

# **SINGER**

**245-1, -2, -3**

# USE ONLY SINGER OILS and LUBRICANTS

*They insure freedom from lubricating trouble and  
give longer life to sewing equipment*

## "Singer Oil for High Speed Sewing Machines" (Cloth and Leather)

For all manufacturing sewing machines except where a stainless oil is desired.

## "Singer Stainless Oil for High Speed Sewing Machines"

For all manufacturing sewing machines where a stainless oil is desired.

## "Singer Motor Oil"

For oil-lubricated motors, power tables, transmitters and machinery in general.

## "Singer Stainless Thread Lubricant"

For lubricating the needle thread of sewing machines for stitching fabrics or leather where a stainless thread lubricant is required.

*NOTE: All of the above oils are available in 1 quart, 2 quart, 1 gallon and 5 gallon cans or in 55 gallon drums, and can also be supplied in customer's containers.*

## "Singer Gear Lubricant"

This specially prepared grease is recommended for gear lubrication on manufacturing sewing machines.

## "Singer Ball Bearing Lubricant"

This pure grease is specially designed for the lubrication of ball bearings and ball thrust bearings of motors and electric transmitters, ball bearing hangers of power tables, etc.

*NOTE: The above greases are furnished in 1 lb. and 4 lb. tins*

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# INSTRUCTIONS

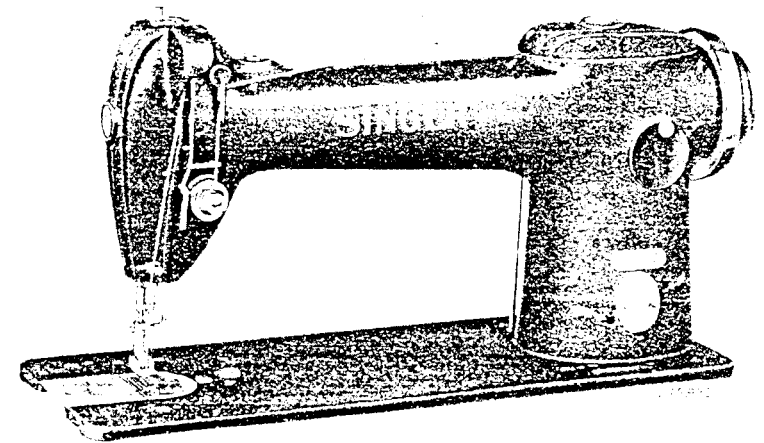
FOR USING AND ADJUSTING

# SINGER SEWING MACHINES

## 245-1, 245-2 and 245-3

SINGLE NEEDLE

LOCK STITCH



# THE SINGER MANUFACTURING CO.

## DESCRIPTION

Singer Class 245 is a high speed, single needle, lock stitch machine with spiral bevel gears, grease lubricated through Alemite-Zerk fittings.

The following list shows the class of work handled and other details of the three varieties of this class:

Machine	Class of Work	Stitches per inch	Needle Bar Stroke	Presser Bar Lift
245-1	Light and Medium Weight	7 to 30	1 9/64"	9/32"
245-2	Medium and Medium Heavy	5½ to 30	1 13/64"	5/16"
245-3	Heavy and Extra-Heavy	5½ to 30	1 15/32"	3/8" *

\*Optional 7/16"

SPEED - 3500 stitches per minute depending upon the nature of the material.

To all whom it may concern:

The placing or renewal of the name "Singer" (Reg. U. S. Pat. Off.) or any of the trade marks of The Singer Manufacturing Company on any machine that has been repaired, rebuilt, reconditioned, or altered in any way whatsoever outside a Singer factory or an authorized Singer agency is forbidden.

Genuine Singer Needles should be used in Singer Machines. These Needles and their Containers are marked with the Company's Trade Mark "SIMANCO." 1

Needles in Containers marked "For Singer Machines" are not Singer made needles. 2

## LUBRICATION

Use only Singer "OIL FOR HIGH SPEED SEWING MACHINES (CLOTH AND LEATHER)" for general use, or "STAINLESS OIL FOR HIGH SPEED SEWING MACHINES" where a stainless oil is desired.

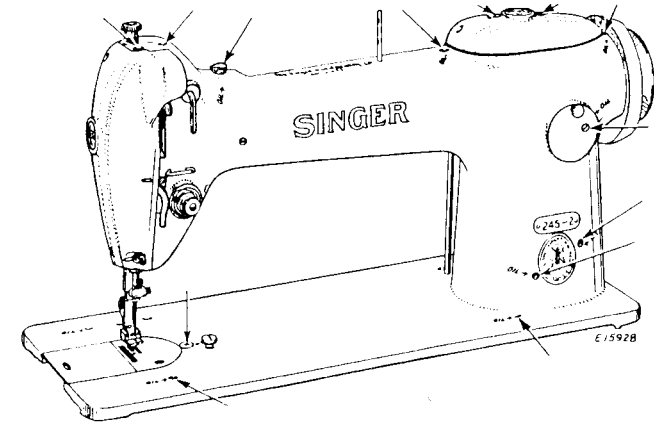


Fig.2. Front View of Class 245 Machine - Oiling Points

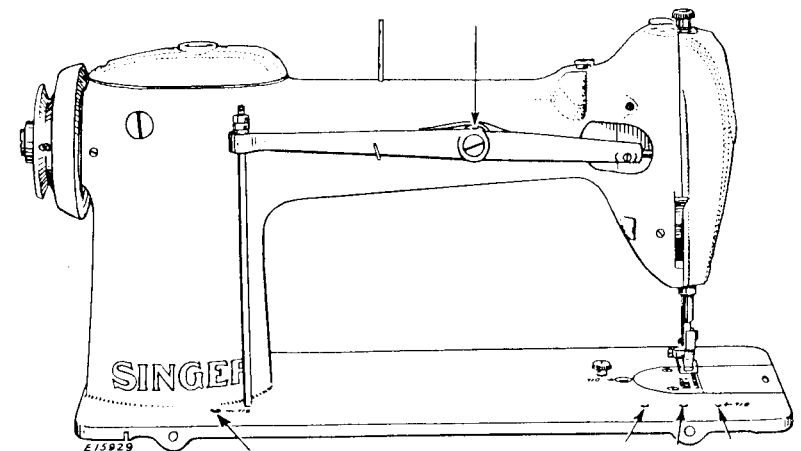


Fig.3. Rear View of Class 245 Machine - Oiling Points

Apply oil through all oil holes indicated by the unlettered arrows in Figs. 2, 3 and 6 and, when used continuously, the machine should be oiled at least four times daily.

Keep all wicking saturated with oil.

When the machines leave the factory, the gear cases are packed with sufficient Singer Gear Lubricant for approximately 160 hours of operation. Every 160 hours of operation thereafter, replenish the gear cases (B, Fig. 4) and (F, Fig. 5) with Singer Gear Lubricant (marked for use with

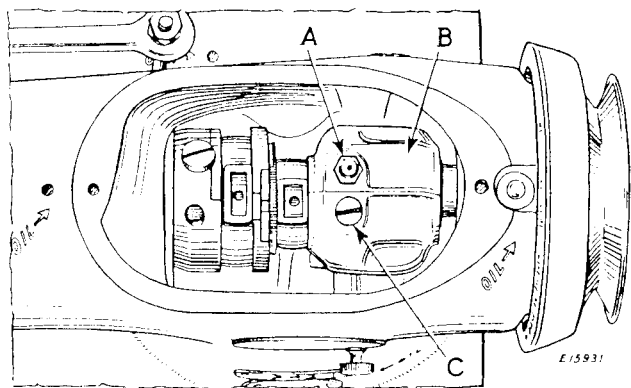


Fig. 4. Top View, Arm Top Cover Removed. Upper Gear Case Lubrication. Class 245 Machines), using, for this purpose, Singer Grease Gun 121587 (3 oz. capacity) or Singer Grease Gun 121588 (1/2 lb. capacity). These

grease guns are supplied on order at extra charge. Take out the two screws which fasten the arm top cover to the machine arm and remove the level hole screw (C, Fig. 4). After making certain that the lubricant is issuing from the grease gun, apply lubricant through the grease fitting (A, Fig. 4). Do not overfill the gear case, nor apply enough to cause it to emerge from the hole at (C). The quantity can be roughly checked by observation through the hole at (C). Replace screw (C) and arm top cover.

Lay the machine back on its rear side and remove level hole screw (D, Fig. 5) and apply lubricant through grease fitting (E, Fig. 5) in

the same manner and in the same quantity as for gear case (B, Fig. 4).

**CAUTION:** To avoid overfilling the gear cases, do not turn the balance wheel while applying grease through these grease fittings.

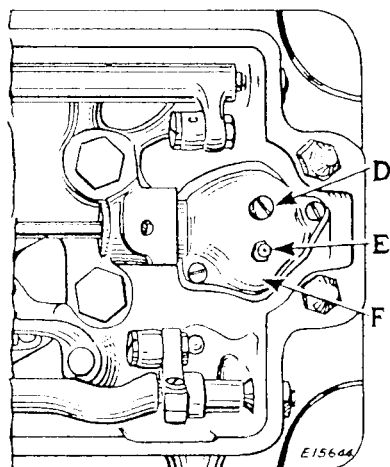


Fig. 5. Lower Gear Case Lubrication.

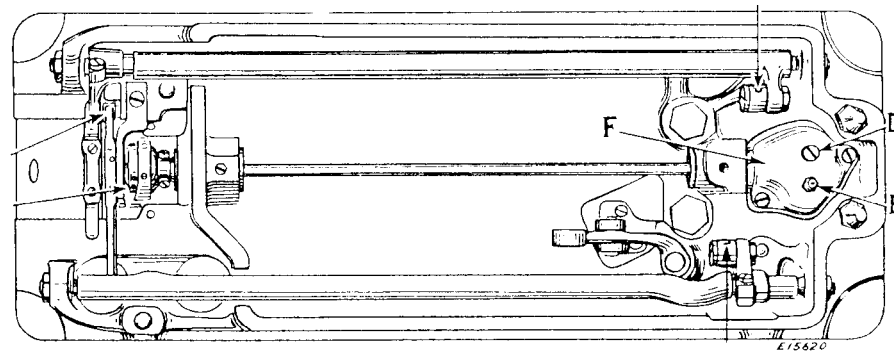


Fig. 6. Oiling Points in Machine Bed.

At least four times each day apply ONE DROP of oil to the bobbin case holder bearing in the sewing hook race, as shown in Fig. 7.

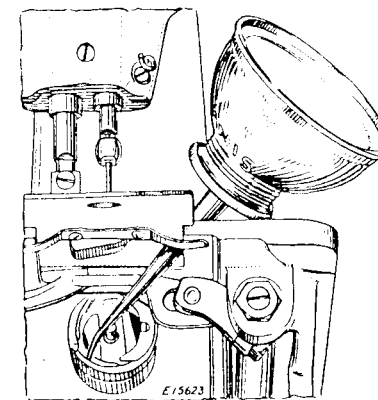


Fig. 7. Oiling Point in Hook Race.

**CAUTION:** Never oil the sewing hook race through the needle hole in the throat plate, nor flood the hook with oil.

## Needles

Needles for these machines are as follows:

Machine	Class and Variety	Sizes
245-1	88x9	8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
245-2 and 245-3	16x257	8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 19, 21
245-3 with 7/16" presser bar lift	16x261	13, 14, 16, 17, 18, 19, 21

The above needles are regularly nickel finish but are available with chromium finish if ordered.

The size of the needle to be used is determined by the size of the thread which must pass freely through the eye of the needle. Rough or uneven thread, or thread which passes with difficulty through the eye of the needle, will interfere with the successful use of the machine.

Orders for needles must specify the QUANTITY required, the SIZE NUMBER, also the CLASS and VARIETY NUMBERS separated by an x.

The following is an example of an intelligible order:

"100 No. 16, 88x9 Needles

50 No. 18, 16x257 Needles"

The best stitching results will be obtained with needles furnished by the Singer Sewing Machine Company.

## Thread

Left twist thread should be used in the needle. Either right or left twist thread can be used in the bobbin.

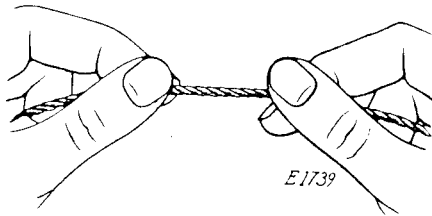


Fig. 8. How to Determine the Twist

Hold the thread as shown above. Turn the thread over toward you between the thumb and forefinger of the right hand; if left twist, the strands will wind tighter; if right twist, the strands will unwind.

## Relative Sizes of Needles and Thread

The following sizes of needles and thread are recommended according to the class of work:

Sizes of Needles	Classes of Work	Sizes of Cotton, Linen or Silk
14	Shirtings, Sheetings, Calicoes, Muslins, Silks, Dress Goods and all classes of general work.	60 to 80 Cotton A and B Silk
16 and 17	All kinds of heavy Calicoes, light Woolen Goods, heavy Silk, Seaming, Stitching, etc.	40 to 60 Cotton C Silk
18	Tickings, Upholstery, Woolen Goods, Trousers, Boys' Clothing, Cloaks, etc.	30 to 40 Cotton D Silk
19	Heavy Woolens, Tickings, Bags, Heavy Coats, Trousers, Heavy Clothing, generally.	20 to 30 Cotton E Silk 60 to 80 Linen
21	Bags, Coarse Cloths and Heavy Goods.	18 to 20 Cotton 40 to 60 Linen

## Hints for Perfect Operation

The balance wheel must always turn over toward the operator. Do not run the machine with the presser foot resting on the feed without cloth under the presser foot.

Do not run the machine when both bobbin case and needle are threaded unless there is material under the presser foot.

Do not try to help the machine by pulling the fabric lest you bend the needle. The machine feeds the work without assistance.

The slide over the bobbin case should be kept closed when the machine is in operation.

Do not press on the knee lifter lever while the machine is in operation, as this might prevent the work from feeding properly.

NEVER TOUCH THE STITCH REGULATOR PLUNGER WHEN THE MACHINE IS RUNNING.

## To Remove the Bobbin

Turn the balance wheel over toward you until the needle moves up to its highest position. Draw out the slide in the bed of the machine.

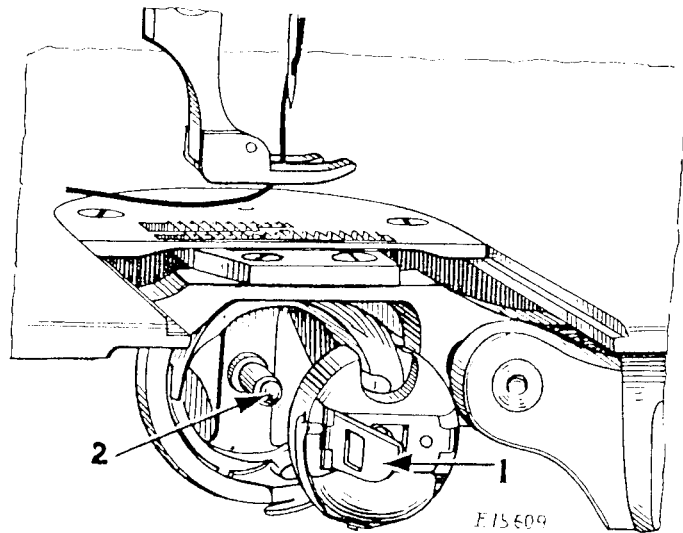


Fig. 9. Removing the Bobbin.

Open the bobbin case latch (1, Fig. 9) and, by means of this latch, remove the bobbin case from the sewing hook.

While the latch remains open, the bobbin will be retained in the bobbin case. Release the latch, turn the open end of the bobbin case downward and the bobbin will drop out.

## To Wind the Bobbin

(See Fig. 10)

Fasten the bobbin winder to the table with its driving pulley in front of the machine belt, so that the pulley will drop away from the belt when sufficient thread has been wound upon the bobbin.

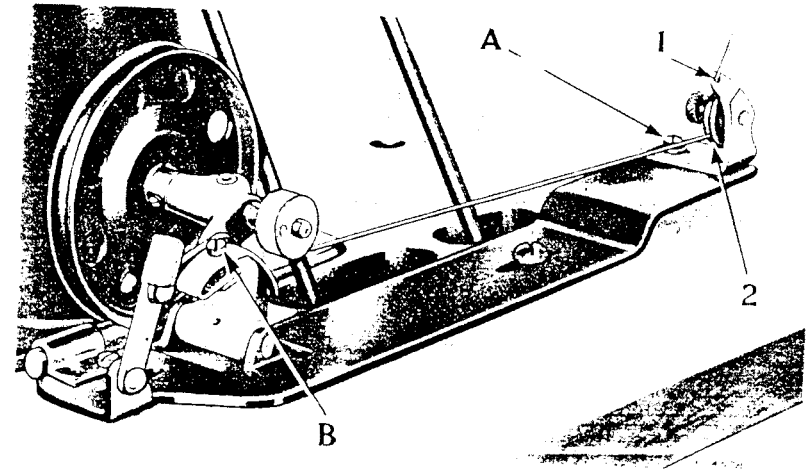


Fig. 10. Winding the Bobbin.

Place the bobbin on the bobbin winder spindle and push it on as far as it will go.

Pass the thread down through the thread guide (1) in the tension bracket, around the back of, and between, the tension discs (2). Then wind the end of the thread around the bobbin a few times, push the bobbin winder pulley over against the machine belt and start the machine.

When sufficient thread has been wound upon the bobbin, the bobbin winder will stop automatically.

If the thread does not wind evenly on the bobbin, loosen the screw (A) in the tension bracket and move the bracket to the right or left as may be required, then tighten the screw.

The amount of thread wound on the bobbin is regulated by the screw (B). To wind more thread on the bobbin, turn the screw (B) inward. To wind less thread on the bobbin, turn this screw outward.

Bobbins can be wound while the machine is stitching.

## To Thread the Bobbin Case

Hold the bobbin between the thumb and forefinger of the right hand, as shown in Fig. 11, the thread drawing on the bottom from the left toward the right.



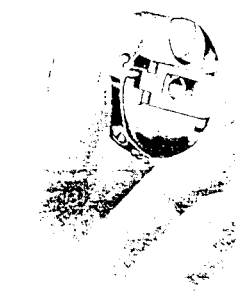
Fig. 11

With the left hand, hold the bobbin case as shown in Fig. 11, the slot in the edge being near the top, and place the bobbin into it.



Fig. 12

Then pull the thread into the slot in the edge of the bobbin case as shown in Fig. 12, draw the thread under the tension spring and into the delivery eye at the end of the tension spring (see Fig. 13).



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Fig. 13

## To Replace the Bobbin Case

After threading, take the bobbin case by the latch and place the bobbin case on the center stud (2, Fig. 9) of the bobbin case holder;

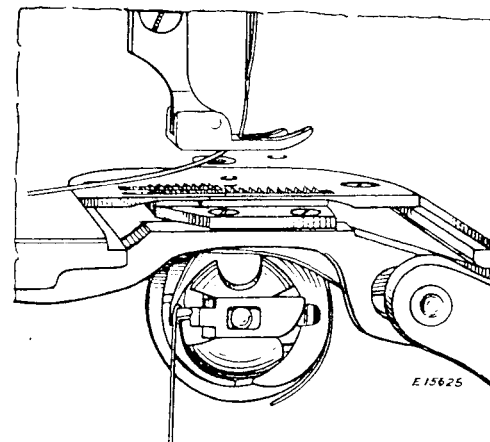


Fig. 14. Bobbin Case Threaded and Replaced

release the latch and press the bobbin case back until the latch catches the groove near the end of the stud (see Fig. 14). Allow about two inches of thread to hang free, and replace the slide in the bed of the machine.

## To Set the Needle

Turn the balance wheel over toward you until the needle bar moves up to its highest position; loosen the screw in the lower end of the needle bar and put the needle up into the bar as far as it will go, with the long groove of the needle toward the left and the eye of the needle directly in line with the arm of the machine, then tighten the screw.

## Upper Threading

Pass the thread from the unwinder, or from the pin on the top of the machine, from right to left through the top hole (1) in the

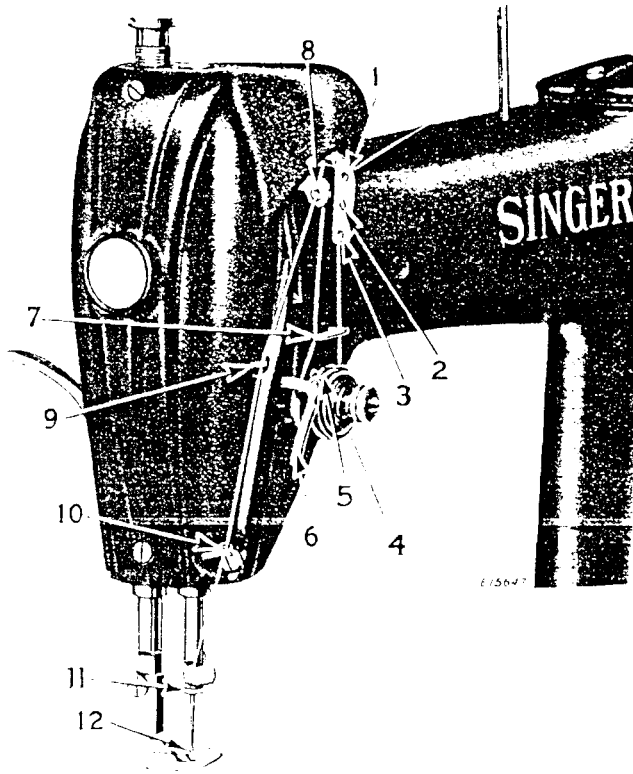


Fig. 15. Upper Threading - Machines 245-2 and 245-3

thread retainer, from left to right through the center hole (2) in the thread retainer, and from right to left through the bottom hole (3) in the thread retainer, down under and from right to left between the tension discs (4), into the thread take-up spring (5), under the slack thread regulator (6), up and back of the wire thread guide (7), up and from right to left through the hole in the end of the thread take-up lever (8), down through the thread guide (9), down through the thread eyelet (10), down through guide (11) on the needle clamp,

and from left to right through the eye (12) of the needle. Draw about two inches of thread through the needle eye with which to commence sewing.

NOTE - Upper threading for Machine 245-1 is the same as the foregoing except that the needle bar for this machine is not provided with a needle clamp, and the guide (11) is on the lower end of the needle bar bushing.

## To Prepare for Sewing

With the left hand, hold the end of the needle thread, leaving it slack from the hand to the needle, turn the balance wheel over

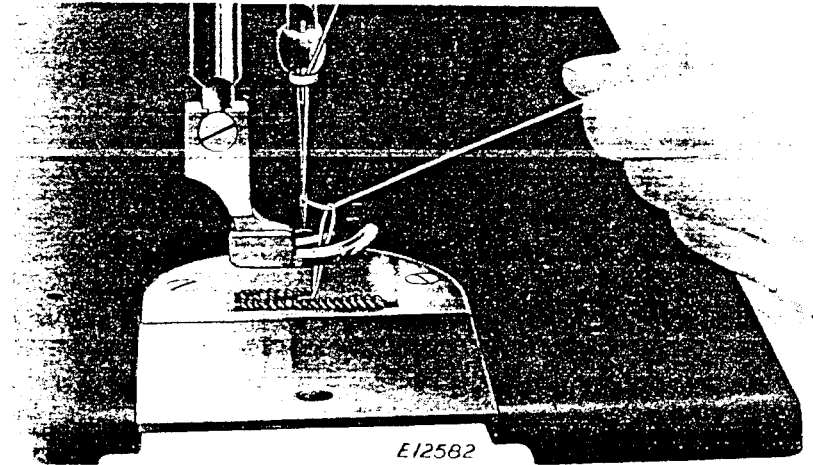


Fig. 16. Drawing Up the Bobbin Thread

toward you until the needle moves down and up again to its highest position, thus catching the bobbin thread; draw up the needle thread and the bobbin thread will come up with it through the hole in the throat plate (see Fig. 16). Lay both threads back under the presser foot.



### To Commence Sewing

Place the material beneath the presser foot, lower the presser foot and commence to sew, turning the balance wheel over toward you.

### To Remove the Work

Let the thread take-up lever rest at its highest position, raise the presser foot, draw the work back and cut the threads close to the goods.

### Tensions

For ordinary stitching, the needle and bobbin threads should be locked in the center of the thickness of the material, thus:



Fig.17. Perfect Stitch

If the tension on the needle thread is too tight, or if that on the bobbin thread is too loose, the needle thread will lie straight along the upper surface of the material, thus:



Fig.18. Tight Needle Thread Tension

If the tension on the bobbin thread is too tight, or if that on the needle thread is too loose, the bobbin thread will lie straight along the under side of the material, thus:



Fig.19. Loose Needle Thread Tension

### To Regulate the Tensions

THE TENSION ON THE NEEDLE THREAD SHOULD BE REGULATED ONLY WHEN THE PRESSER FOOT IS DOWN. Having lowered the presser foot, turn the small thumb nut at the front of the tension discs over to the right to increase the tension. To decrease the tension, turn this thumb nut over to the left.

The tension on the bobbin thread is regulated by the large screw (L, Fig.11) in the tension spring on the outside of the bobbin case. To increase the tension, turn this screw over to the right. To decrease the tension, turn this screw over to the left.

When the tension on the bobbin thread has been once properly adjusted, it is seldom necessary to change it, as a correct stitch can usually be obtained by varying the tension on the needle thread.

### To Regulate the Pressure on the Material

The pressure on the material is regulated by the thumb screw (M, Fig.20). To increase the pressure, turn this thumb screw over to

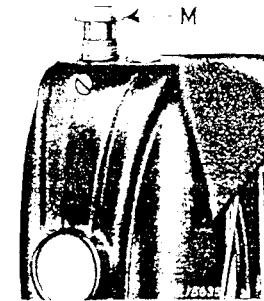


Fig.20. Regulating Pressure on the Material

the right. To decrease the pressure, turn this thumb screw over to the left.

## To Regulate Length of Stitch

To change stitch length, press the plunger (N, Fig. 21) and turn the balance wheel slowly, by hand, until the plunger drops into a notch in

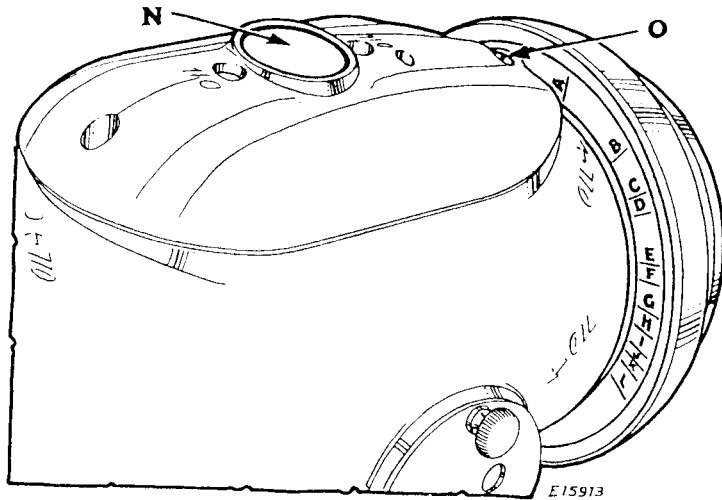


Fig. 21. Stitch Regulator

the feed eccentric. Then turn the wheel forward or backward to increase or decrease the length of stitch which is indicated by the letters on the indicator plate being opposite the screw at (O).

The indicator plate is lettered from "A" to "L" inclusive. The stitches are longer as the letter "A" is approached, and shorter as the setting approaches the letter "L".

When the desired setting is obtained, release the plunger.

**CAUTION** - Never press the plunger (N) while the machine is running.

## THE IMPORTANCE OF USING GENUINE SINGER PARTS AND NEEDLES IN SINGER MACHINES

The successful operation of Singer machines can only be assured if genuine Singer parts and needles are used. Supplies are available at all Singer Shops for the Manufacturing Trade and mail orders will receive prompt attention.

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## INSTRUCTIONS FOR ADJUSTERS AND MECHANICS

## To Adjust the Thread Take-up Spring

The thread take-up spring (R, Fig. 22) should be set so that when the eye of the needle reaches the goods on the downward stroke of

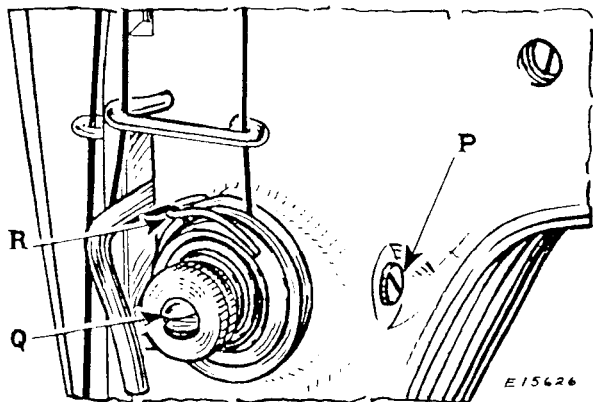


Fig. 22. Adjustment of Thread Take-up Spring

the needle bar, the spring will be through acting and will rest against the stop on the thread take-up spring regulator. If the thread take-up spring is not correctly set, as instructed above, loosen the set screw (P, Fig. 22) in the arm of the machine, and turn the tension stud (Q, Fig. 22) to the right for more movement of the spring or to the left for less movement. When the spring is correctly set, securely tighten the set screw (P).

The tension on the thread take-up spring (R) is regulated by turning the tension stud (Q) to the right to increase the tension, or to the left to decrease the tension. The tension on the thread take-up spring should be just sufficient to take up the slack of the needle thread until the eye of the needle reaches the goods in its descent.

## Feed Eccentric Stop Screws

The machine is prevented from making longer stitches than a predetermined maximum by the stop screw (S, Fig. 23) in the feed eccentric.

Feed eccentric stop screw 140256, furnished with Machine 245-1, permits a maximum length of seven stitches per inch. Stop screw 140258, for 14 stitches per inch or shorter, can also be used. Machine 245-2 and 245-3 are regularly fitted with stop screw 140257 permitting a maximum length of  $5\frac{1}{2}$  per inch, but either 140256 (7 per inch) or 140258 (14 per inch) can be used.

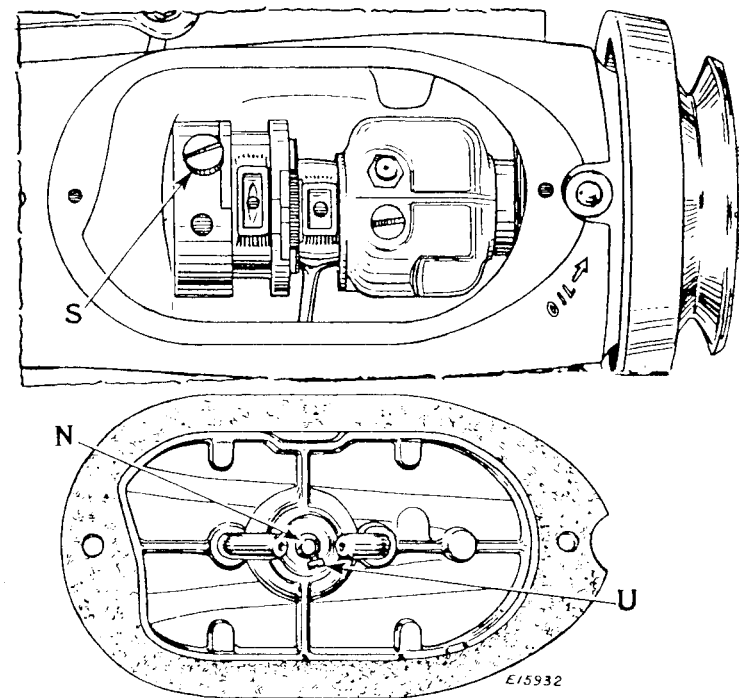


Fig. 23. Feed Eccentric

## To Prevent Operators from Changing Stitch Length

The stitch regulator plunger (N, Fig. 23) can be removed to prevent unauthorized or accidental changing of the stitch length. Take out screw (U) which will allow the plunger to be withdrawn when the stitch length has been adjusted. The hole in the arm should then be filled by inserting a screw 140317X (not regular equipment).

## To Set the Needle Bar at the Correct Height

See that the needle is pushed up into the needle bar as far as it will go, then remove the face plate.

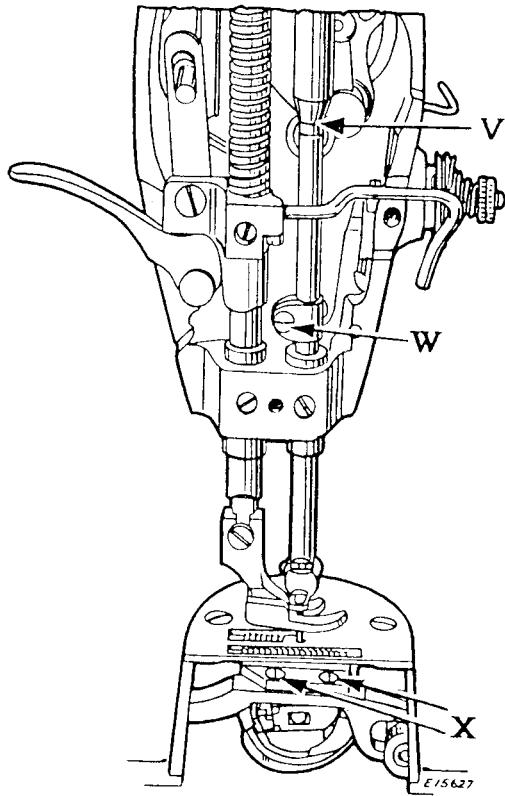


Fig. 24  
Needle Bar Set at Correct Height

The needle bar which is in the machine when shipped from the factory, has two timing marks near its upper end. Rotate the balance wheel until the needle bar moves down to its lowest position. The UPPER TIMING MARK on the needle bar should then be centered with the lower end of the needle bar bushing, as shown at (V) in Fig. 24. In case the needle bar is not set at the correct height, loosen screw (W, Fig. 24) and move the needle bar up or down until the UPPER TIMING MARK is centered with the lower end of the needle bar bushing, as shown at (V), then securely tighten screw (W).

In the event that the setting of the needle bar bushing has been disturbed, thus making it impossible to set the needle bar for correct height by center-

ing the upper timing mark with the lower end of the needle bar bushing, turn the balance wheel to bring the hook point to the center of the needle, loosen screw (W) and move the needle bar up or down to bring the top of the needle eye  $\frac{1}{32}$  inch below the point of the hook, then securely tighten screw (W). Loosen the needle bar bushing set screw at the top of the machine arm and, while the hook point is at the center of the needle and  $\frac{1}{32}$  inch above the top of the needle eye, move the needle bar bushing up or down to bring its lower end exactly even with the LOWER TIMING MARK on the needle bar, then securely tighten the needle bar bushing set screw.

## To Time the Sewing Hook

Remove presser foot, slide plate, throat plate and bobbin case. Take out the two screws (X, Fig. 24), and remove feed dog.

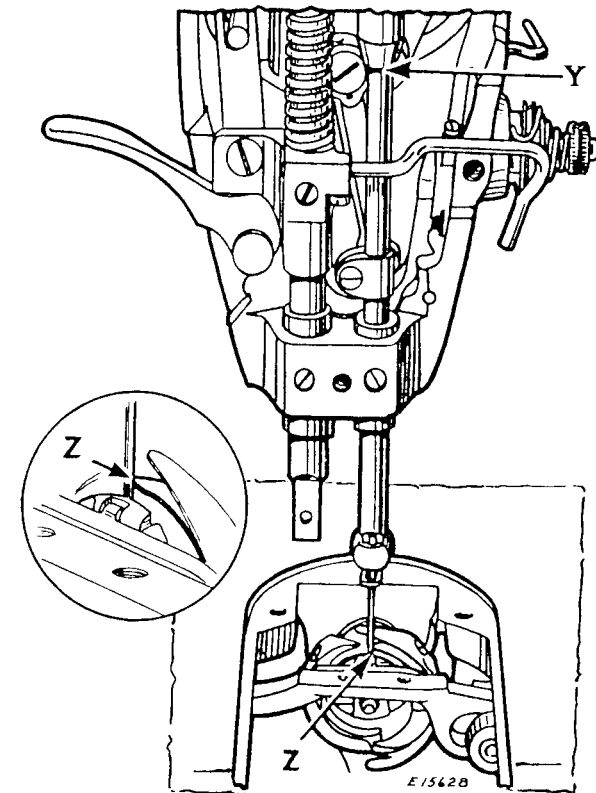


Fig. 25. Needle and Sewing Hook Correctly Timed

To determine that the hook is correctly timed, place a new needle in the machine, then turn the balance wheel over toward you until the LOWER TIMING MARK on the needle bar is centered with the lower end of the needle bar bushing as shown at (Y, Fig. 25) when the needle bar is on its upward stroke. With the needle bar in this position, the point of the hook should be at the center of the needle as shown at (Z, Fig. 25). The inset in circle at the left of Fig. 25 plainly shows this position of the hook point relative to the needle.

In case the hook is not correctly timed, loosen the three screws (E2, Fig. 26) in the hub of the hook. These three screws can be reached from the top of the machine bed through the opening left by the re-

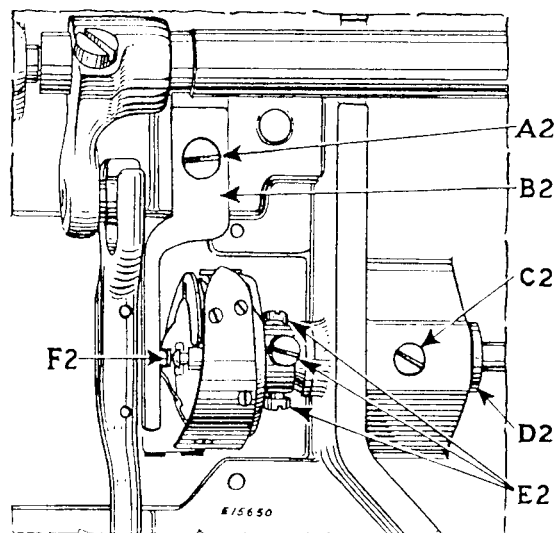


Fig. 26. View of Underside of Machine Showing Bobbin Case Holder Position Bracket and Adjustments on Machine

moval of the throat plate, although, for purposes of illustration, the screws are shown only in the view of the underside of the machine in Fig. 26. Rotating the balance wheel of the machine will bring these screws, one at a time, directly under the throat plate opening where they can be easily reached with a screwdriver from the top of the machine bed.

After loosening the three screws (E2) turn the hook on its shaft to bring the point of the hook at the center of the needle as shown at (Z, Fig. 25), then tighten the three screws (E2).

The hook should be set as close as possible to the needle without touching. If the hook is too close to the needle or too far away from it, loosen the three screws (E2) and the bushing screw (C2, Fig. 26) and drive the bushing (D2, Fig. 26) in or out, as may be required, until the hook just clears the needle, being very careful not to damage the bushing, then securely tighten the bushing screw (C2) and the three screws (E2).

## To Remove and Replace the Sewing Hook

Remove the needle, slide plate and bobbin case. Take out the screw (A2, Fig. 26) and remove the bobbin case holder position bracket (B2, Fig.

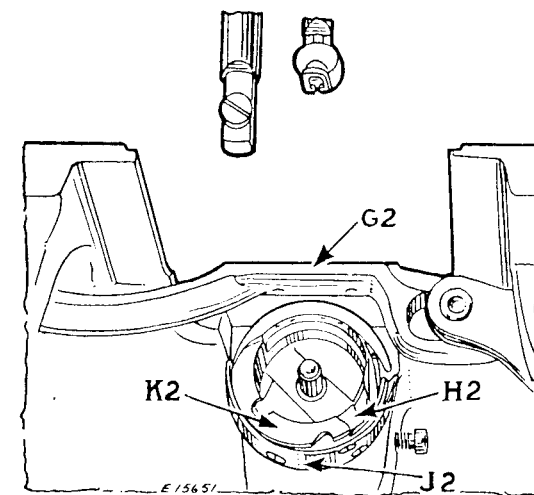


Fig. 27. Showing Correct Position of Thread Guard and Bobbin Case Holder for Removal of Sewing Hook

26). Loosen the three set screws (E2, Fig. 26) in the hub of the hook, then turn the balance wheel over toward you until the feed bar (G2, Fig. 27) is raised to its highest position. Turn the sewing hook until the thread guard (J2, Fig. 27) is at the bottom, as shown in Fig. 27, and turn the bobbin case holder (K2, Fig. 27) until it is in the position shown in Fig. 27. The sewing hook can then be removed from the hook shaft.

When placing a new sewing hook on the shaft, have the thread guard (J2) of the hook at the bottom and the bobbin case holder (K2) turned to the position shown in Fig. 27, so that the hook will clear the feed bar (G2).

When the hook is in position on the shaft, turn the bobbin case holder (K2, Fig. 27) until the notch (H2, Fig. 27) is at the top, then replace the bobbin case holder position bracket (B2, Fig. 26) being careful to see that the position stud (F2, Fig. 26) enters the notch at the top of the bobbin case holder, as shown in Fig. 26, then securely

fasten the position bracket by means of the screw (A2, Fig. 28). Replace the needle and time the sewing hook as instructed on pages 23 and 24. When tightening the three screws (E2, Fig. 26) in the hub of the hook, draw the hook shaft toward the needle bar end of the machine and press the hook toward the balance wheel to take up the end play in the shaft. Then replace the bobbin case and slide plate.

### To Remove and Replace the Sewing Hook Shaft

Remove the sewing hook as instructed on page 26. Take out the two screws (L2, Fig. 28) and remove the cover of the gear case (K), then wipe the grease from the gears.

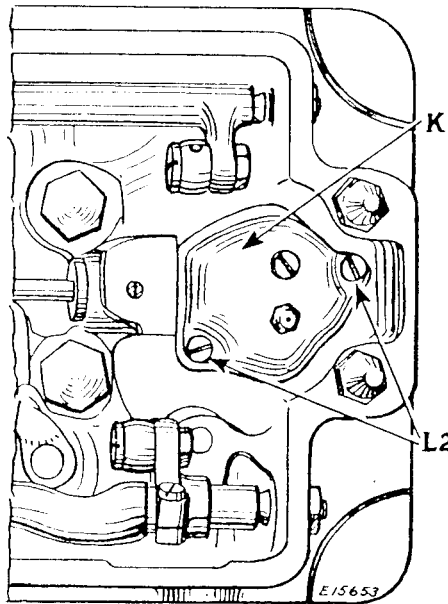


Fig. 28. Removing Lower Gear Case Cover for Hook Shaft Removal

NOTE - It is good practice to mark these gears, before removal of the hook shaft, to insure that, in case the gear (O2, Fig. 29) becomes displaced, it can be given its original meshing with the gear (N2, Fig. 29) on the upright arm shaft.

Loosen the two set screws in the gear (O2) and, while holding the gears in mesh, withdraw the hook shaft (M2) from the sewing hook end of the machine, as indicated in Fig. 29. Then while still holding the gears (O2) and (N2) in mesh, insert the replacement shaft through the

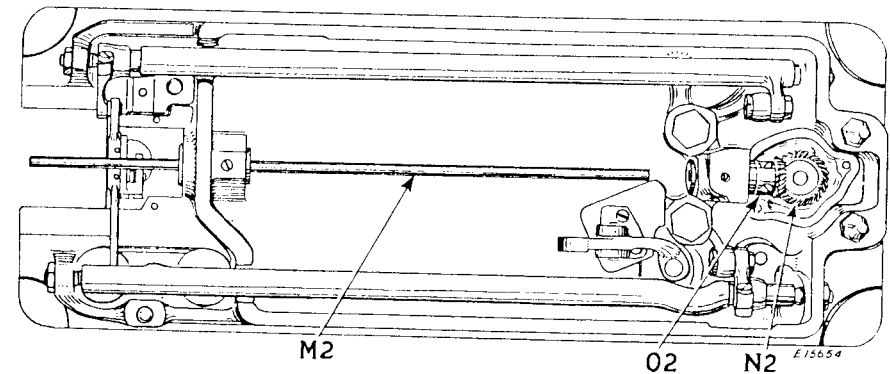


Fig. 29. Removing and Replacing Sewing Hook Shaft

front (left hand) bearing, the rear (right hand) bearing and through the gear (O2). When inserting the replacement shaft, have the end with the flat portion to the right so that one of the two screws in the gear (O2) will bear against it when tightened. The shaft should be set so that its left hand end is flush with the front (left hand) side of the body of the sewing hook.

When the shaft is correctly positioned, securely tighten the two set screws in the gear (O2), making sure that one of these two screws bears against the flat portion on the shaft. Time the sewing hook as instructed on pages 23 and 24.

Replace the gear case cover and fasten it in place with the two screws (L2, Fig. 28).

## To Remove and Replace Needle Bar Link and Thread Take-up

Remove face plate, needle, needle clamp, needle bar, presser bar thumb screw, presser bar spring, presser bar, presser bar slide bracket and presser bar lifting and releasing lever bracket.

NOTE - Be careful not to lose the small washer which is positioned at the upper end of the presser bar spring.

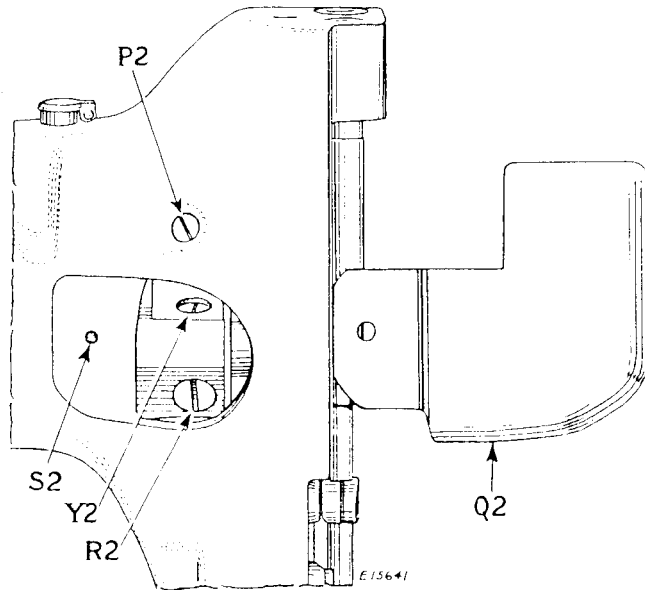


Fig. 30. Removing Needle Bar Link and Thread Take-up

Turn the balance wheel to bring the needle bar connecting link (Z2, Fig. 31) down to its lowest position, loosen the needle bar bushing set screw (V2, Fig. 31) and remove this bushing by driving it downward.

Remove the presser bar lifting lever to gain access to the screw at (S2, Fig. 30) which fastens the guard plate (Q2, Fig. 30) to the machine head. This guard plate, shown withdrawn from the machine in above illustration, is removed through the face of the machine after the presser bar has been removed. This guard plate normally closes the opening in the above illustration. Through this opening loosen, first, the clamping screw (R2, Fig. 30), then loosen set screw (Y2, Fig. 30) in the needle bar crank; also loosen the set screw (P2, Fig. 30) which holds the thread take-up link hinge stud. The complete take-up assembly,

including the needle bar connecting link and stud, can then be removed from the face of the machine.

Note that the needle bar connecting link (Z2) can be removed separately after removal of the needle bar and the hinge screw (left hand thread) (U2, Fig. 31 and 32).

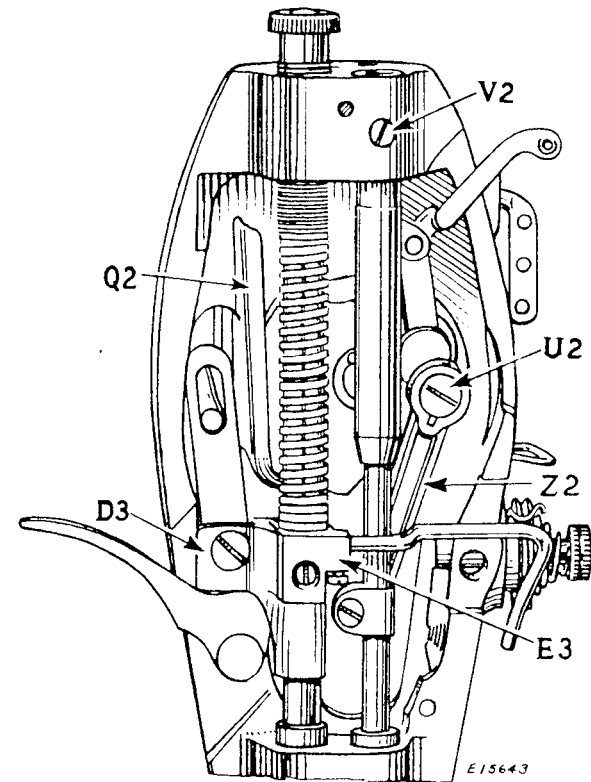


Fig. 31. Showing Parts in Correct Positions in Face of Machine

To replace, reverse the foregoing operations for removal, first firmly tightening the set screw (Y2, Fig. 30) and then tightening the clamping screw (R2, Fig. 30). Make certain that the slide block (W2, Fig. 32) is on the end of the needle bar connecting link stud, and that this slide block is in its slideway in the face of the machine as shown in Fig. 32; also that the needle bar connecting link (Z2) is replaced, as shown in Fig. 32, with the oil hole (X2) facing outward;



also that the wearing plate (A3, Fig. 32) is replaced on the thread take-up crank (B3, Fig. 32) and with its open end straddling the projecting

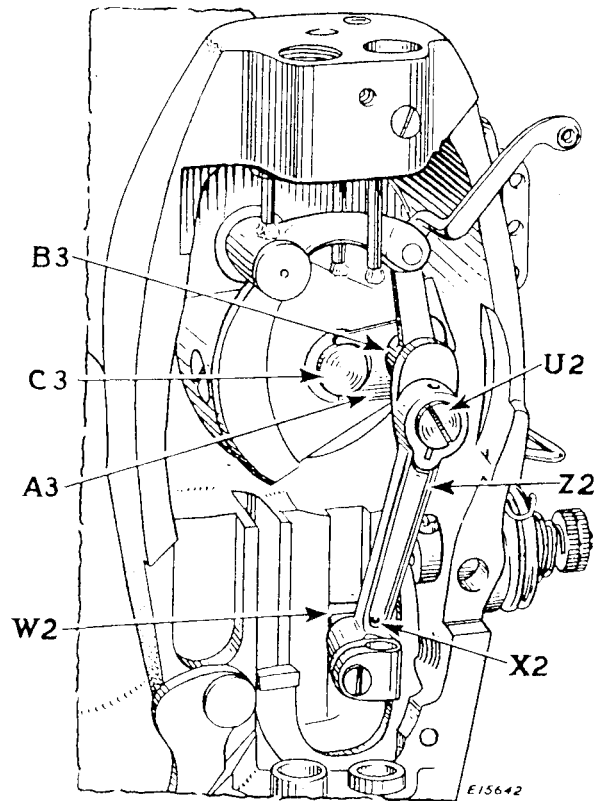


Fig. 32. Removing Needle Bar Connecting Link and Thread Take-up  
(Presser Bar and Needle Bar Already Removed)

end of the arm shaft at (C3, Fig. 32); also that the presser bar slide bracket (E3, Fig. 31) rests upon the presser bar lifting and releasing lever bracket (D3, Fig. 31) and that these two parts are replaced in the positions shown in Fig. 31. Also make sure that the small washer is in place on the upper end of the presser bar spring before inserting the presser bar thumb screw.

Set the needle bar and the needle bar bushing as instructed on page 22.

## Timing of the Feeding Mechanism

When the machine leaves the factory, the feed and feed lifting eccentrics are correctly set by having the timing screws in the eccentrics enter the grooves in the arm shaft. If, for any reason, it may be necessary to alter the timing of the feed eccentric, the timing screw should be removed and the eccentric locked in the desired position by means of the set screws only.