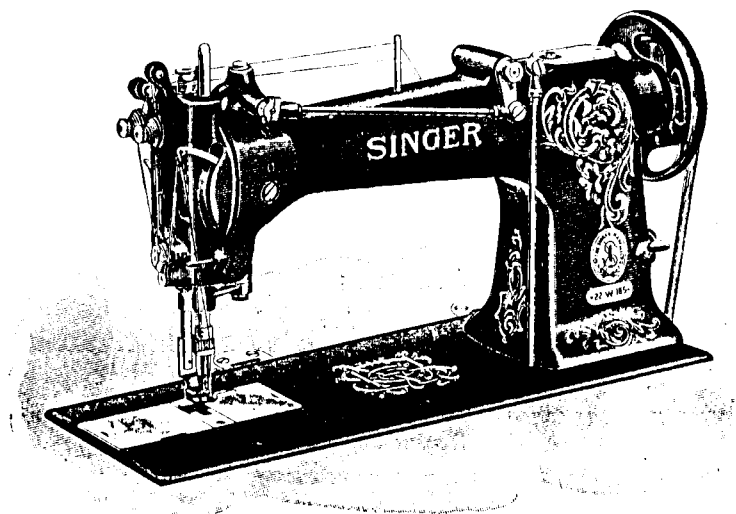


SINGER
21W

INSTRUCTIONS

FOR USING

SINGER SEWING MACHINES



Machine No. 22 w 165

Nos. 21 w 180, 21 w 182, 22 w 165 to 22 w 170,
22 w 172 and 22 w 173

COMPOUND FEED

THE SINGER MANUFACTURING CO.

COMPOUND FEED
MACHINES OF CLASSES
21 w and 22 w

DESCRIPTION

Compound Feed Machines of Classes 21 w and 22 w, Nos. 21 w 180, 21 w 182, 22 w 165 to 22 w 170, 22 w 172 and 22 w 173, have the needle hole in the feed dog for the needle to pass through the material into the feed dog and assist in feeding the several plies of material with such uniformity that they will be even at the end of a seam and at the same time draw sufficient under thread from the bobbin to set each stitch properly. A change in the length of stitch does not disturb their relative movements.

o 21 w 180 o

The specific designation of each Singer Sewing Machine consists of two numbers, separated by a hyphen or letter and stamped upon a number plate, which is attached to the machine, usually upon the arm.

The number before the hyphen or letter designates the **Class** to which the machine belongs, and the number after, the **Variety** of the machine in its Class.

When supplies for a machine are to be ordered and there is any uncertainty as to the correct numbers of needles or parts, the Class and Variety numbers of the machine, as shown on the number plate, should be given to ensure a correct understanding of the order.

Speed

The maximum speed recommended for compound feed machines Nos. 21 w 180, 21 w 182, 22 w 165 to 22 w 170, 22 w 172 and 22 w 173 is 1800 stitches per minute.

Run the machine somewhat slower than the maximum at first and increase the speed after the parts become thoroughly glazed by their action upon each other.

Needles

Needles for compound feed machines Nos. 21 w 180, 21 w 182, 22 w 165 to 22 w 170, 22 w 172 and 22 w 173 are of Class and Varieties 12 N 3 for sewing cloth, and 12 N 2 for sewing leather. These are made in sizes 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 22, 23 and 24.

The needle which is best adapted for the work that the machine is fitted to do is set in the machine at the factory.

The size number of the needle is marked upon its shank.

The Sizes. The size to be used should be determined by the size of the thread which must pass freely through the eye. If rough or uneven thread is used or if it passes with difficulty through the eye of the needle, the successful use of the machine will be seriously interfered with.

Orders for needles must specify the **quantity** required, the **size**, also the **class** and **variety** numbers separated by N.

The following are details of an intelligible order:

"100 No. 14 - 12 N 2 Needles."

"100 No. 16 - 12 N 3 Needles."

RELATIVE SIZES OF NEEDLES AND THREAD

NEW SIZE NOS. OF NEEDLES	FOR LEATHER		FOR CLOTH	
	COTTON	SILK	COTTON	SILK
9		OO	150	
10	70	O	100-150	OOO-OO
11	60	A	90-100	OO
12	50	B	80-90	O
13	40	C	70-80	A
14	36	D	60-70	A
15	30	D	50-60	B
16	30	E	40-50	C
18	24	EE	30-40	C
20	20		24-30	D
22	16		20-24	E
23	12		16-20	EE
24	8		8-16	

TWIST, LINEN AND COTTON THREAD AND NEEDLES

To make a smooth, even stitch with your sewing machine, use good, firmly twisted and smoothly finished thread, that passes freely through the eye of the needle. No other needles will give as good results and satisfaction as those recommended above.

In using slack twist or uneven silk, should it be frayed or roughened, the needle is too fine or too sharp, or has a hooked point, made by striking the feed dog. A hook may be easily honed off the needle.

For ordinary work use the same size of thread on the bobbin as in the needle.

Supplies of parts or needles for the machines can be purchased at any Singer Shop, or ordered by mail; money or a post office order covering their value, including postage, should be enclosed with the order, which will receive immediate attention, be promptly filled and forwarded by mail or express.

Ready wound bobbins for Singer Sewing Machines are sold by thread manufacturers.

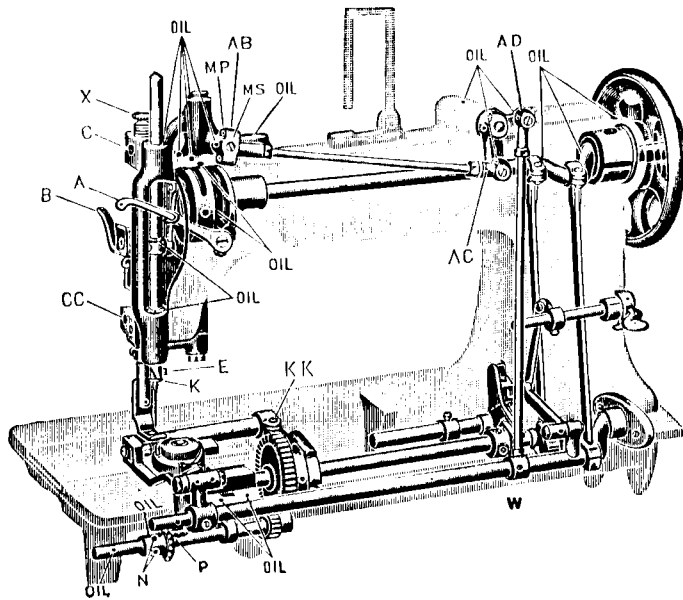


Fig. 2. Transparent View of Machine No. 21 w 180

To Oil the Machine

Good oil is the life of a machine, and should be regularly used on any surface of metal which comes in movable contact with another surface.

On top of arm (see Fig. 2) near the needle bar, are three holes; through the small one nearest the needle bar, oil the needle bar connecting link, when the bar is at its highest point, next turn the balance wheel until the needle bar is at its lowest point and oil through the second hole, into the groove in the take-up cam. Oil the needle bar frame position stud (upper). Oil the front arm shaft bushing through the oil packing thumb screw. Oil the needle bar frame driving crank connection bell crank stud on top of the arm and its pitman bearings. Oil the back arm shaft bushing through the small hole near the balance wheel. Move the arm cap aside and oil the arm shaft connections. Remove the face plate occasionally and oil the link, the

needle bar frame position stud (lower) and all movable parts. Tip the machine back to clean and oil all movable parts on the under side of the bed.

The hook should be given especial attention by the operator, as a drop of oil on the flange of the bobbin case is occasionally necessary.

Oil bearings at both ends of treadle, pitman and shaft, and all other movable parts of transmitter, etc.

After oiling take out the bobbin, run the machine rapidly for a minute and then wipe off all superfluous oil.

When a machine has been neglected or becomes gummed it should be soaked well with benzine and run for a short time, keeping all parts flooded with oil until it runs freely, then wipe thoroughly to remove all old oil and dirt and oil as before directed.

To Remove the Face Plate

See Figs. 2 and 3

Turn the balance wheel until take-up lever (A) is about half way up or down, then lower presser bar lifter (B), remove screws (C and CC), draw the lower end of the face plate outward and slide it downward until free. In replacing the face plate move it up while raising the presser bar lifter and replace screws (C and CC).

To Set a Needle

See Figs. 3 and 4

In a two needle machine, turn the balance wheel until the needle bar is at its highest point, insert the inside needle in the needle clamp with the short groove toward the inside hook, and insert the outside needle in the needle clamp with the short groove toward the outside hook.

In a single needle machine, insert the needle in the needle bar with the short groove toward the hook.

Be sure to push the needle as far up as it will go, then tighten the set screw firmly.

It may be necessary to turn the needle slightly to the right or left for some threads, if stitches are missed.

Operators are liable to use needles which are too fine. Better results usually follow the use of a larger size.

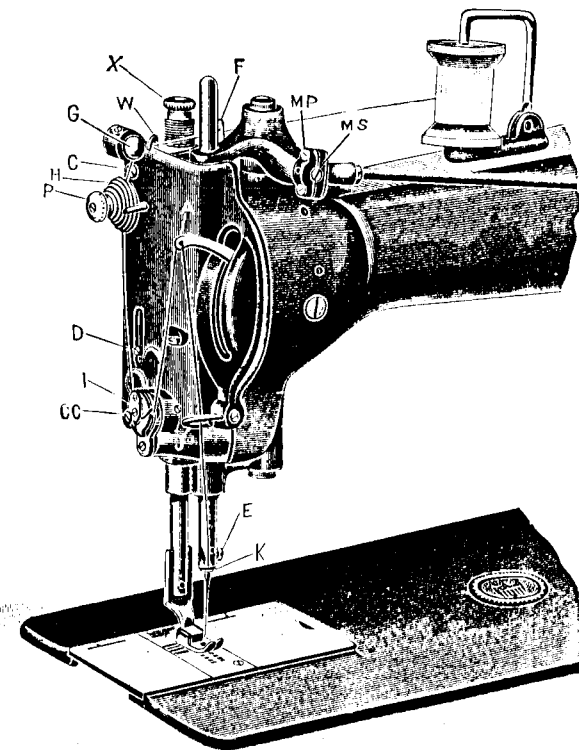


Fig. 3

To Thread the Needle

Place the spool of thread on the spool holder; pass the thread through the eye of thread leader (F, on the front part of the head), then under face plate thread guide (W), up over thread retainer (G), down between tension discs (H), around under thread controller (I), up through take-up lever (A), down through thread guide (J, on front of the face plate) out through needle bar thread guide (K, attached to the bottom of the needle bar) and from the left to right through the eye of the needle.

Roller Presser

For convenience in threading the needle, press down on the roller and swing it to the left.

To Thread Two Needle Machines

The thread leading from the tension discs (back) under the thread controller is passed through the upper hole in the take-up lever and down through the inside guides and needle toward the inside hook.

The outside needle is threaded from the right toward the outside hook.

To Remove the Bobbin

Remove the bed slide, lift up the latch (see Fig. 4) and remove the bobbin.

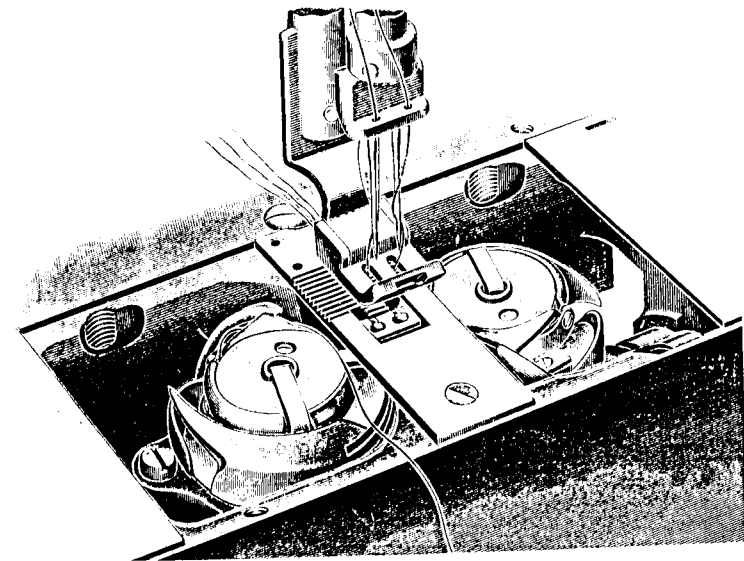


Fig. 4. Machine No. 22 w 165

Showing how to Thread the Bobbin Case

Turn the balance wheel until the point of the hook moves away from the bobbin case tension spring, then place the bobbin in the bobbin case with the thread drawing in the direction that the hook runs and draw the thread into the slot (see Fig. 4) and under the tension spring.

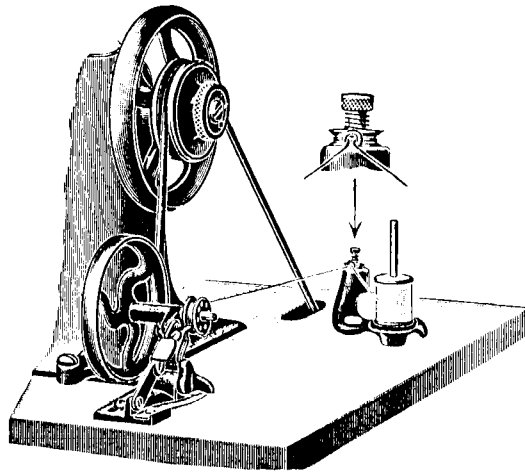


Fig. 5

To Wind the Bobbin Automatically While Sewing

Lead the thread from the spool under the guide wire, between the tension discs and again under the guide wire as shown in Fig. 5; connect the thread with the bobbin on the bobbin winder, push the bobbin winder up against the belt and as the machine sews the bobbin will be filled and thrown out of action automatically.

The bobbin winder should be placed so that the pulley will drop away from the belt when the bobbin is sufficiently filled.

The tension stud should be set at least nine inches on a direct line from the bobbin so that the thread will traverse evenly across the bobbin. If it does not, swing the spool holder to the right or left until the bobbin fills evenly.

See that the stop latch is set so that the bobbin will not fill more than three layers from its top edge before throwing the bobbin winder out of action.

Knee Lifter

The knee lifter is used for raising the presser foot by knee pressure against the knee plate, leaving both hands free to manipulate the work. If the knee lifter does not raise the presser

foot satisfactorily, adjust the rod in the rock lever which connects with the rod in the arm of the machine to lift the presser foot.

To Commence Sewing

With the left hand take hold of the needle thread, leaving it slack between the hand and the needle, turn the balance wheel toward you until the needle moves down and the take-up lever rises to its highest point, thus catching the bobbin thread; draw up the needle thread and the bobbin thread with it through the needle hole in the feed dog and lay both threads back across the feed dog (see Fig. 6), then place the material beneath the needle and lower the presser foot upon it, turn the balance wheel toward you and commence to sew.

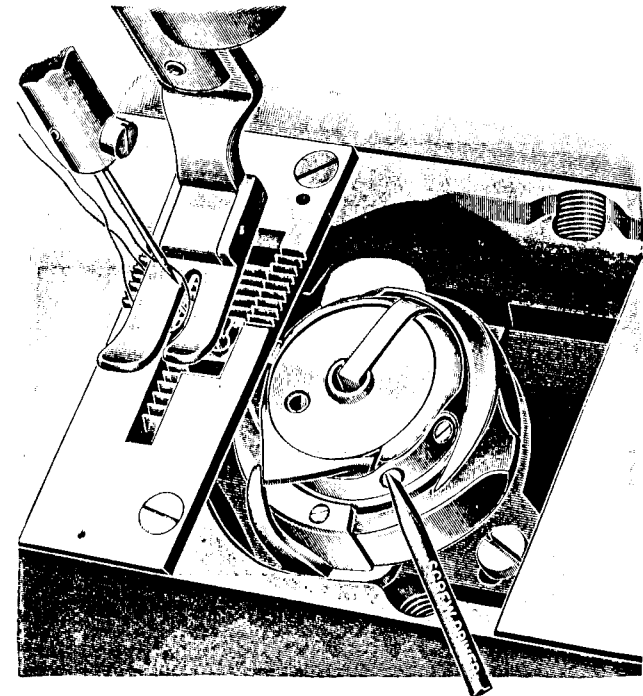


Fig. 6. Machine No. 21 w 180

Showing how to Adjust the Bobbin Case Tension

The Tensions

To regulate the tensions, please observe the following:



Fig. 7

The upper and under threads should lock in the center of the material as shown in Fig. 7.

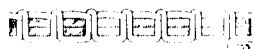


Fig. 8

If the upper thread is held too tightly by its tension, or if the under thread is too loose, the thread will be straight along the upper surface of the material as shown in Fig. 8.



Fig. 9

If the under tension is too tight or the upper too loose, the thread will be straight along the under side of the material, as shown in Fig. 9.

The tension on the under thread is changed by a very slight turn of the bobbin case tension regulating screw at the center of the spring on the bobbin case in the hook (see Fig. 6), turning it to the right tightens and to the left loosens the under tension.

Correctly made stitches, as shown in Fig. 7, can usually be obtained by regulating the upper tension only; turn tension thumb nut (P, see Fig. 3) toward you to tighten and from you to loosen the tension.

Caution. Do not try to adjust the upper tension when the presser foot is up, as the tension is then loose.

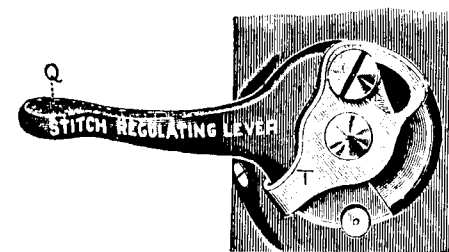


Fig. 10

To Regulate the Length of Stitch

Raise feed regulating handle (Q) to shorten and lower it to lengthen the stitch.

Moving lever (Q) changes the throw of the needle and movement of the feed dog without disturbing their relative positions.

If the stitch changes length while the machine is running, tighten the screw which shows under handle (Q).

The Pressure on the Material

The pressure of the presser foot or of the roller presser should be only heavy enough to prevent the work from rising with the needle; if too heavy it will be of no benefit.

The pressure is regulated by turning presser bar thumb screw (X, see Fig. 3) at the top of the arm head through which the presser bar passes.

To Remove the Work

Have the take-up lever at its highest point, raise the presser foot, draw the work back and to the left about three inches, then cut the threads near the work.

For convenience in taking out the work, the tension of the upper thread is released by raising the presser foot with the lifter, but is not released by thick goods or seams passing under the presser foot.

Roller Presser

The roller should be set close enough to the needle to steady it and prevent it from staggering, and far enough back to prevent the leather from stretching.

Causes of the machine not working properly will usually be found in the tension not being correctly adjusted, or its dises may be clogged with lint or knots of thread, or the thread may be too coarse or too fine for the needle, or the needle and thread too coarse or too fine for the feed dog, or the needle bent or blunt. See that a straight needle is pushed up in the needle bar as far as it should go; any particle of lint or dirt which prevents it from going up can be removed through the cross hole in the needle bar.

INSTRUCTIONS FOR ADJUSTERS AND MACHINISTS

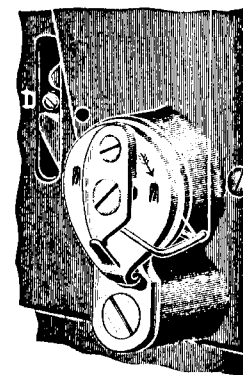


Fig. 11

Thread Controller

The function of the thread controller spring is to hold back the slack of the upper thread until the eye of the needle reaches the goods in its descent.

The thread controller stop is in the form of a crescent; push on the upper end of the stop for less controller action and on the lower end for more controller action on the thread.

It may be found advisable to increase the tension of the spring for coarse thread, or to lessen it for fine thread.

To vary the tension of the thread controller spring, remove the face plate and loosen the small set screw (see Fig. 11) at the right of the controller, which sets the thread controller stud, then from the inside turn the stud forward or backward as required, and retighten the set screw. In any case when an unusually light tension is used, the tension on the spring should be correspondingly light. The coils of the spring should be oiled occasionally.

To Place a New Thread Controller in Position. Remove the entire thread controller by taking out the largest screw (see Fig. 11) and release the spring by removing the middle screw. (Be careful not to lose the small roller.) Place the new spring, the roller and screw in their positions. Next put the entire thread controller on the face plate, taking care to slide the little tail, on the coil of the spring, into the notch in the stud over which the coil slides.

Oil the small roller occasionally.

To Raise or Lower the Feed Dog

Tip the machine back and turn the balance wheel toward you until the feed dog is at its highest position. Loosen the feed lifting cam fork pinch screw (KK, see Fig. 2), move the rock shaft up or down until the feed dog is at the desired height and retighten the screw.

Remove the throat plate occasionally and clean the lint and dirt from between the rows of teeth on the feed dog.

Relative Position of the Needle Bar, Presser Bar and Feed Dog. The needle should enter the feed dog throat hole centrally; if it does not, adjust the feed dog.

The needle and presser bars should be $\frac{5}{8}$ inch apart when the feed is shut off (no movement of the goods). If they are not, loosen the two screws in the needle bar frame driving crank above "w" (see Fig. 2) and change the adjustment until the needle and presser bars are $\frac{5}{8}$ inch apart.

To Set the Needle Bar

The needle bar which is in the machine when shipped from the factory has upon it (about two inches from the bottom) two lines $\frac{3}{2}$ inch apart. When the needle bar is at its lowest position the upper mark should be just visible at the bottom of the needle bar frame.

To Set a New Needle Bar Which Has no Mark. Set the needle bar so that when it rises $\frac{3}{2}$ inch from its lowest position, the point of the hook will be at the center of the needle and about $\frac{1}{16}$ inch above the eye.

To change a machine fitted with a 12 N to use a 6 N needle, it is necessary to set the needle bar $\frac{3}{16}$ inch higher, as the 6 N are $\frac{3}{16}$ inch longer than the 12 N needles.

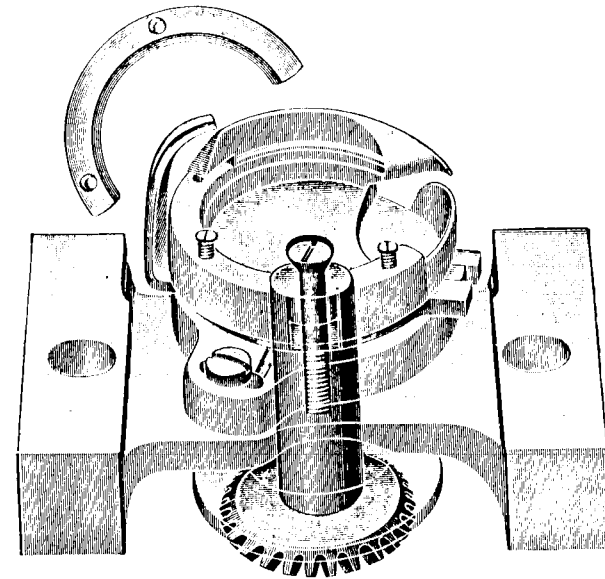


Fig. 12. Hook Saddle for Compound Feed Machines of Class 21 w
For Sewing Cloth

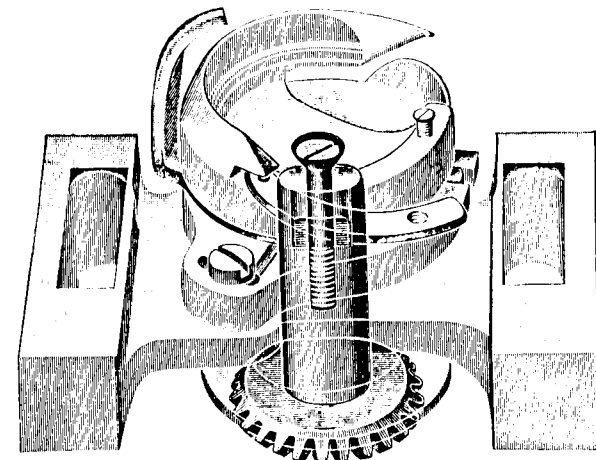


Fig. 13. Hook Saddle for Compound Feed Machines of Class 22 w
For Sewing Leather

Transparent views (see Figs. 12 and 13) of the hook saddles showing the hook and screw No. 200555H passing down into

the gear socket, binding the hook and socket together, also showing the long-beak hook for leather work and the screw at the left of the gear for adjusting the position of the bobbin case lever.

The bobbin case opening lever, actuated by the eccentric on the hook washer, strikes the projection on the bobbin case and turns it slightly, making an opening between the bobbin case stop and the stop on the throat plate when the thread is across the bobbin case and passing between the stops. The bobbin case lever may be adjusted by loosening the bobbin case lever fulcrum screw and moving the fulcrum forward or backward, but the fulcrum should not cause the bobbin case lever to move far enough to make a bind between the stop on the throat plate and the bobbin case lever.

To Time the Hook

Set the feed regulating handle for stitches $\frac{1}{16}$ inch long, then remove the throat plate and turn the balance wheel toward you until the needle bar has passed its lowest point and risen so that the lower mark on it is even with the bottom of the needle bar frame. If in correct time, the point of the hook will be at the center of the needle and $\frac{1}{16}$ inch above its eye. If it is not, loosen screws (N, see Fig. 2) and turn gear (P) forward or backward until the point of the hook is at the center of the needle, then retighten the screws (N).

To Adjust the Hook To and From the Needle

If the hook runs too far from or too near the needle, loosen the hook saddle screws just enough to permit the saddle to be driven with light blows to the position desired, and retighten the hook saddle screws.

Needle Guard

The needle guard which is part of the hook washer should stand out far enough to prevent the point of the hook from striking the needle, but not out far enough to prevent the point of the hook from catching the loop. Bend the needle guard slightly to adjust it.

To Change the Gauge of a Machine

Change the needle holder, throat plate, feed dog and presser foot. Loosen the screws which hold the hook saddles, move the saddles until the points of the hooks run as close to the needles as they can without striking, then time the hook as directed above.

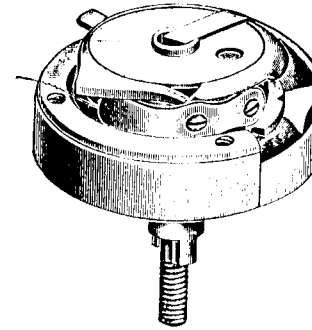


Fig. 14
Hook and Bobbin Case

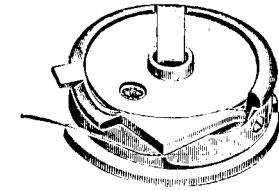


Fig. 15
Bobbin Case
Removed from the Hook

To Remove the Hook from the Machine

See Figs. 12 and 13

Remove the hook gib screws and move the gib aside to allow the base of the bobbin case to be taken out, after which remove the screw, shown in the illustration, from the center of the hook. Tapping the hook lightly on the bottom of its rim will force it from its socket. Do not try to pry it out, as prying may bend the shank of the hook. In replacing the hook, be sure that the prongs of the shank properly enter the slot at the bottom of the socket, otherwise the hook will be out of time.

To Remove the Arm Shaft

Through the large hole near the presser bar, loosen the set screw and remove the check and position screws from the take-up cam; detach the arm shaft connections from the upper cranks, remove the balance wheel, loosen the arm shaft bushing (back) position screw and drive the bushing out, then draw out the arm shaft.

Take-up Cam and End Play of Shaft

When replacing the arm shaft bushings, see that the grooves are in line for the position screws to enter, and tighten the screws. When setting the take-up cam be sure to replace its position screw in the hole nearest the presser bar when the screw holes are uppermost, then turn the position screw firmly down into the shaft and set the check screw tightly upon it. The end play of the upper shaft is taken up by means of the screw in the end of the shaft at the balance wheel.

Balance Wheel

The balance wheel is counter balanced to prevent excessive vibration of the machine and the shaft is grooved for the position screw to enter and correctly locate the counter balance.

Place the balance wheel on the shaft so that the screw farthest from you will enter the groove in the shaft.