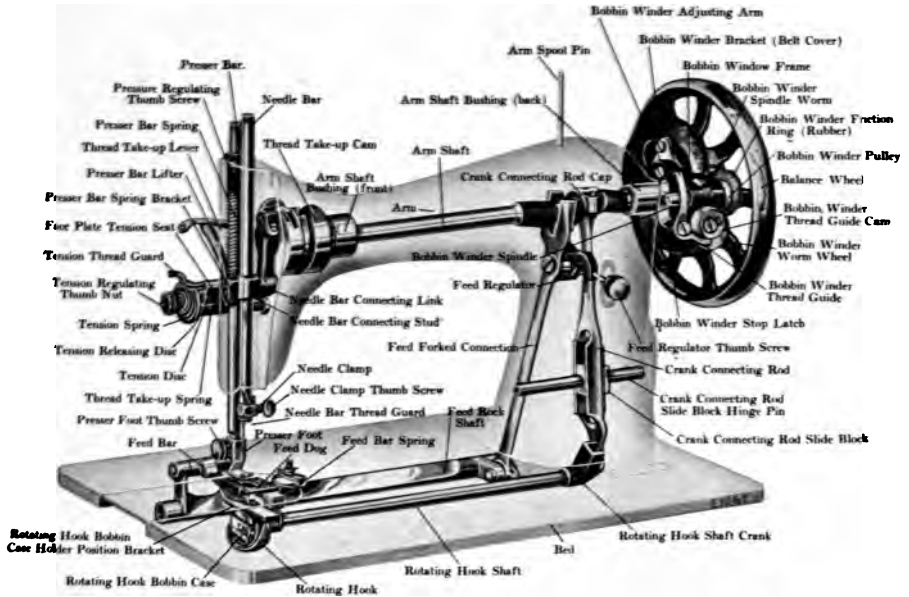
Singer Machine No. 66-1 Oscillating Hook

Mechanism of Machine No. 66-1

“The Singer 66,” for family sewing, was brought out in 1900 and has been fitly named **“the 20th Century Sewing Machine.”**

It has link take-up and concealed needle-bar; the central bobbin in its case lies at the top where it is easily accessible and the lower thread is handled by an oscillating hook.

The central bobbin hook is made from one solid piece of steel, hardened and polished; its simple and regular oscillation around the bobbin requires but little power and is efficient and economical for lock-stitch sewing machines. The central bobbin has capacity for 100 yards of No. 60 cotton, and its delivery of under thread to the material is perfect.



Singer Machine No. 115-1 Rotary Hook

Mechanism of Machine No. 115-1

The use of a continuous rotating hook for the lower thread in making the lock stitch was the invention of Allen B. Wilson, who was one of the most ingenious inventors in the sewing machine field of his day. His patent of Nov. 12, 1850, covered the invention of the moving feed-bar, having teeth projecting up through the horizontal cloth-plate on the bed of the machine, in conjunction with a presser-foot coming down on the material to be sewed, thus presenting it for action by the feed bar. His patents of Aug. 12, 1851 and June 15, 1852, for an improved feeding device, and for a revolving hook for passing the upper thread around the bobbin containing the under thread, gave to the world a feed that admits the sewing of a curved seam, while the revolving hook is a marvelous piece of ingenuity and mechanical skill. The essential principles of his inventions are used in all of the rotary hook machines of to-day.

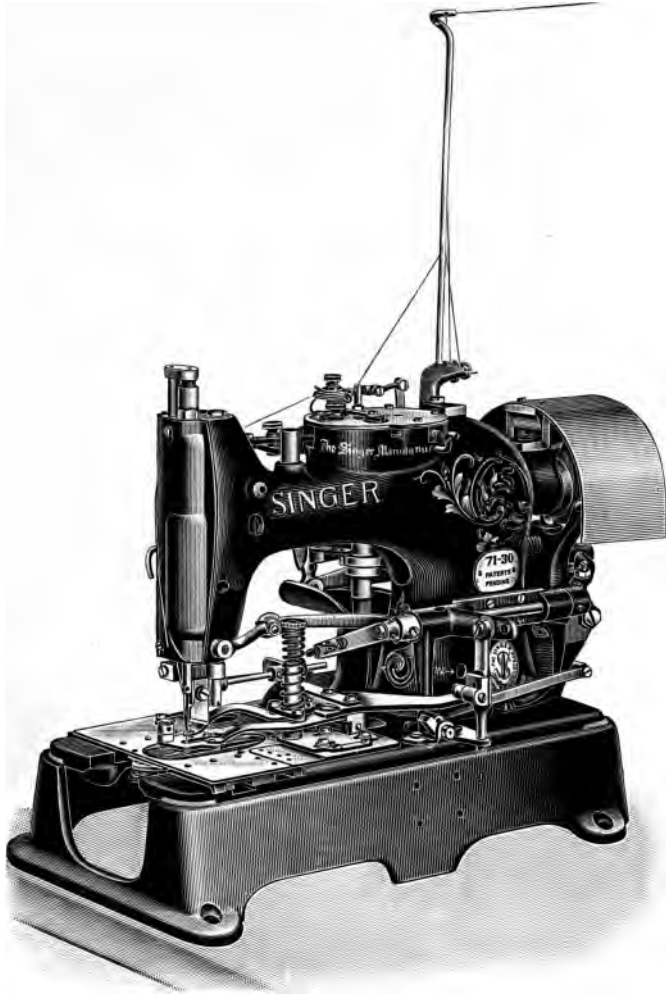


**Singer Machine No. 95-1
Rotating Hook**

**Mechanism of Machine No. 95-1, the modern high-speed lock-stitch Machine
for light fabrics, 3,500 stitches per minute**

This machine, for power operation only, has a rotating hook with stationary bobbin case enclosing the bobbin; the hook is carried upon the end of a small shaft driven by a belt from the arm shaft and operates without any friction; the outside of the hook is always perfectly clean and no work can be injured by soiled thread; the machine sets firmly and without vibration on the table, the stitch is firm and even and produced with comparatively light tensions upon both upper and under threads.

This machine was placed on the market in 1911.



Singer Machine No. 71-30

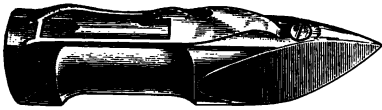
Machines of Class 71, for power operation, were brought out in 1904 and are the latest evolution for making straight buttonholes without eyelets, either purl-stitch or whip-stitch.

They are especially designed for work on Cotton and Linen Fabrics and Knit Goods; they excel all other machines, not only in the quantity of work produced, but also in the neatness of the finish and the facility with which adjustments can be made. While truly automatic, they are simple and effective, not liable to get out of order, and are easily handled by all operators.

It will be seen from the preceding description and illustrations, that the basic mechanisms now in use for making the lock stitch comprise a vertically moving bar carrying an eye-pointed needle for the upper thread, and either a vibrating shuttle or an oscillating or a rotating hook for the lower thread taken from a bobbin, and that the means for operating them vary widely according to the duty required.

The shuttles for carrying the bobbins containing the lower thread were, at first, modeled after the weaver's shuttle and were boat-shaped. The movement or "throw" of this form of shuttle is usually horizontal, either on a straight line or having a curved throw, the first being exemplified in the "New Family" and the latter in **Machine No. 127-3**.

The "oscillating shuttle," **Machine No. 15-30**, stands vertically and oscillates around a central bobbin enclosed in a removable case, while the "oscillating hook," **Machine No. 66-1**, stands horizontally and its bobbin is more easily accessible. The "rotary hook," **Machine No. 115-1**, stands vertically and rotates around a central bobbin. The shuttles and bobbins, also the formation of the stitch by the respective machines, are illustrated and described as follows:



Vibrating Shuttle, for Machine No. 127-3



Oscillating Shuttle and Central Bobbin in its case



Oscillating Hook, for Machine No. 66-1



Rotary Hook, for Machine No. 115-1

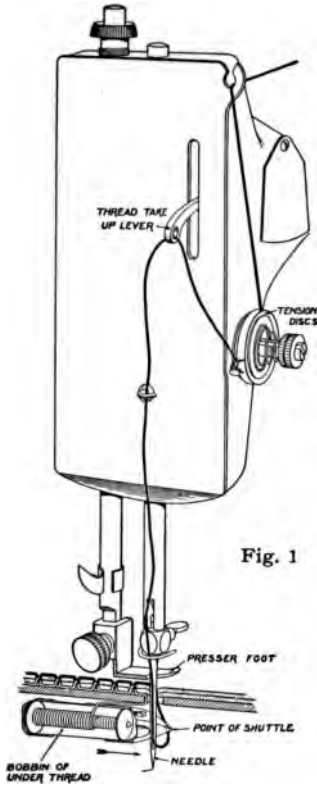


Fig. 1

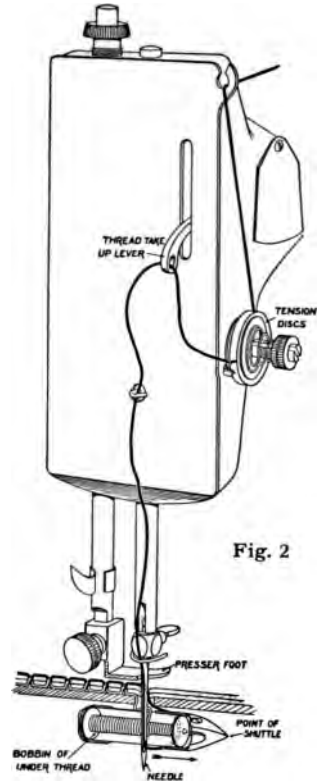


Fig. 2

VIBRATING SHUTTLE

Point of Shuttle Entering Loop of Needle Thread

Fig. 1 shows the first stage in stitch formation. The thread leading to the needle is loosened, because the thread take-up lever has begun its descent; the needle, after having descended to its lowest point, has been slightly raised and a loop of thread is thus formed which is immediately entered by the point of the

Shuttle in Loop of Needle Thread

Fig. 2 shows the second stage. The shuttle containing the bobbin of under thread, has fully entered the loop of needle thread, sufficient enlargement of the loop having been permitted by the descent of the thread take-up lever.

The shuttle travels to and fro in a carrier to which it is not fastened, but by which it is held in position. During the forward movement of the shuttle the loop of needle thread slips between the shuttle and the carrier, then passes out between the heel of the shuttle and the rear part of the carrier. The shuttle thread is thus enclosed in the loop of needle thread and both threads are then drawn up by the action of the thread take-up lever.

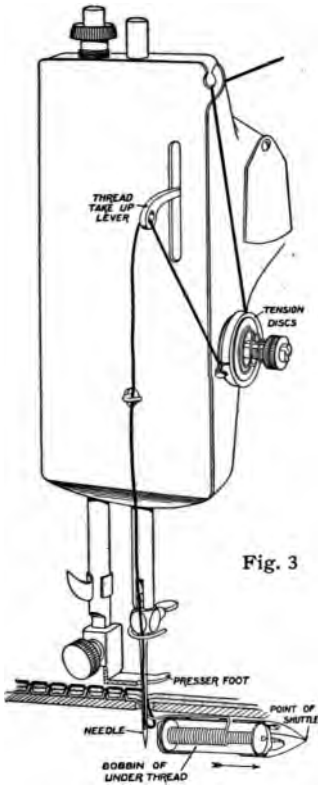


Fig. 3

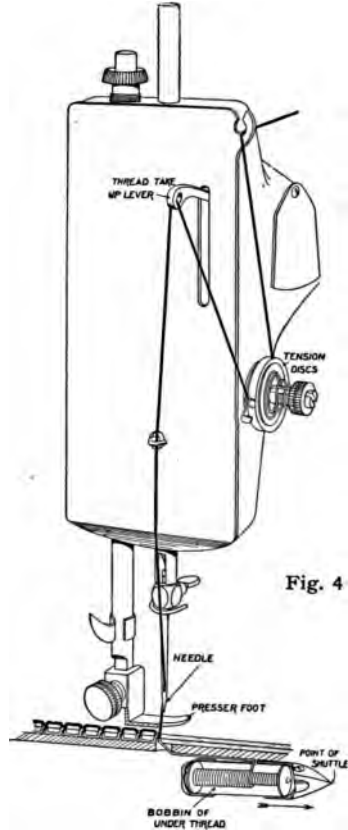


Fig. 4

VIBRATING SHUTTLE

Shuttle Thread Enclosed by Needle Thread

Fig. 3 shows the third stage. The shuttle has passed through the loop of needle thread, the shuttle thread has been enclosed by the needle thread, and the thread take-up lever is being raised to tighten the stitch.

Stitch Completed

Fig. 4 shows the stitch completed. The thread take-up lever has been raised to its highest point, drawing the needle thread, together with the shuttle thread, into the middle of the fabric, the two threads now being locked. The tension on the needle thread is regulated by the circular tension discs shown in the illustrations, and the tension on the under thread is regulated by a spring on the shuttle.

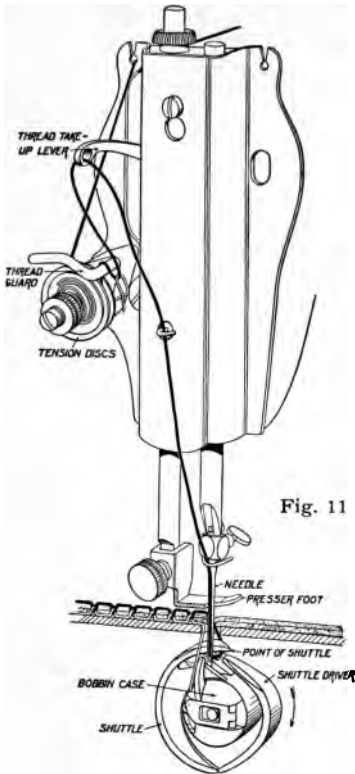


Fig. 11

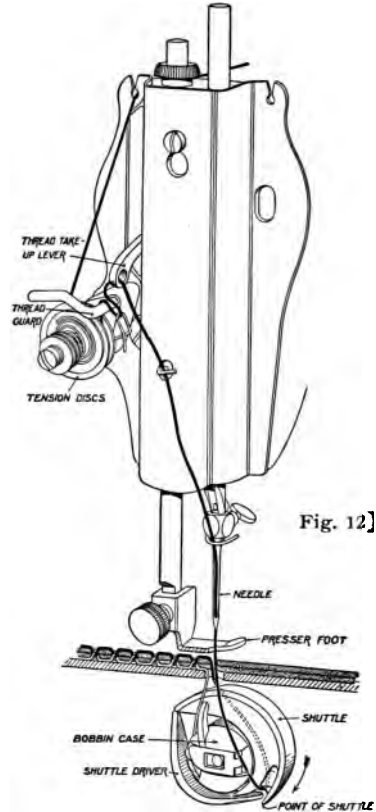


Fig. 12]

OSCILLATING SHUTTLE

Point of Shuttle Entering Loop of Needle Thread

Fig. 11 shows the first stage in stitch formation. The thread leading to the needle is loosened, because the thread take-up lever has begun its descent; the needle, after having descended to its lowest point, has been slightly raised and a loop of thread is thus formed which is immediately entered by the point of the shuttle. The oscillating shuttle makes part of a revolution during the beginning of each stitch, the direction being indicated by the arrows in Figs. 11 and 12, and during the completion of the stitch the direction of the shuttle is reversed as shown by the arrows in Figs. 13 and 14.

Loop of Needle Thread Enclosing Bobbin Case

Fig. 12 shows the second stage. The loop of needle thread has been taken down by the point of the shuttle and is being passed around the bobbin case containing the bobbin of under thread, sufficient enlargement of the loop having been permitted by the descent of the thread take-up lever.

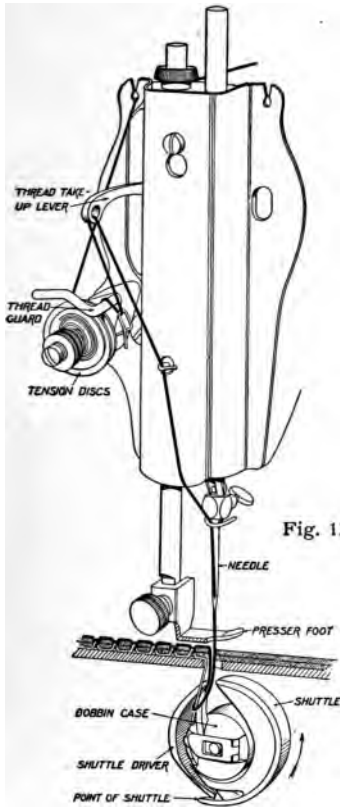


Fig. 13

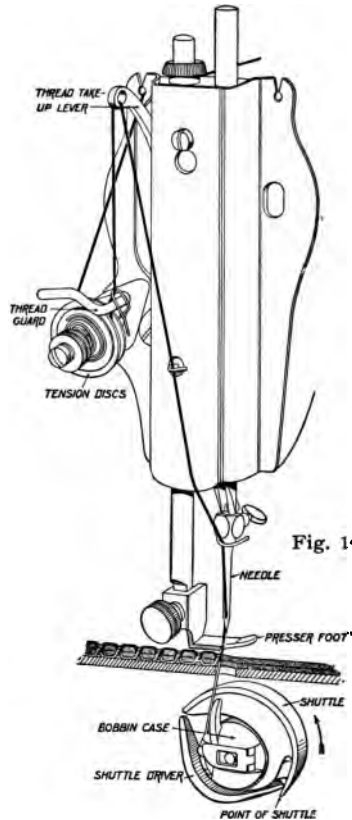


Fig. 14

OSCILLATING SHUTTLE

Under Thread Enclosed by Needle Thread

Fig. 13 shows the third stage. The loop of needle thread has been cast off from the shuttle, the under thread has been enclosed by the needle thread, and the thread take-up lever is being raised to tighten the stitch.

Stitch Completed

Fig. 14 shows the stitch completed. The thread take-up lever has been raised to its highest point, drawing the needle thread, together with the under thread, into the middle of the fabric, the two threads now being locked. The tension on the needle thread is regulated by the circular tension discs shown in the illustrations, and the tension on the under thread is regulated by a spring on the bobbin case.

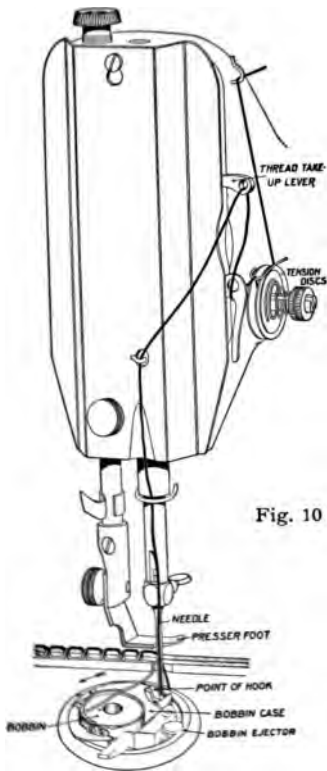


Fig. 10

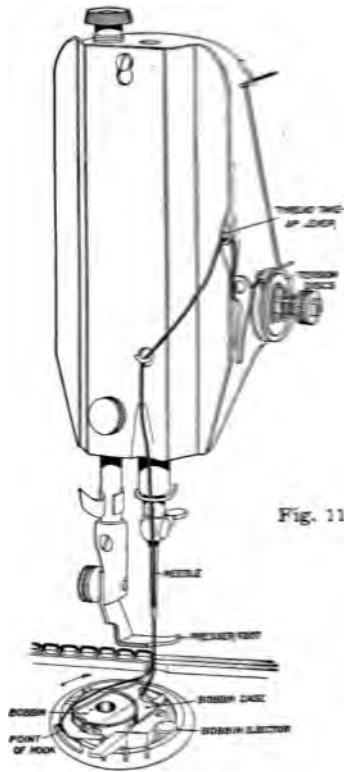


Fig. 11

OSCILLATING HOOK

Point of Hook Entering Loop of Needle Thread

Fig. 10 shows the first stage in stitch formation. The thread leading to the needle is loosened, because the thread take-up lever has begun its descent; the needle, after having descended to its lowest point, has been slightly raised and a loop of thread is thus formed which is immediately entered by the point of the hook.

This type of hook makes part of a revolution during the beginning of each stitch, the direction being indicated by the arrows in Figs. 10 and 11, and during the completion of the stitch the direction of the hook is reversed as shown by the arrows in Figs. 12 and 13.

The hook oscillates around the bobbin case which is held stationary.

Loop of Needle Thread Enclosing Bobbin Case

Fig. 11 shows the second stage.

The loop of needle thread has been taken by the point of the hook and is being passed around the bobbin case containing the bobbin of under thread. sufficient enlargement of the loop having been permitted by the descent of the thread take-up lever.

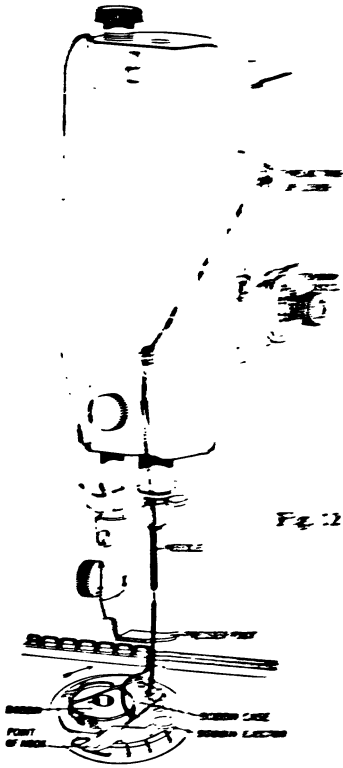


Fig. 12

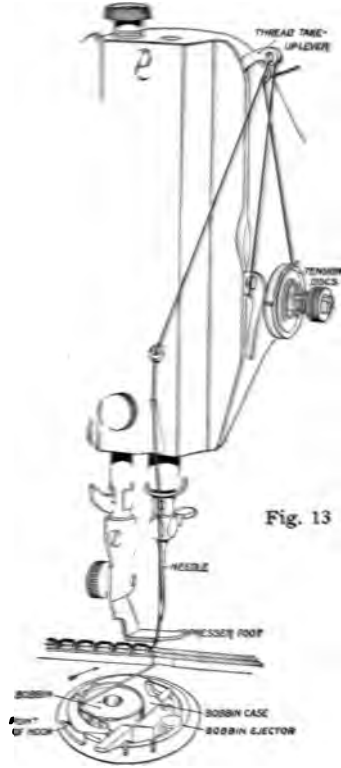


Fig. 13

OSCILLATING HOOK

**Under Thread Enclosed by
Needle Thread**

Fig. 12 shows the third stage. The under thread has been enclosed by the needle thread, and the thread take-up lever is being raised to tighten the stitch.

Stitch Completed

Fig. 13 shows the stitch completed. The thread take-up lever has been raised to its highest point, drawing the needle thread, together with the under thread, into the middle of the fabric, the two threads now being locked. The tension on the needle thread is regulated by the circular tension discs shown in the illustrations, and the tension on the under thread is regulated by a spring on the bobbin case.

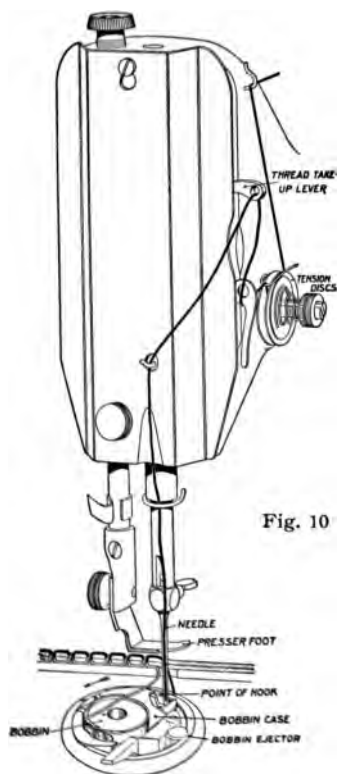


Fig. 10

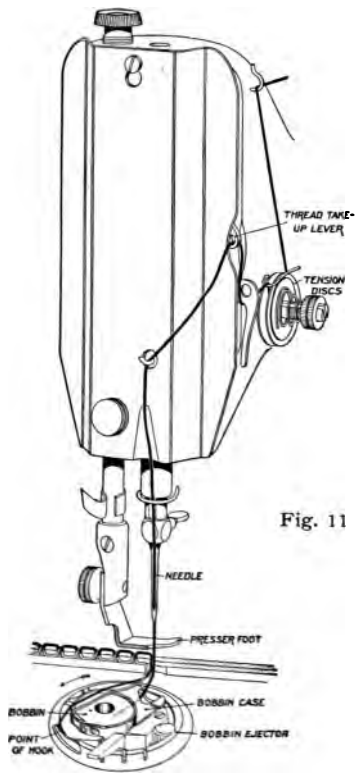


Fig. 11

OSCILLATING HOOK

Point of Hook Entering Loop of Needle Thread

Fig. 10 shows the first stage in stitch formation. The thread leading to the needle is loosened, because the thread take-up lever has begun its descent; the needle, after having descended to its lowest point, has been slightly raised and a loop of thread is thus formed which is immediately entered by the point of the hook.

This type of hook makes part of a revolution during the beginning of each stitch, the direction being indicated by the arrows in Figs. 10 and 11, and during the completion of the stitch the direction of the hook is reversed as shown by the arrows in Figs. 12 and 13.

The hook oscillates around the bobbin case which is held stationary.

Loop of Needle Thread Enclosing Bobbin Case

Fig. 11 shows the second stage. The loop of needle thread has been taken by the point of the hook and is being passed around the bobbin case containing the bobbin of under thread. sufficient enlargement of the loop having been permitted by the descent of the thread take-up lever.

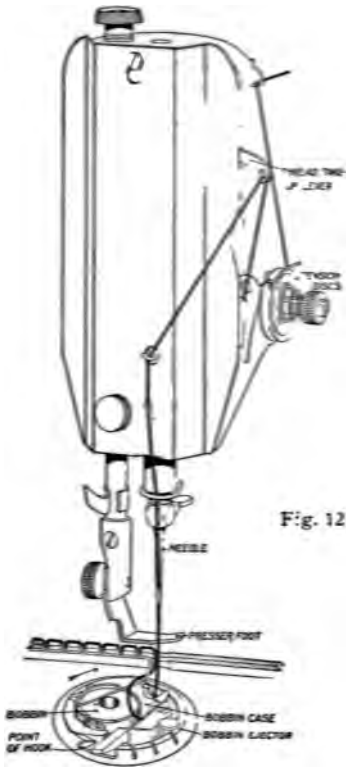


Fig. 12

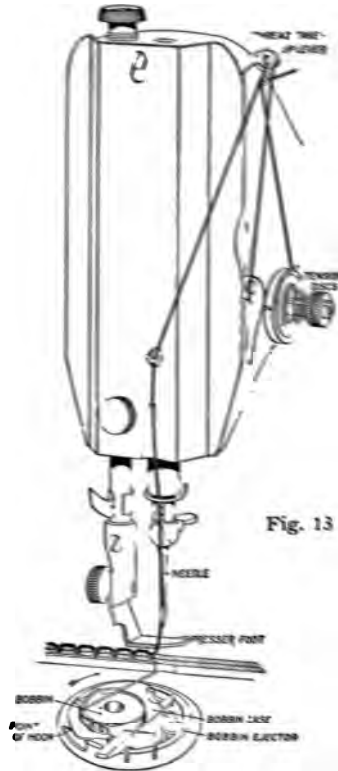


Fig. 13

OSCILLATING HOOK

Under Thread Enclosed by Needle Thread

Fig. 12 shows the third stage. The under thread has been enclosed by the needle thread, and the thread take-up lever is being raised to tighten the stitch.

Stitch Completed

Fig. 13 shows the stitch completed. The thread take-up lever has been raised to its highest point, drawing the needle thread, together with the under thread, into the middle of the fabric, the two threads now being locked. The tension on the needle thread is regulated by the circular tension discs shown in the illustrations, and the tension on the under thread is regulated by a spring on the bobbin case.

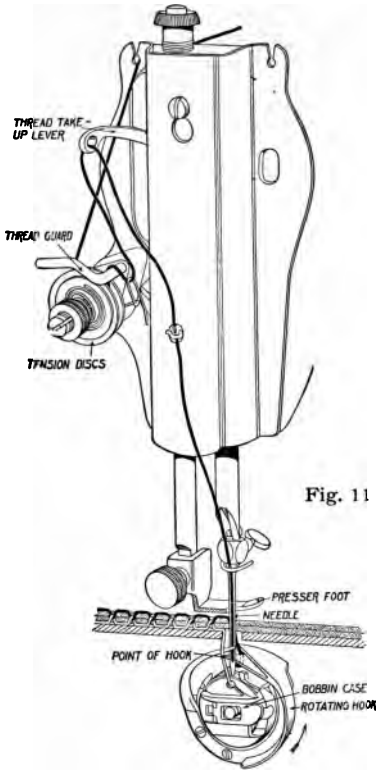


Fig. 11

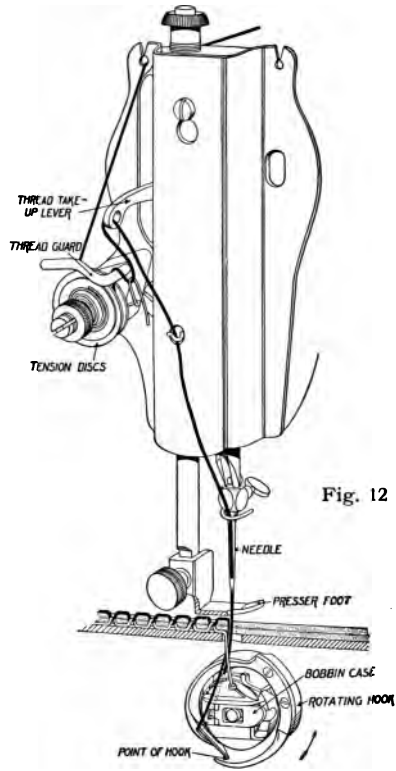


Fig. 12

ROTARY HOOK

Point of Hook Entering Loop of Needle Thread

Fig. 11 shows the first stage in stitch formation. The thread leading to the needle is loosened, because the thread take-up lever has begun its descent; the needle, after having descended to its lowest point, has been slightly raised and a loop of thread is thus formed which is immediately entered by the point of the hook, which rotates in one direction around the stationary bobbin case.

Loop of Needle Thread Enclosing Bobbin Case

Fig. 12 shows the second stage. The loop of needle thread has been taken by the point of the hook and is being passed around the bobbin case containing the bobbin of under thread, sufficient enlargement of the loop having been permitted by the descent of the thread take-up lever.

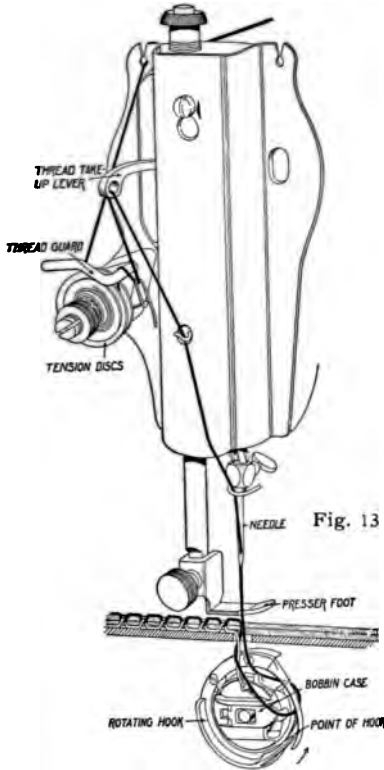


Fig. 13

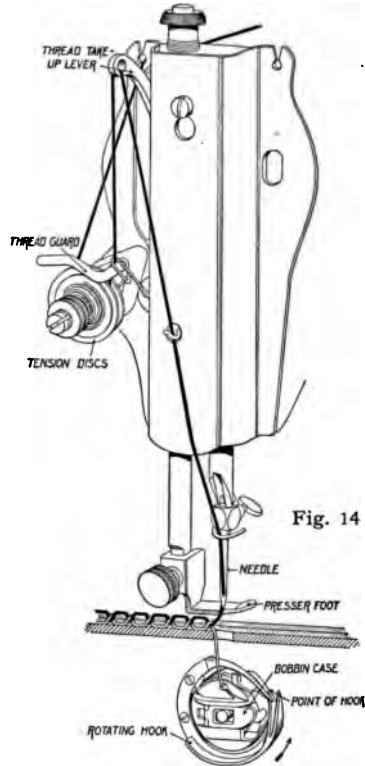


Fig. 14

ROTARY HOOK

Under Thread Enclosed by Needle Thread

Fig. 13 shows the third stage. The loop of needle thread has been cast off from the hook, the under thread has been enclosed by the needle thread, and the thread take-up lever is being raised to tighten the stitch.

Stitch Completed

Fig. 14 shows the stitch completed. The thread take-up lever has been raised to its highest point, drawing the needle thread, together with the under thread, into the middle of the fabric, the two threads now being locked. The tension on the needle thread is regulated by the circular tension discs shown in the illustrations, and the tension on the under thread is regulated by a spring on the bobbin case.