

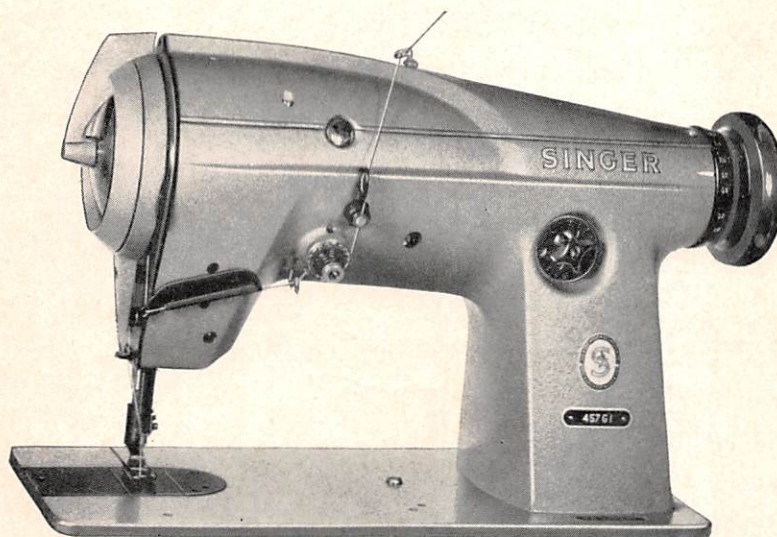
# **SERVICE MANUAL**

**for**

# **SINGER\***

## **MACHINE**

## **Class 457 G1**



**Machine Class 457 G 1**

**SINGER NÄHMASCHINENFABRIK KARLSRUHE AKTIENGESELLSCHAFT**  
**KARLSRUHE/BADEN (GERMANY)**

**From the library of: Superior Sewing Machine & Supply LLC**



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## DESCRIPTION

The 457 G 1 machine is a high speed, single needle, lock stitch, zig-zag sewing machine for stitching light and medium weight fabrics.

The machine specifications are as follows: -

1. Needle Bar Stroke 1-5/16 inch = 33.40 mm  
Presser Bar Lift 9/32 inch = 7.15 mm  
Maximum Width of Zig-Zag Stitch 5/32 inch = 4.00 mm  
Space at right of Needle 8-3/16 inch = 208.00 mm  
Maximum Length of Stitch 6 stitches per inch = 4.20 mm per stitch  
Bed 15-11/16 inches long, 7 inches wide = 398.50 mm long, 177.80 mm wide  
Machine Pulley (Safety Type) for 3/8 inch = 9.50 mm V-Belt. Outside diameter of belt groove 2.9 inches = 73.65 mm. Effective diameter for 5/16 inch = 7.93 mm round leather belt 2-3/8 inches = 60.30 mm.
2. Automatic lubricating system for supplying oil to all moving parts which can be observed through an oil flow window at the front of the machine arm.
3. Transverse, two to one, horizontal axis rotary hook, automatically pressure lubricated and with fine adjustment for the oil flow.
4. Single rotary take-up which controls thread at all times to meet the requirements of the hook.

5. Thread pretension and rotary thread tension for proper regulation of the stitch formation.
6. The width of the zig-zag stitch is set by turning the bight control knob and the corresponding setting is indicated at the front of the machine.
7. The length of the stitch is adjusted by changing the feed driving eccentric on the bed shaft and the setting is indicated on the machine pulley.
8. Pendant link mechanism with eccentric for adjusting the feed dog to height and parallelism.
9. Low inertia presser bar mechanism.
10. The arm shaft, the needle vibrating shaft and the belt end of the bed shaft are mounted in double-shielded ball bearings.  
Needle bearings for the needle bar yoke connecting link and the feed driving eccentric connection; super-oilite bushings for the feed driving eccentric rock shaft, the needle bar yoke shaft and the needle vibrating eccentric connection link.
11. The removable arm cover permits accessibility to all parts in the arm.
12. Vibration absorbing location of the machine in the machine base which is firmly mounted as oil pan and oil reservoir in the table.

## SPEED

The maximum speed recommended for this machine is 5000 R.P.M. depending on materials used and operations performed. It is advisable to run a new machine at a more moderate speed until an oil flow is visible in

the oil flow window and this speed should be maintained for several minutes. When the machine is in operation, the machine pulley must always turn over toward the operator.

## SETTING UP

The machine rests on a cork gasket in the machine base. The machine base also serves as drip pan, oil reservoir and as housing for the knee lifter.

When using the SINGER-table the machine base rests on its four corners and is fastened by means of rest pins (wooden) furnished with the machine. Any table-cut-out into which the machine base cannot be inserted properly must be reworked or adjusted by shims so that the machine base

1. does not rock,
2. is level in both directions,
3. prevents the inserted machine from touching the table,
4. raises the inserted machine above the table, enough to open the bed slide and that the bed hinge connections support the machine only when it is tilted back.

When assembling the knee lifter make certain that the knee lifter pin is properly inserted to connect the knee lifter mechanism of the machine with that of the machine base. The lifting range of the knee lifting lever can be adjusted by the screw "A", Fig. 1 (no lifting) and by the screw "B", Fig. 1 (full lifting). When using the full lifting range, the lifted presser bar lifter must disengage.

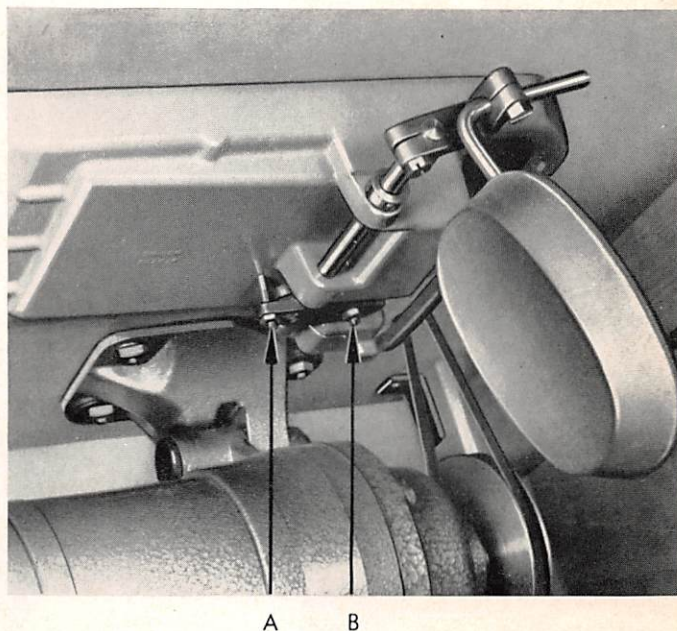


Figure 1



The static grounding contact "C", Fig. 2 with grounding contact wire, furnished with the machine, provides for the static grounding of the machine and will be fastened at the rear side of the machine base in such a manner that a contact with the machine bed is obtained. The paint should be removed from the contacting area of the machine bed and the grounding contact be fastened at the rest plate of the motor.

**Caution:** Make certain that all instructions for the lubrication of the machine are complied with before starting the machine. This also refers to checking the speed.

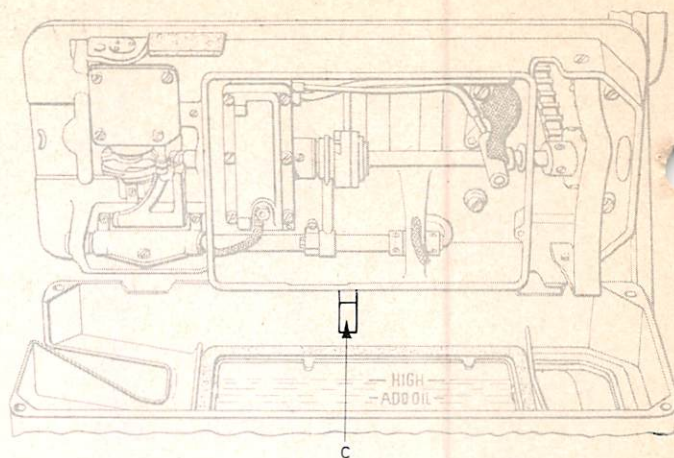


Figure 2

## LUBRICATION

Use only "Type C" oil, sold by the Singer Sewing Machine Company, for the automatic lubrication of the machine. This type of oil assures a troublefree lubrication and increases the life of the machine.

**Before starting the machine** fill the oil reservoir in the machine base up to the "HIGH" mark. The screw-type-pump, mounted in the machine bed, supplies oil to the

hook and to the machine parts and the oil supplied is protected by a screen against dirt.

The level of the oil should be checked daily and refilled when necessary. Never allow the oil level to drop below the "ADD OIL" mark.

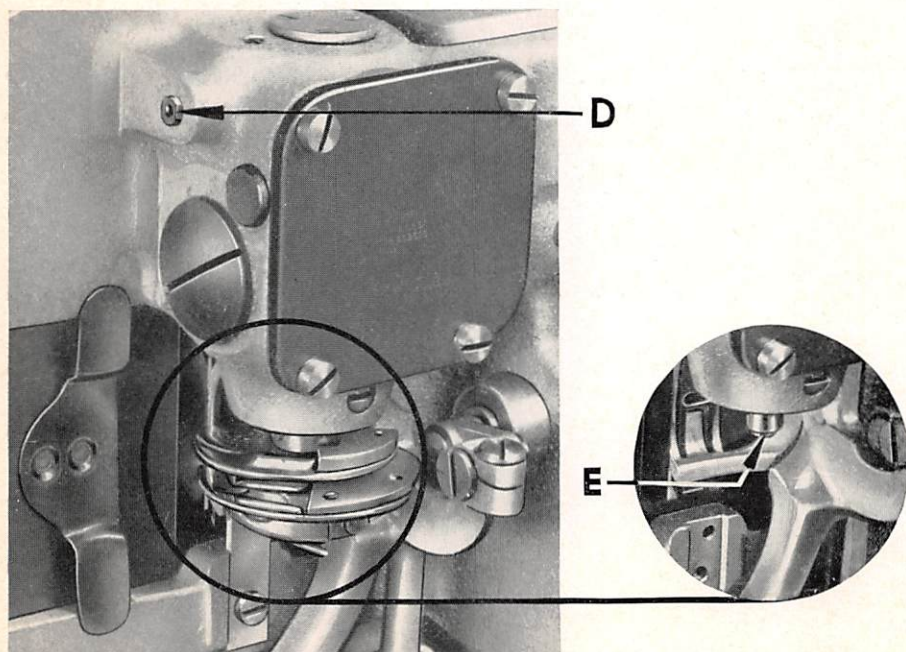
The oil screen should be cleaned as often as required depending upon the operations performed.

## ADJUSTMENT OF THE OIL FLOW FOR THE HOOK LUBRICATION

The regulating screw "D", Fig. 3 locked in place by a lock nut and located at the head side of the hook shaft gear box, regulates the oil flow for the lubrication of the hook. The oil flow is set at the factory for automatic lubrication of the hook under normal sewing conditions. In general, the normal adjustment can be made as follows: Turn the regulating screw in to its closed position and then loosen by approx. 2-1/2 turns. Turn the

regulating screw (to the right) to increase the flow of oil to the hook and turn the regulating screw out (to the left) to decrease the flow of oil to the hook.

The oil wick "E", Fig. 4 in the oil filter screw at the front end of the hook shaft must be replaced occasionally as it may have collected lint or other foreign matter causing an insufficient supply of oil to the hook.



Figures 3 and 4



If the hook receives an excessive amount of oil which cannot be reduced by the regulating screw, check to be sure that

1. the oil wick has not become detached from the filter screw,
2. the filter screw is securely tightened,
3. the oil return passages in the hook shaft, the bushing or in the hook bushing housing have not become clogged with lint or other foreign matter.

To determine the proper flow of oil to the hook clean the hook and, with the machine running at normal operating speed, hold a small piece of white paper under the hook for approx. 15 seconds without moving the paper or changing the speed. If the paper shows an oil streak of approx.  $1/32$  inch = 0.8 mm width the hook receives sufficient oil.

## NEEDLES

The needles recommended for this machine are Original SINGER-Needles Cat. No. 1905 (Syst. 265) chromium finish, available in the sizes 7 - 25.

The size of the needle to be used should be 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 operation of the machine.

Orders for needles must specify the quantity required, the catalogue number, the size number and the finish.

Example: 100 - 1905 - 14 - 1  
100 (Needles) 1905 (Cat. No.) 14 (Size)  
1 (Chromium Finish)

SINGER-Needles and packets are stamped with the trademark "SINGER".

## THREAD

Only left twist thread should be used in the needle (upper thread).

Either left or right twist thread can be used in the bobbin (bobbin thread).

To determine the thread twist hold the thread as shown in Fig. 5. Turn the thread toward the operator between the thumb and forefinger of the right hand; if left twist, the strands will wind together; if right twist, the strands will unwind.

Based on past experience the sizes of the needles and threads recommended for this machine are as follows:

Thread	60/3	70/3	80/3	-	Needle Size No. 14
	40/3	50/3	60/3	-	Needle Size No. 16
	30/3	40/3		-	Needle Size No. 18

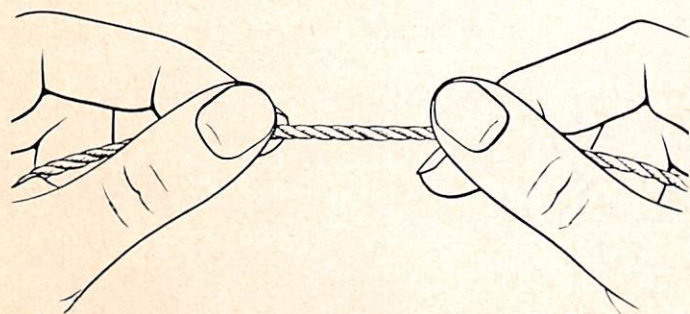


Figure 5



## TO REMOVE THE BOBBIN CASE CAP

First, turn the machine pulley toward the operator until the needle is at its highest point. After the bed slide has been opened reach under the table, open the bobbin case latch **"F"**, Fig. 6 and remove the bobbin case cap from the hook by means of this latch. While the latch remains open, the bobbin will be retained in the bobbin case cap.

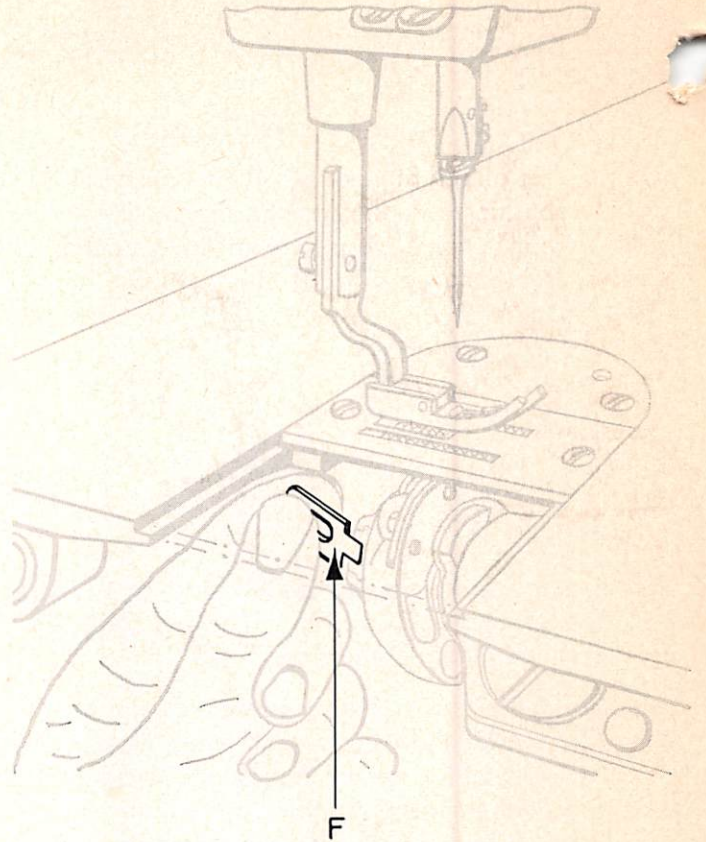


Figure 6

## TO WIND THE BOBBIN

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

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

Next pass the thread through the thread guide in the tension bracket **"G"**, Fig. 7 and around the tension discs to the bobbin. Then wind the end of the thread around the bobbin a few times and push the bobbin winder pulley 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 **"H"**, Fig. 7 at the tension bracket and move same to the right or left as required. Then retighten the screw **"H"**, Fig. 7.

The amount of thread wound on the bobbin is regulated by the screw **"J"**, Fig. 7. To wind more thread on the bobbin, turn the screw to the right; for less thread turn the screw to the left.

Bobbins can be wound while the machine is stitching.

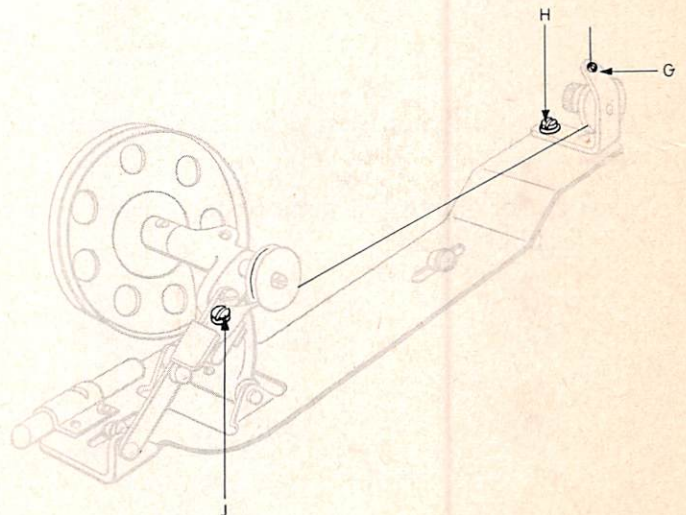


Figure 7



## TO THREAD THE BOBBIN CASE

Hold the bobbin between thumb and forefinger of the right hand as shown in Figure 8 so that the thread will unwind to the left.

Hold the bobbin case with the left hand as shown in Figure 8, with the spring upward and place the bobbin into the bobbin case.

Pull the thread into the slot "L", Fig. 9 under the spring "M", Fig. 9, through the next slot "N", Fig. 9 into the bobbin case and lead the thread out through the third slot "O", Fig. 9.

Figure 8

## TO REPLACE THE BOBBIN CASE

After threading take the bobbin case by the latch and place it on the center stud of the bobbin case base holder. Release the latch, press the bobbin case until the latch catches the groove near the end of the stud. Allow about 2 inch. = 50,8 mm of thread to hang free and close the bed slide.

Figure 9

## TO SET THE NEEDLE

Turn the machine pulley toward you until the needle bar reaches its highest point. Loosen the needle set screw at the lower end of the needle bar and push the needle into the bar to the needle stop with the long groove and the eye facing the operator. Then securely tighten the needle set screw.



## UPPER THREADING

As soon as the operator has become accustomed to threading the machine, the thread can be passed with a single continuous motion from the thread guide to the needle eye.

First, turn the machine pulley toward the operator until the needle is at its highest position. From the spool holder pass the needle thread from right to left through the rear hole of the thread guide "P", Fig. 10 on the arm cover and then from left to right through the front hole. Now draw the thread from right to left through the upper hole of the thread guide "R", Fig. 10 on the pretension and from left to right through the lower hole. Insert the thread from right into the pretension "S", Fig. 10, lead 1-1/2 times clockwise around the tension wheel "T", Fig. 10, over the thread take-up spring "U", Fig. 10, under the thread pull-off "V", Fig. 10 and to the thread guide hole of the long thread guide "W", Fig. 10. Then pass the thread through the opening in front of the face plate "X", Fig. 10, over the thread take-up lever "Y", Fig. 10, down through the thread guide eye "Z", Fig. 10, through the needle bar thread guide "AA", Fig. 10 and from front to rear through the eye of the needle.

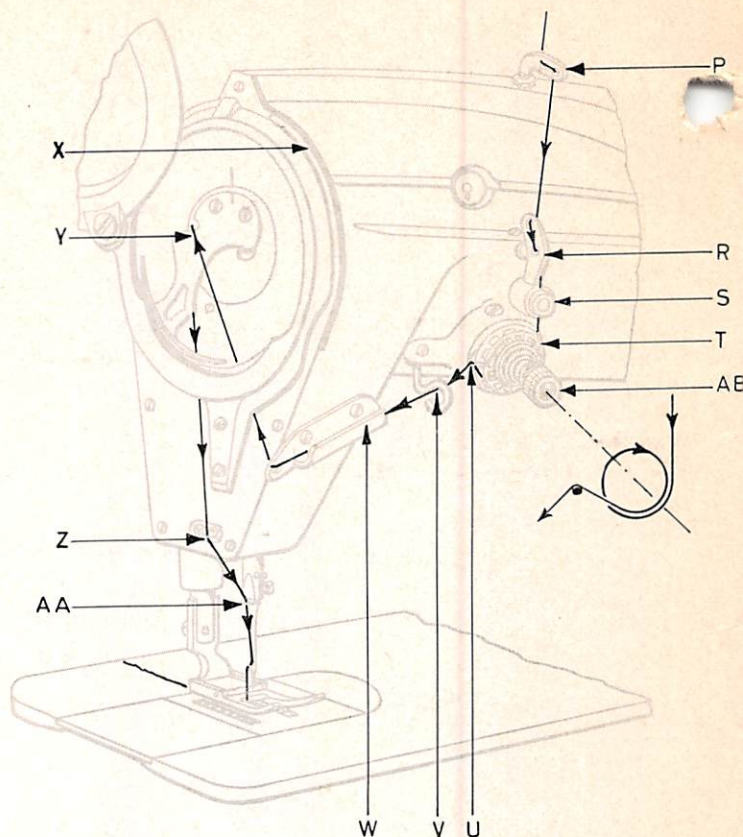


Figure 10

## TO PREPARE FOR SEWING

With the left hand hold the slack end of needle thread loosely and turn the machine pulley toward you until the needle moves down and up again to its highest

point thus catching the bobbin thread. Then draw up the needle thread and the bobbin thread will come with it. Lay both threads back under the presser foot.

## TO REGULATE THE TENSIONS

The upper and bobbin threads should be locked in the center of the thickness of the material, Fig. 11.

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, Fig. 12.

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 underside of the material, Fig. 13.

**The tension on the needle thread** should be regulated only when the presser foot is down and the thread tension not released. The tension is regulated by means of the tension thumb nut "AB", Fig. 10.

**The tension on the bobbin thread** is regulated by means of the small regulating screw "K", Fig. 8, in the bobbin case cap tension spring. To increase the tension, turn the screw to the right. To decrease the tension, turn the screw to the left. At the standard setting (= for normal sewing) the bobbin thread should just carry the weight of the bobbin case cap with the inserted bobbin.

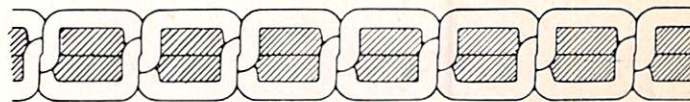


Figure 11

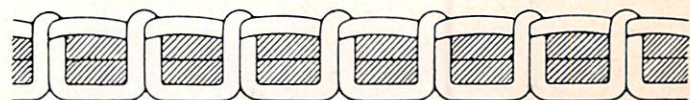


Figure 12

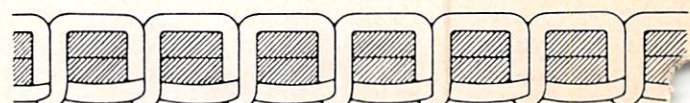


Figure 13



## TO REGULATE THE LENGTH OF THE STITCH

To change the length of the stitch stop the machine, then press down the stitch regulator plunger "AC", Fig. 14 in the bed and at the same time turn the machine pulley toward the operator until the plunger enters a notch in the feed driving eccentric. Turn the machine pulley until the desired number of stitches per inch on the machine pulley is opposite the reference mark on the front of the arm.

Number 6 on the scale will indicate the longest stitch and number 30 the shortest one which can be obtained with this machine.

**Caution:** Never depress the stitch regulator plunger while the machine is in operation.

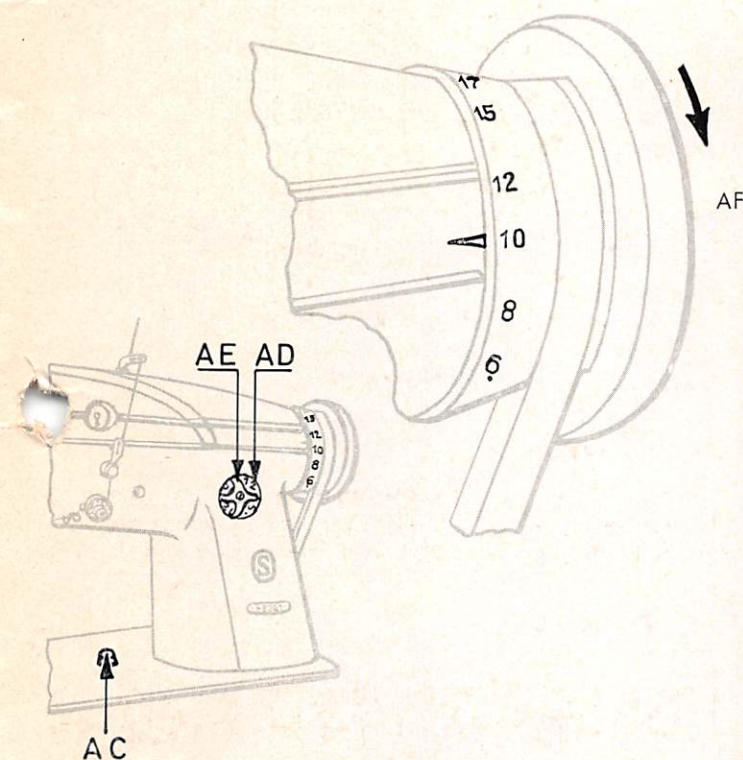


Figure 14

## TO SET THE WIDTH OF THE ZIG-ZAG STITCH

By turning the needle vibrator adjusting knob "AE", Fig. 14 on the front side of the arm, the desired bight can be set and the same checked on the dial "AD", Fig. 14 in five successive steps of  $1/32$  inch = 0.8 mm each.

The setting is to be done when the machine is out of operation. The dial reading "O" shows the straight stitch and the dial reading "5" indicates the widest bight.

## TO CLEAN THE HOOK AND THE THREAD WAYS

In order to preserve the life of the hook it is necessary to clean the hook by means of a brush once or twice daily depending on the materials used.

Two thread cutters "AF", Fig. 15 are mounted in the thread ways by the rotary take-up to avoid wrapping of the upper thread on the rotary take-up. After each upper thread breakage the rotary take-up must be checked for any remains of thread. These remains must be removed before rethreading.

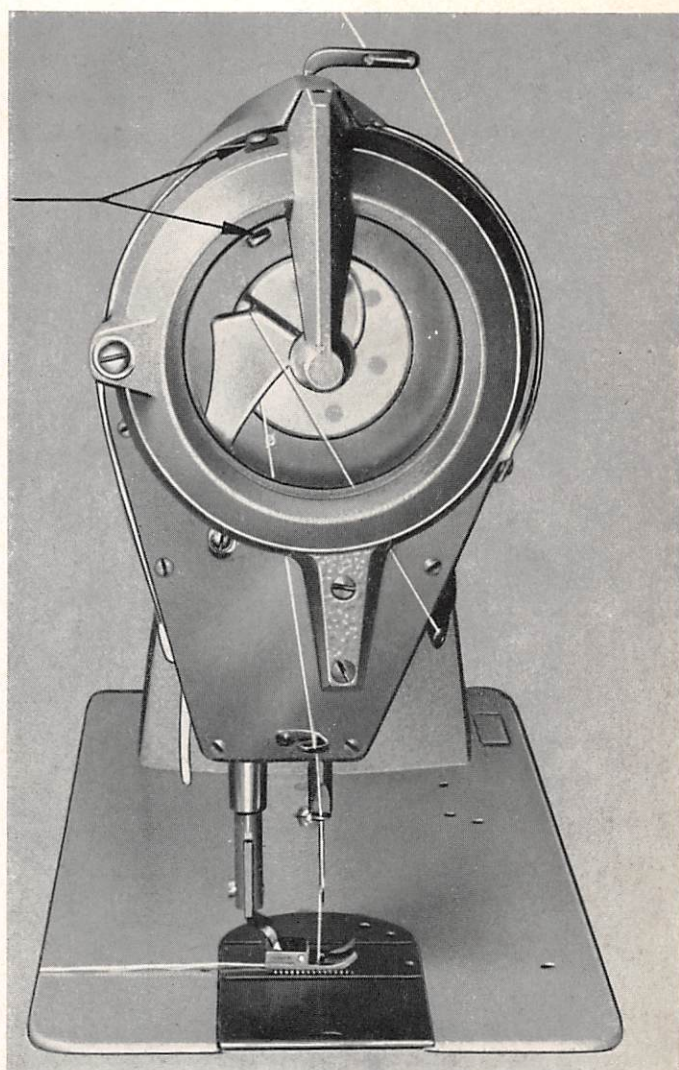


Figure 15

**Caution:** Attention to the above instructions will assure proper performance of the 457 G 1 machine.



## TIMING AND OTHER ADJUSTMENTS

The instructions on the following pages are for Adjusters and Mechanics only.

### TO SET THE THREAD TAKE-UP SPRING

The thread take-up spring "AJ", Fig. 16, set at the factory for normal sewing conditions, must have sufficient free movement to complete its action and should be at rest against the upper end of the thread take-up spring regulator "AH", Fig. 16 as the point of the needle in its downward stroke is approx.  $1/16$  inch = 1.6 mm above the material. The action of the spring should be sufficient to assure a light tension on the thread when same passes around the bottom of the bobbin case and casts off the hook point. By loosening the tension retaining screw "AG", Fig. 16 the tension complete can be rotated until the spring regulator is in the desired position.

The tension of the thread take-up spring "AJ", Fig. 16 is set by turning the tension stud "AK", Fig. 16 either toward the right to increase it or toward the left to decrease it with the tension screw "AG", Fig. 16 securely

tightened. The tension on the thread take-up spring should be sufficient to insure its action at top speed; however, it should be light enough so that the spring will move all the way down before the thread is pulled over the tension wheel. The tension on the thread take-up spring requires different settings depending upon the size of the thread and other particular sewing conditions.

### TO SET THE PRESSER BAR

In order to align the presser foot with the needle, lower the presser foot onto the throat plate and loosen the presser bar position guide pinch screw "AL", Fig. 17 through the opening in the face plate. Then move the presser foot into the desired position and securely tighten the pinch screw. The presser bar lifter must be set so that a presser bar lift of  $9/32$  inch = 7.15 mm is obtained.

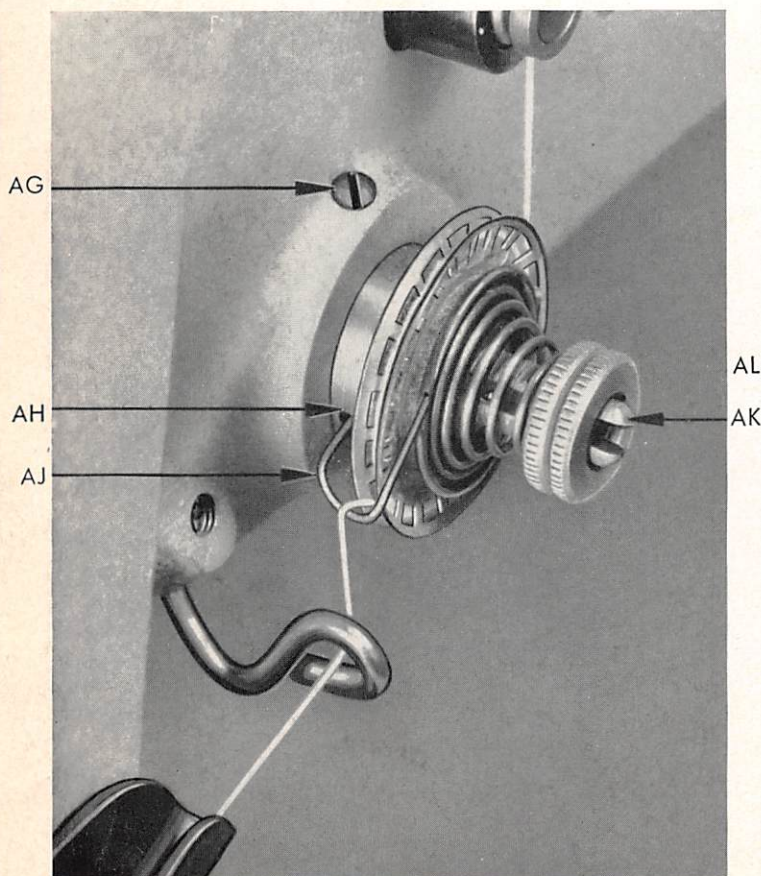


Figure 16

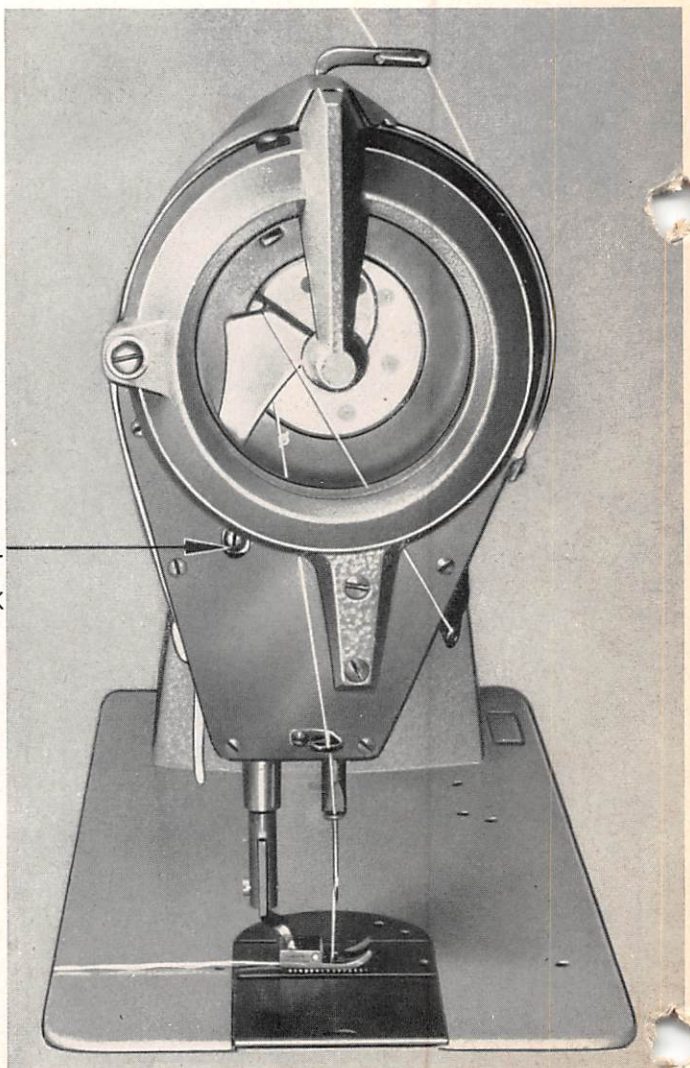


Figure 17



## TO REGULATE THE PRESSURE OF THE PRESSER BAR ON THE MATERIAL

The pressure of the presser bar on the material is regulated by the presser bar spring screw through the opening "AM", Fig. 18 in the arm cover. To increase the pressure turn the spring screw to the right (in), to decrease the pressure turn the spring screw to the left (out).

**Caution:** The pressure on the material should be as light as possible while still sufficient to insure proper feeding.

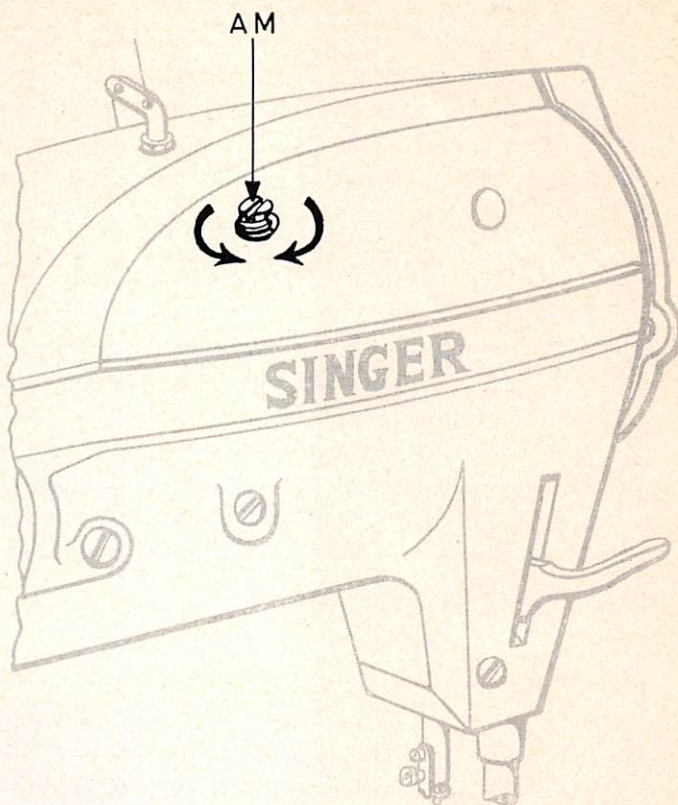


Figure 18

## TO SET THE TENSION RELEASER

The tension is automatically released (i. e. the pressure on the tension wheel) when the presser foot is lifted to its highest point by means of the presser bar lifter or the knee lifter. The tension release can be adjusted to act sooner or later by the regulating screw "AN", Fig. 19 after the lock nut "AO", Fig. 19 has been loosened.

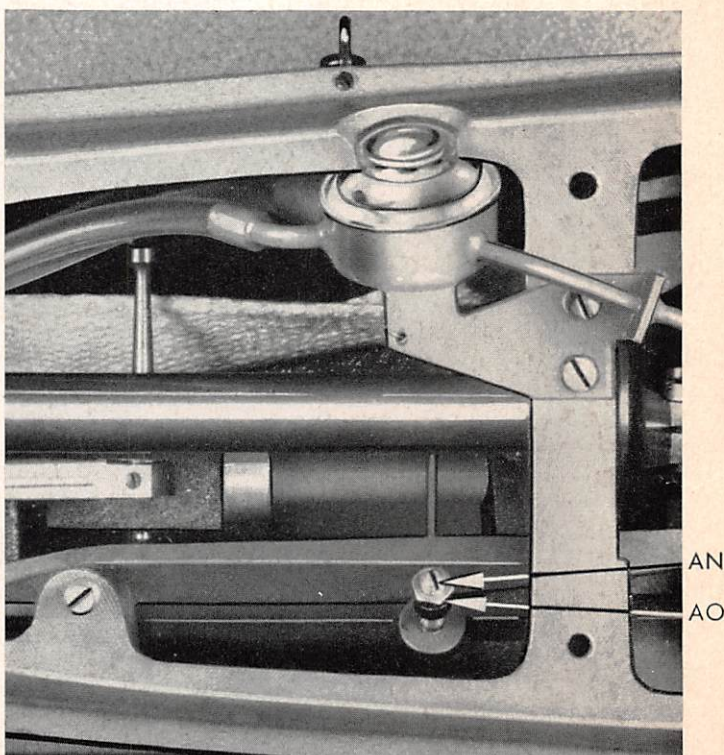


Figure 19



## TO SET THE NEEDLE BAR AT THE CORRECT HEIGHT

Remove the rotary take-up guard which is fixed by two screws to the face plate of the machine. Through the opening in the face plate loosen the needle bar set screw "AP", Fig. 20 in the connecting stud, just enough to permit adjustment of the needle bar.

Use the setting gauge G-22970 (consisting of a .276 inch = 7.01 mm gauge block and a .815 inch = 20.70 mm gauge pin). The gauge block is assembled in place of the throat plate and the gauge pin is inserted into the needle bar to its stop. Turn the machine pulley until the needle bar is at its lowest position and slide it downward until the plug touches the surface of the setting gauge. Then turn the machine pulley until the needle bar set screw is visible in the opening of the face plate. Tighten the needle bar set screw.

If a setting gauge is not available the needle bar may be set to the approx. correct height in combination with a properly timed hook.

First make certain that the hook point is set to the center line of the needle at the straight stitch setting of the machine (= position 0 on the needle vibrating adjusting dial) when the timing mark  $\phi$  on the face plate is in line with the timing mark on the rotary take-up. Then set the widest bight (= position 5 on the needle vibrating dial), turn the machine pulley until the needle is in the left position and bring the hook point to the center of the needle. The hook point should now be just slightly above the needle eye.

**Caution:** Whenever the height of the needle bar has been changed check the relationship between hook point to needle.

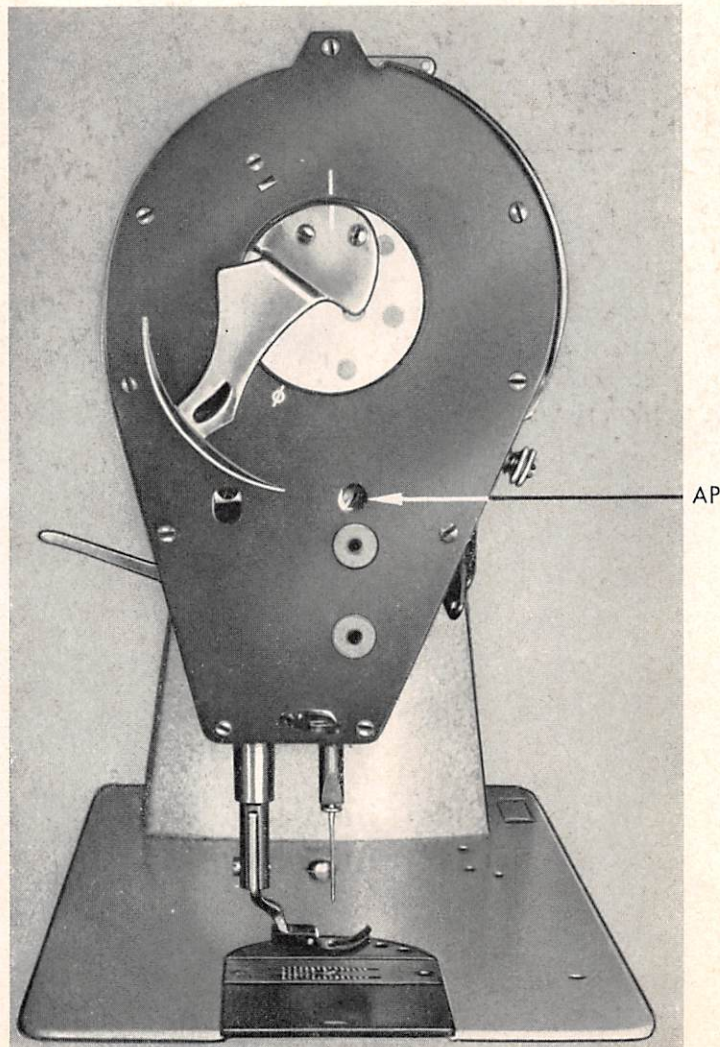


Figure 20



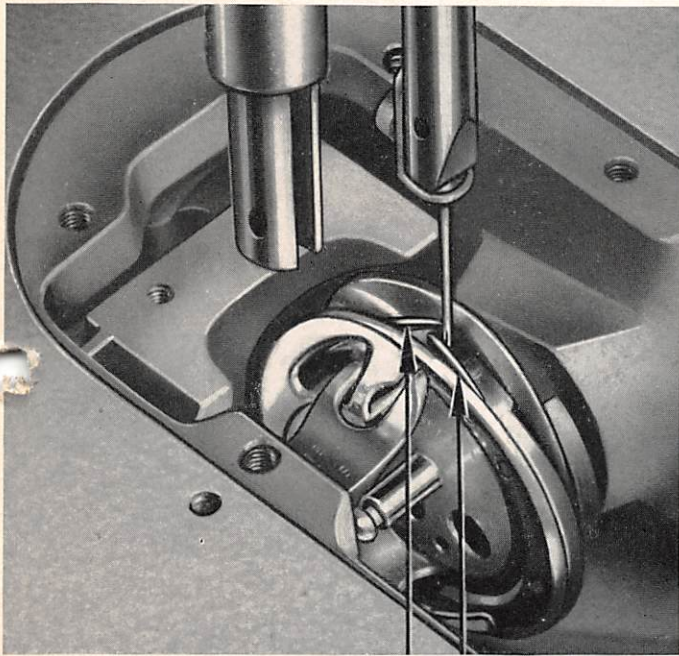
## TO TIME THE HOOK

The hook point "AR", Fig. 21 should be at the center line of the needle when the timing mark  $\phi$  "AT", Fig. 22 on the face plate is in line with the timing mark "AU", Fig. 22 on the rotary take-up. The needle should clear the hook point and contact the needle guard "AS", Fig. 21 without deflection.

For proper timing of the hook remove the presser foot, the slide plate, the throat plate, the feed dog and the bobbin case. Make certain that the height of the

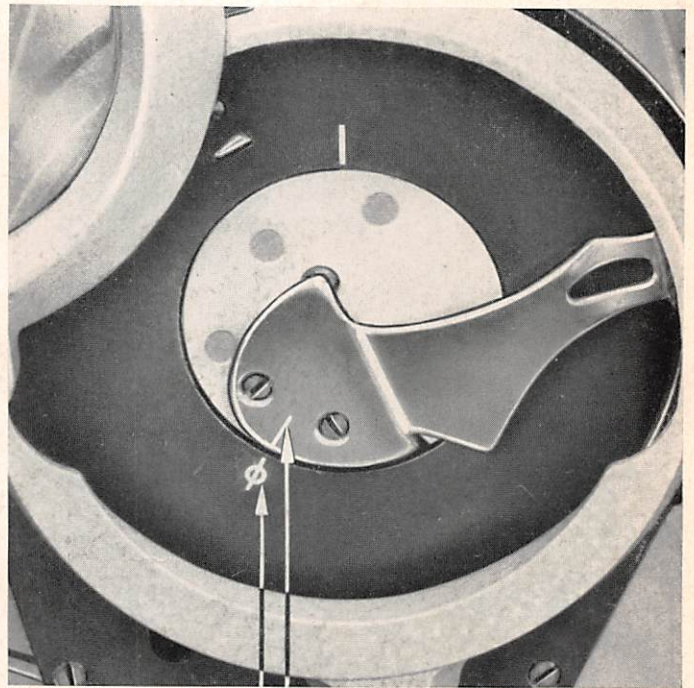
needle bar has been set correctly. Insert a new needle into the needle bar, loosen the two set screws in the hub of the hook and while holding the machine pulley (keeping the timing marks matched) rotate the hook until the hook point is at the center line of the needle. Retighten the hook set screws.

Check the clearance between the hook point and the needle in the extreme positions of the widest bight.



AR AS

Figure 21



AT AU

Figure 22

**Caution:** The hook point should pass the needle as closely as possible without, however, touching it.

The function of the needle guard is to prevent hook point damage when the needle is deflected into the path of the hook point. Whenever the hook has been replaced check the needle guard for proper adjustment.



## TO TIME THE FEED DRIVING ECCENTRIC

The stitch length of the machine can be changed by means of the feed driving eccentric as instructed under **"TO SET THE LENGTH OF THE STITCH"**.

The eccentric **"AW"**, Fig. 23 is held in the feed driving flange **"AX"**, Fig. 23 in a guide and adjusted by means of the adjusting screws **"AY"**, Fig. 23 which are secured by the lock screws **"AZ"**, Fig. 23 to prevent shifting. The linear movement of the eccentric is accomplished by turning the adjusting disc **"BA"**, Fig. 23. The adjusting disc spring and the adjusting disc spring retainer **"BB"**, Fig. 23 prevent the adjusting disc from moving out of position while the machine is in operation.

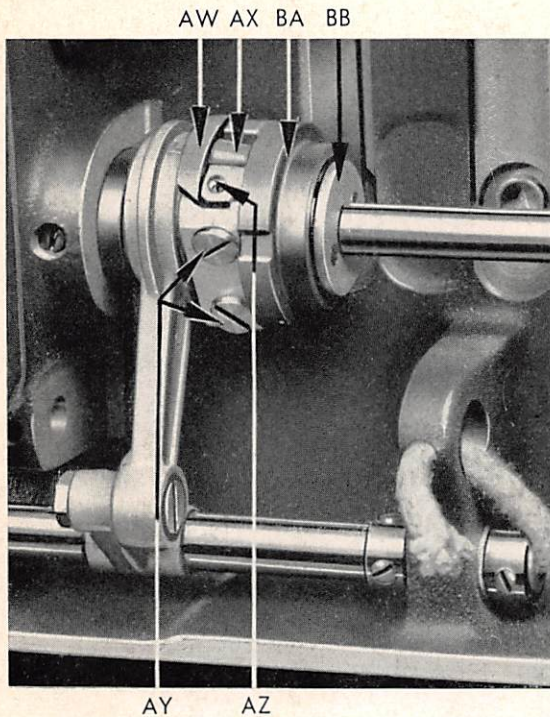


Figure 23

The timing of the feed driving eccentric in relation to the needle movement for normal sewing conditions should be made as follows:

Check the seating of the feed driving eccentric position screw in the splined groove of the bed shaft. The position screw is the first screw to appear when turning the machine pulley in the normal direction of rotation. Loosen the set screws of the bed shaft connection belt pulley and turn the machine pulley until the timing mark **"AU"**, Fig. 24 of the rotary take-up is in line with the upper timing mark **"AV"**, Fig. 24 on the face plate.

While maintaining this position turn the bed shaft with the feed driving eccentric until the timing mark on the notched side of the eccentric **"AW"**, Fig. 25 aligns with the timing mark on the feed driving link **"BC"**, Fig. 25. Then securely retighten the set screws of the belt pulley.

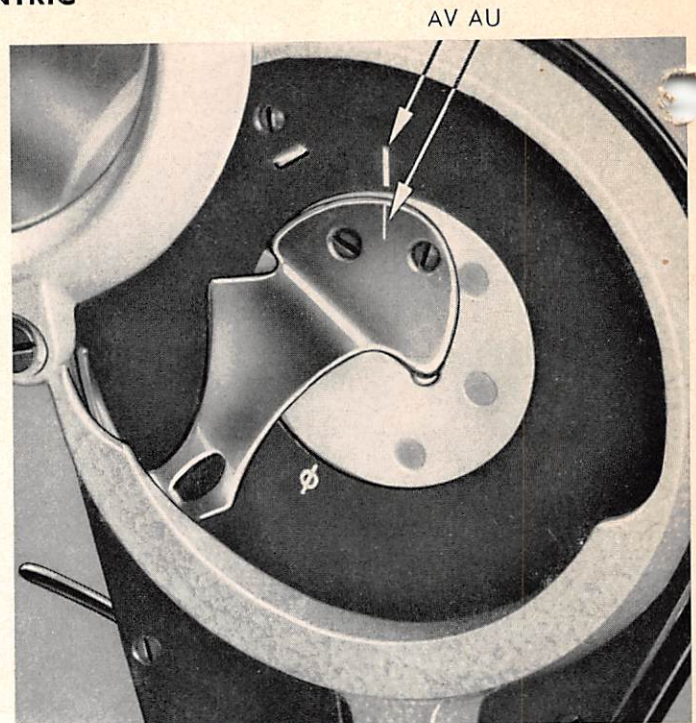


Figure 24

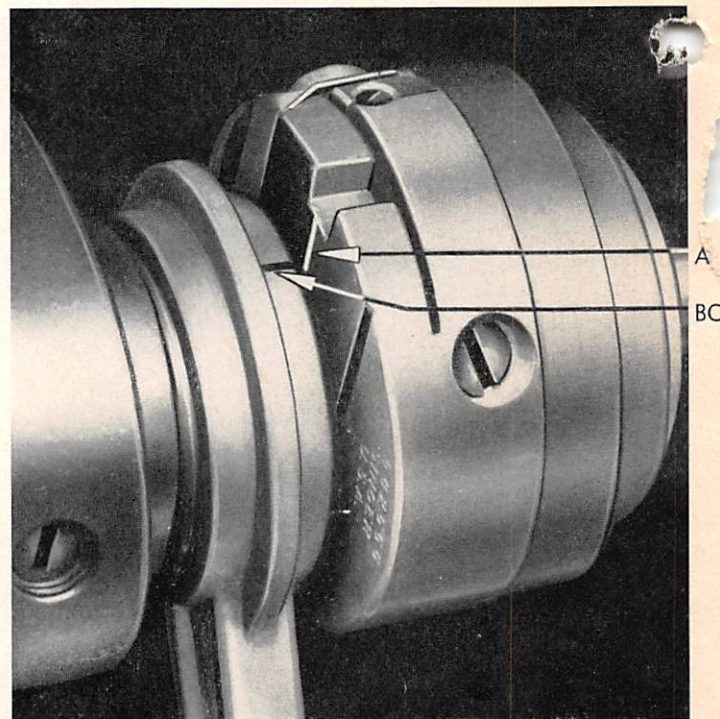


Figure 25

**Caution:** Whenever the timing of the feed driving mechanism has been changed, check the hook for proper timing as instructed under **"TO TIME THE HOOK"**.



## TO SET THE FEED DOG

The feed dog, controlled in its driving movement by the feed driving eccentric mechanism and in its lifting movement by the pendant link feed mechanism, is fastened by means of two screws to the feed bar. The sidewise centering of the feed dog is achieved by setting the feed dog in the center of the slots in the throat plate after the feed driving rock shaft crank pinch screw "BD", Fig. 26 has been loosened. The feed dog should also be centered lengthwise so that it does not touch the ends of the slots in the throat plate when the machine is set at the longest stitch.

The height of the feed dog is set by adjusting the feed bar lifting hinge pin "BF", Fig. 26 after the feed bar pinch screws "BE", Fig. 26 have been loosened. It is necessary that the indicator line at the head of the hinge pin is always upward toward the throat plate to maintain the prescribed ellipse of the feed dog.

The parallelism of the feed dog to the top surface of the throat plate is maintained by adjusting the hinge pin "BH", Fig. 26 after the set screws "BG", Fig. 26 have been loosened. The hinge pin is accessible through an opening in the bed.

For normal sewing conditions the feed dog should be set so that it shows a full tooth above the throat plate when the feed dog is at its highest position parallel to the surface of the throat plate.

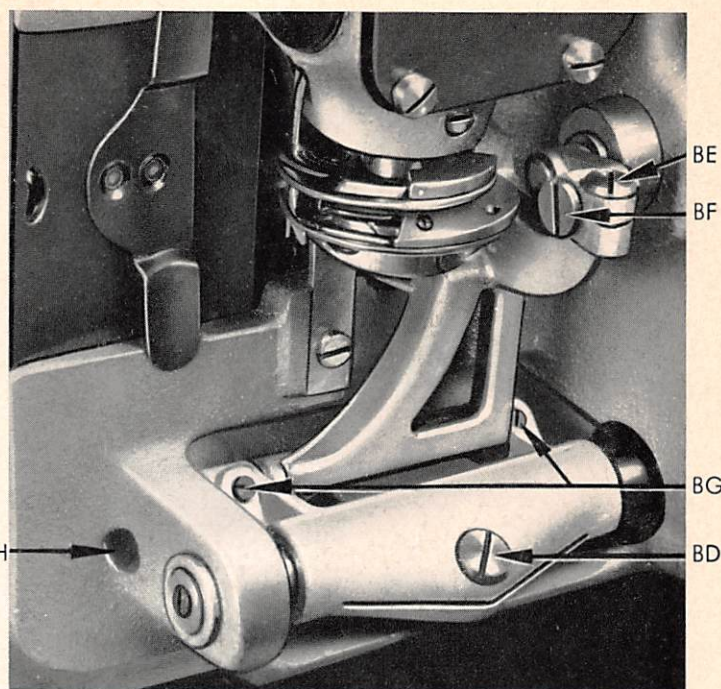


Figure 26

## TO SET THE NEEDLE VIBRATING MECHANISM

As instructed under "TO SET THE WIDTH OF THE ZIG-ZAG STITCH", the setting of the needle vibrating mechanism is infinitely variable. This mechanism is located below and crosswise to the arm shaft and should be adjusted only when the machine is out of operation.

The adjustment of the needle vibrating adjusting knob is transmitted through the needle vibrating shaft to the adjusting eccentric "BJ", Fig. 27. Its position screw, the first screw to appear when turning the machine pulley in the normal direction of rotation, is fastened to the flat on the needle vibrating shaft. The adjusting eccentric causes the linear movement of the needle vibrating eccentric "BK", Fig. 27 which is held in the eccentric driving flange "BL", Fig. 27 in a guide with a friction gib and is adjusted by means of the adjusting screws "BN", Fig. 27 and locked by the check screws "BM", Fig. 27 to prevent the needle vibrating eccentric from shifting while the machine is in operation. The needle vibrating shaft is also equipped with a needle vibrating eccentric stop "BO", Fig. 27. The function of this stop limits the bight to  $5/32$  inch = 4 mm when using regular sewing attachments and to any desired smaller bight when using sewing attachments for smaller zig-zag stitches.

The timing of the needle vibrating mechanism in relationship to the needle bar movement is set at the widest bight = dial reading 5. Adjust the sidewise movement to the up and down movements of the needle bar by turning the needle vibrating pinion on the arm shaft so that the needle movement in the right and left penetrations is as small as possible. This timing can be checked as follows: With the needle in its upward stroke and its left position just above the throat plate, place a piece of paper over the throat plate and turn the machine

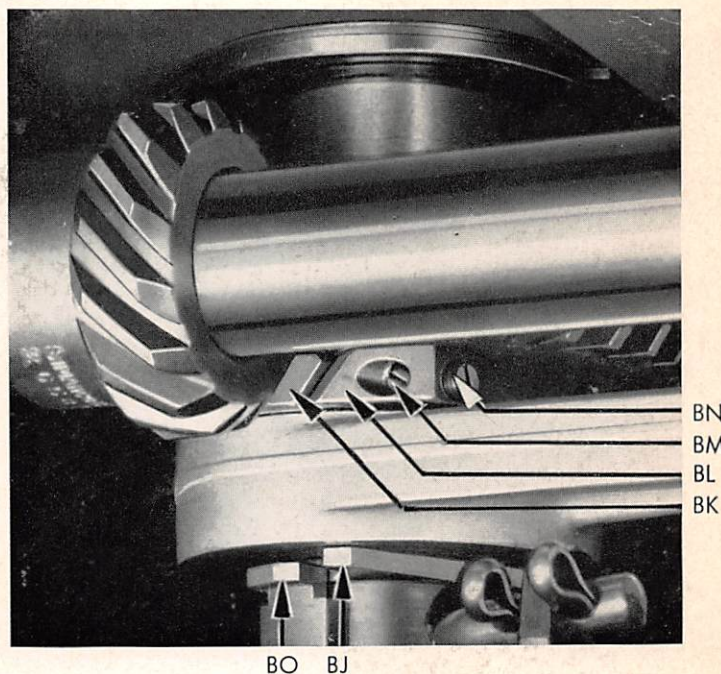


Figure 27

pulley backwards just penetrating the paper with the needle point as little as possible. Turn the machine pulley in the operating direction penetrating the paper on the right side without moving it and continuing on around until the needle in its downward stroke just penetrates the paper again on the left side as lightly as possible. The two penetrations should fall as closely in the same place as possible.



## TO SET THE NEEDLE BAR YOKE

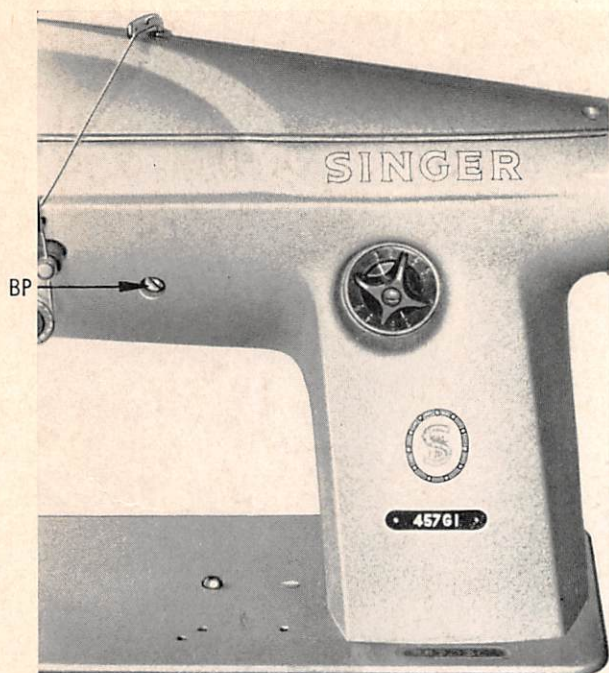


Figure 28

The needle bar yoke is driven by the needle vibrating eccentric through a connecting link. This connecting link has an eccentric for fine adjustment which permits the adjustment of the needle penetration to the throat plate. The fine adjustment can be performed by turning the eccentric stud "BP", Fig. 28, accessible through an opening in the front of the arm at the right side of the tension unit.

The front to back adjustment of the needle bar yoke is possible through the guide screws "BU", Fig. 29 and "BT", Fig. 30, located near the lower needle bar bushing and secured by lock screws to prevent shifting. The needle bar yoke through the guide screws can be so adjusted that the yoke and the needle bar connecting stud and link are perfectly in line for free operation. The rear needle bar guide "BU", Fig. 29, the needle bar connecting stud guide block "BS", Fig. 30 and the needle bar connecting link guide block "BR", Fig. 30 have been adjusted at the factory. **These adjustments should not be changed.**

Whenever a replacement of the needle bar yoke is required, a new adjustment must be made by means of gauges which can be obtained from SINGER-Agencies.

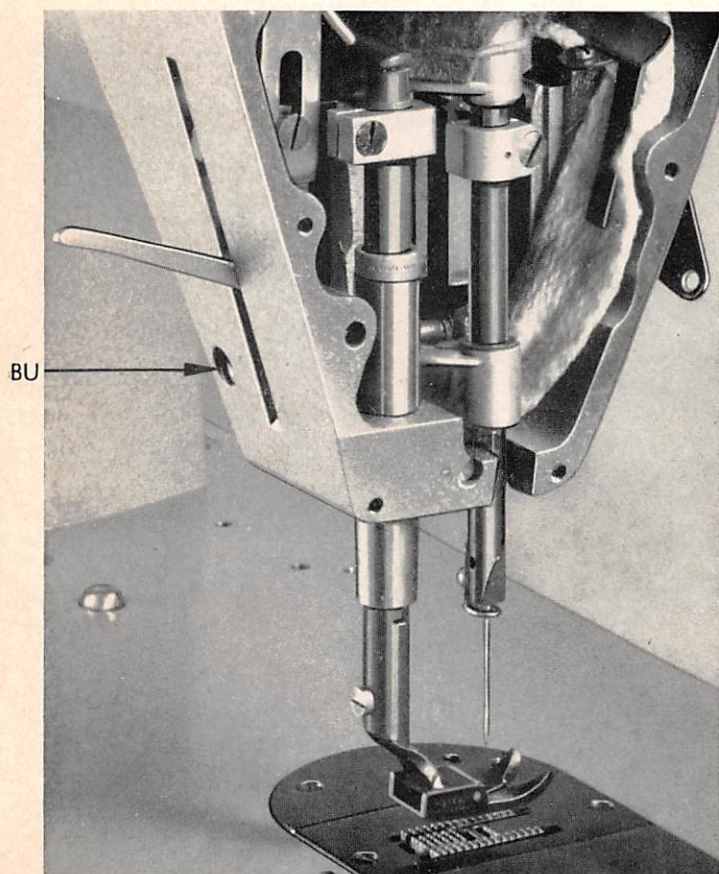


Figure 29

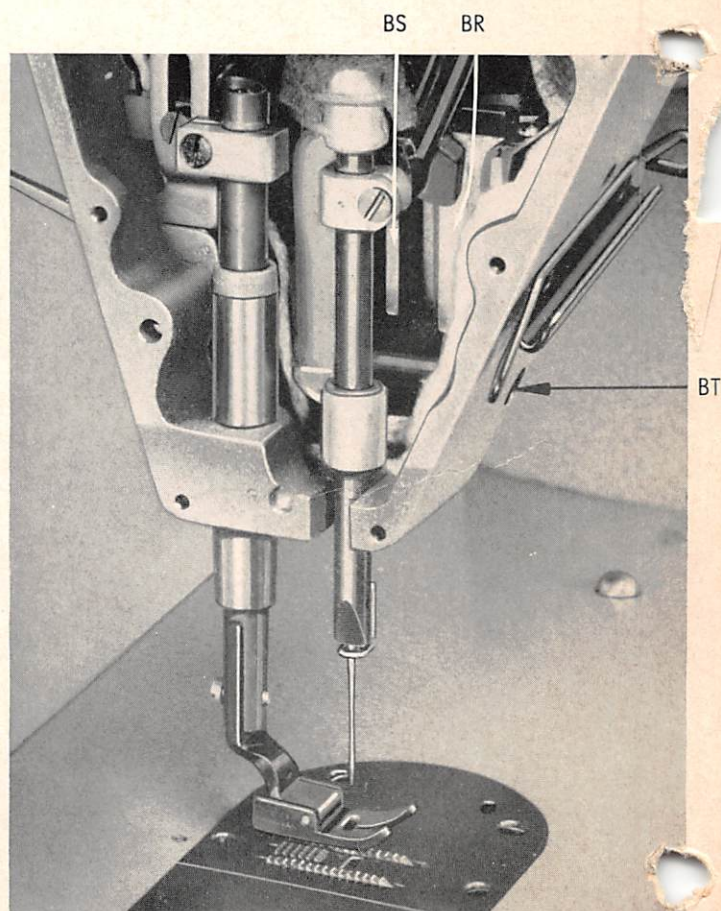


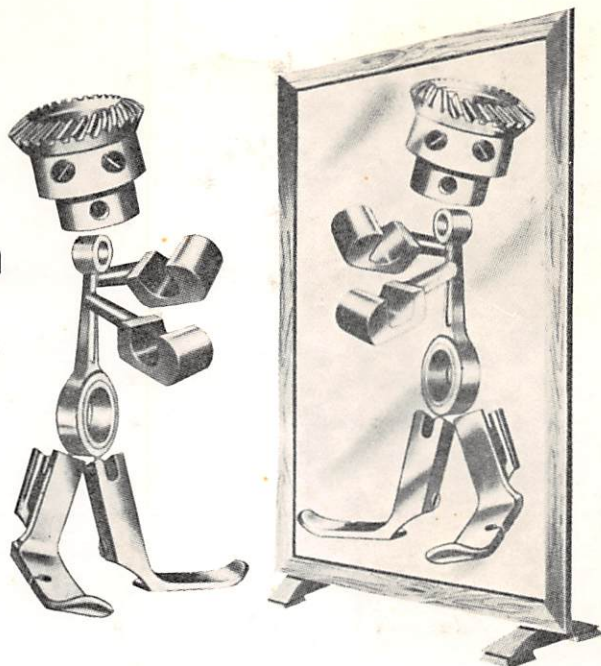
Figure 30



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