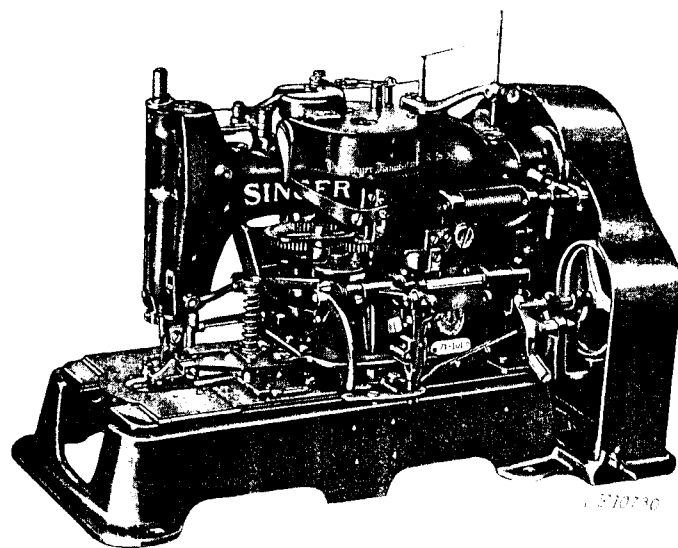


**SINGER**  
**71-101 & 71-103**

INSTRUCTIONS  
FOR USING AND ADJUSTING  
SINGER SEWING MACHINES



71-101 AND 71-103

HIGH SPEED      GEAR DRIVEN FEED

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THE SINGER MANUFACTURING CO.

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.

#### Purchasing of Parts and Needles

Supplies of parts and needles for Singer machines can be purchased at any Singer Shop for the Manufacturing Trade or ordered by mail. If orders are sent by mail, money or a post office order covering their value, including postage, should be enclosed and the order will then be promptly filled and forwarded by mail or express.

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

#### DESCRIPTION

Machines 71-101 and 71-103 are designed for making straight buttonholes in cotton, linen, rayon and silk fabrics, knit goods, etc.

These machines have a positive, gear driven, intermittent feed which controls the movement of the work clamp so that the stitches are uniformly spaced around the buttonhole under all conditions.

By simply changing the stitch regulating gear, the number of stitches in the buttonhole can be varied, as desired. (See list of stitch regulating gears on page 16.)

The stop motion mechanism of these machines includes a pair of gears having a ratio of 2 to 1 for reducing the speed of the stop cam to one-half of the speed of the sewing shaft. The stop cam has two stop notches located diametrically opposite each other so that when the stop motion mechanism is engaged, the stop cam turns only a part of a revolution before the interlocking rod drops into one of the notches to stop the machine. A single, extra long spiral spring in the stop cam gear helps the machines to stop without shock.

**Machine 71-101** makes purl stitch buttonholes with square barred ends, the hole being cut from  $\frac{3}{8}$  to  $\frac{3}{4}$  inch long. Both threads and the buttonhole are cut after stitching. Buttonholes up to 1 inch long can also be made on this machine by using Clamp Check Complete 249758, Clamp Check Holder 249756, Fibre Washer 40045 and a knife of the required length. These parts will be furnished, on order, in place of the regular equipment, or they can be supplied additionally at an extra charge.

**Machine 71-103** is the same as Machine 71-101 with the exception that it has no thread trimmers and makes buttonholes from  $\frac{1}{4}$  to  $\frac{3}{4}$  inch long. Buttonholes from  $\frac{1}{4}$  to 1 inch long can also be made on this machine by using Clamp Check Complete 249815 and Clamp Check Holder 39650 and a knife of the required length. These parts will be furnished, on order, in place of the regular equipment, or they can be supplied additionally at an extra charge.

Unless otherwise ordered, each of the above machines will be sent out fitted with a  $\frac{5}{8}$  inch knife and three additional knives for  $\frac{3}{8}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch buttonholes.

**Whip Stitch Buttonholes** can be produced on above machines by substituting the following parts in place of similar parts on the machine:

249533	Shuttle Bobbin Case Complete
40028	" Body
249682	Stitch Regulating Gear, 30 teeth
249725	" " " 36 teeth
249727	" " " 40 teeth
249744	" " " 45 teeth

### Speed

The maximum speed recommended for Machines 71-101 and 71-103 is 2000 stitches per minute. When the machines are in operation, the driving pulley should turn over to the left as indicated by the arrow in Fig. 7.

### To Set Up Machines on Singer Universal Safety Power Tables

When setting up the machines on the Singer Universal Safety Power Tables, a flat top table must be used.

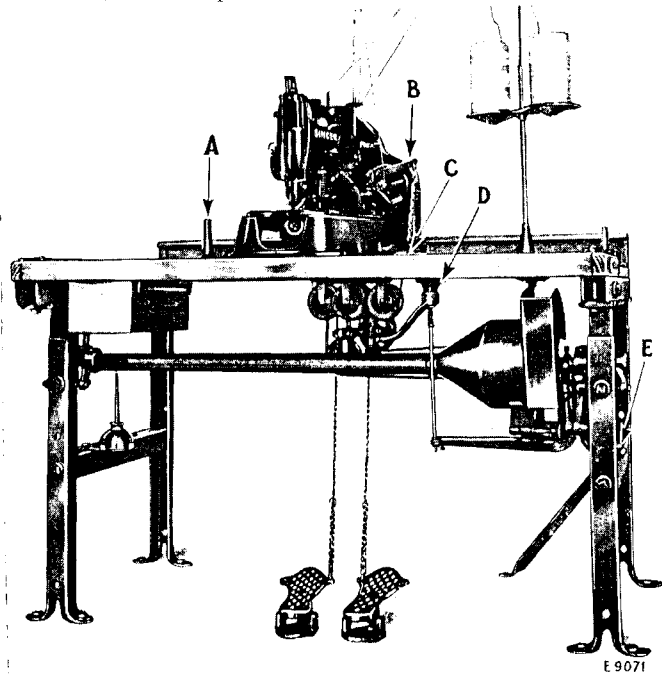


Fig. 2. Machine of Class 71- Set Up on Singer Universal Safety Power Table

The machines are usually set on the table about midway between the leg sections. Fasten the front plank extension (rear) to the centre board, as shown at C in Fig. 2, having the front edge of the extension close to the back edge of the front plank. Fasten the machine in position with its face plate toward the edge of the table nearest the operator and the end of the base flush with the front edge of the table.

Bore a hole in the table at the left of the machine for the rest pin, as shown at A in Fig. 2.

Bore a hole in the table directly underneath the screw (G2, Fig. 6), as shown at L in Fig. 4.

Bore a hole in the table at the right of the machine for the chain to connect the clamp operating lever (B, Fig. 2) with the left treadle.

Bore a hole in the table directly underneath the starting lever rod (D2, Fig. 6) for the chain to connect this rod with the right hand treadle.

Fasten the treadle chain guide 39572 (G, Fig. 3) to the underside of the table directly below the lever (B, Fig. 2) for operating the clamp.

Fasten the second treadle chain guide 39572 (J, Fig. 3) to the underside of the table directly below the starting lever rod (D2, Fig. 6).

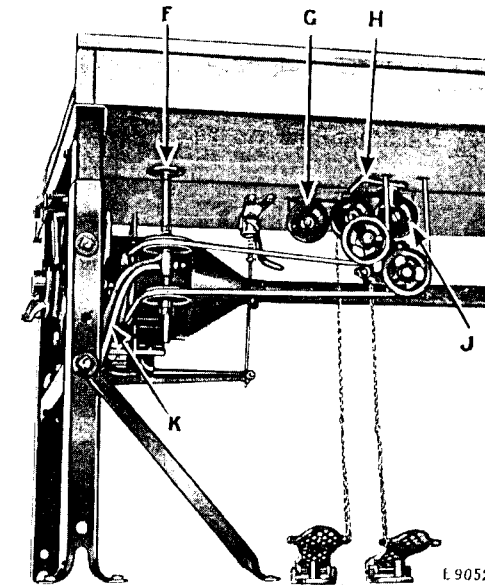


Fig. 3. Rear Underside View of Singer Universal Safety Power Table, Showing Idler, Belt Guide and Treadle Chain Guides

Pass the chain from the left treadle straight up and over the left pulley and under the right pulley of the treadle chain guide which is nearest the operator, then up through the hole in the table under the clamp operating lever (B, Fig. 2) to which it must be fastened.

Pass the chain from the right hand treadle straight up and over the right pulley and under the left pulley of the treadle chain guide which is farthest from the operator, then up through the hole in the table under the starting lever rod (D2, Fig. 6) to which it must be fastened.

Bore two belt holes in the table directly below the machine driving pulley.

Fasten the idler 126885 (H, Fig. 3) to the underside of the table directly below the belt holes.

Fasten the belt guide 126870 (K, Fig. 3) to the cross member of the leg section by means of the bolt, as shown at E in Fig. 2. Then fasten the plate for the upper end of the belt guide shaft to the underside of the table, as shown at F in Fig. 3.

Pass the belt around the driving pulley of the machine, around the pulleys of the idler (H) and belt guide (K) and around the driving pulley on the transmitter.

Fasten the transmitter control device to the underside of the front plank as shown at D in Fig. 2. This device is provided with a cam action, and when the handle is moved in one direction it depresses the starting lever of the transmitter, holding the transmitter clutch in engagement until the handle is turned in the reverse direction when the clutch is released.

#### To Set Up Machines on Universal Power Table with Singer Electric Transmitter Motor

The instructions given on pages 4 and 5 should be followed with the exception that the belt is passed around the pulley of the motor, around the pulleys of the idler (H, Fig. 4) and around the driving pulley of the machine, the motor being located at the left of the machine, as shown in Fig. 4.

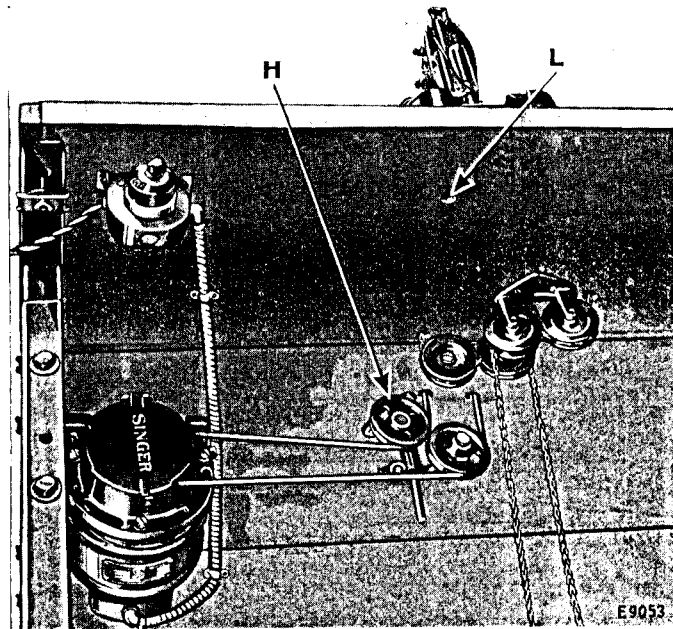


Fig. 4. Underside of Table, Showing Location of Idler, Treadle Chain Guides and Singer Electric Transmitter Motor for Individual Operation of Class 71- Machines

#### To Oil the Machine

When the machine is received from the factory, it should be thoroughly cleaned and oiled. Oil should be applied at each of

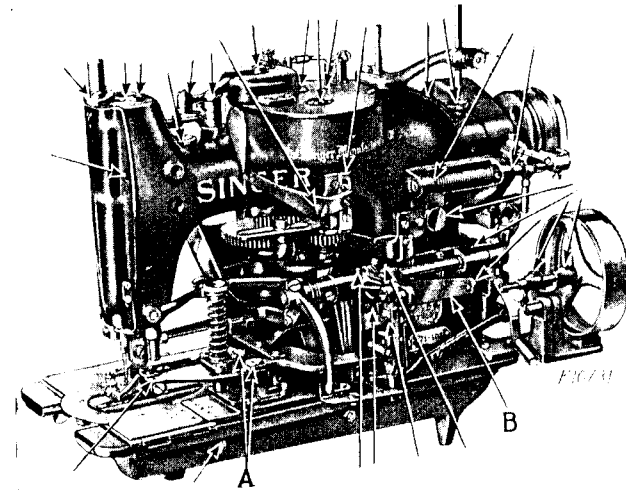


Fig. 5. Oiling Points at the Right of the Machine Also Adjustments on the Machine

the places designated by the unmarked arrows in Figs. 5, 6, 7, 20 and 24. When the machine is in continuous use, it should be oiled regularly to ensure easy running and prevent unnecessary wear of the parts which are in movable contact.

It is advisable to use a heavy grade of machine oil for the feed gears and stop motion mechanism in the rear of the machine.

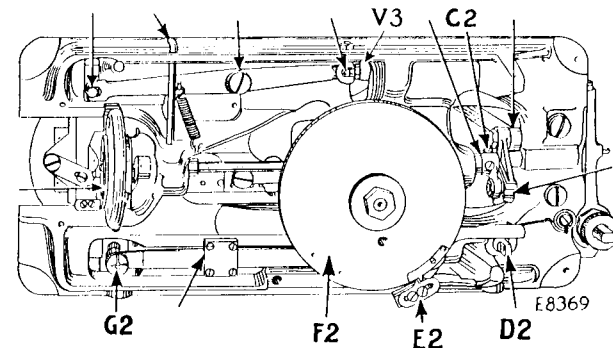


Fig. 6. Oiling Points in the Base of the Machine Also Adjustments on the Machine

To reach the parts underneath the bed plate, throw the belt off the pulley of the machine and turn the machine over on its hinges.

Occasionally remove the screw (G, Fig. 7) from the loose pulley and apply a small quantity of Singer Ball Bearing Lubricant to the ball bearing of the pulley through the tapped hole, then replace the screw (G).

Oil the shuttle bearing in the shuttle race at the place indicated by the unmarked arrow in Fig. 19, each time a bobbin is replaced.

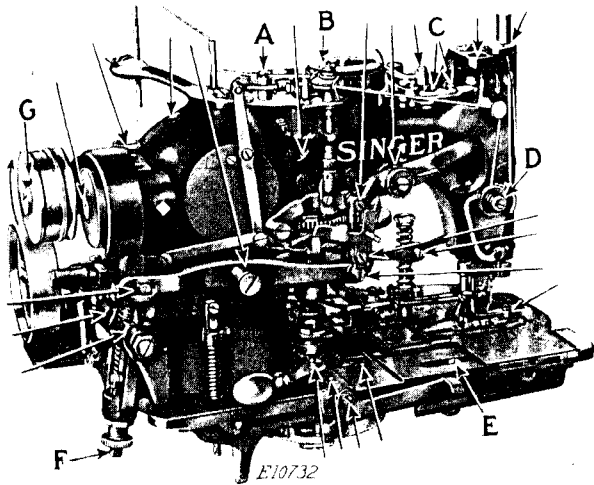


Fig. 7. Oiling Points at the Left of the Machine  
Also Adjustments on the Machine

### Needles

Needles for Machines 71-101 and 71-103 are of Class and Variety 71x1 and are made in sizes 9, 11, 13, 14, 16, 17, 18, 19, 21 and 22.

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. 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 interfered with.

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, 71x1 Needles."

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

### Thread

**For Purl Stitch buttonholes**, use right twist thread in the needle.

**For Whip Stitch buttonholes**, use left twist thread in the needle.

Either right or left twist thread may be used on the bobbin.

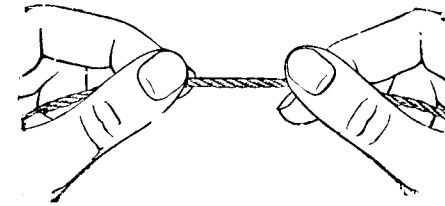


Fig. 8. How to Determine the Twist

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.

**For Purl Stitch buttonholes**, a heavier thread should be used in the needle than on the bobbin; for example, use No. 30 cotton in the needle with No. 70 or 80 cotton on the bobbin, or No. 40 cotton in the needle with No. 90 or 100 cotton on the bobbin.

**For Whip Stitch buttonholes**, use the same size thread for the needle and the bobbin.

### To Remove the Bobbin

Reach down under the bed of the machine with the thumb and forefinger of the left hand, open the bobbin case latch (B, Fig. 13) with the forefinger and lift out the bobbin case.

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

### To Wind the Bobbin

Place the bobbin on the bobbin winder spindle and push it up closely against the shoulder, having the small pin in the spindle enter the slot in the bobbin.

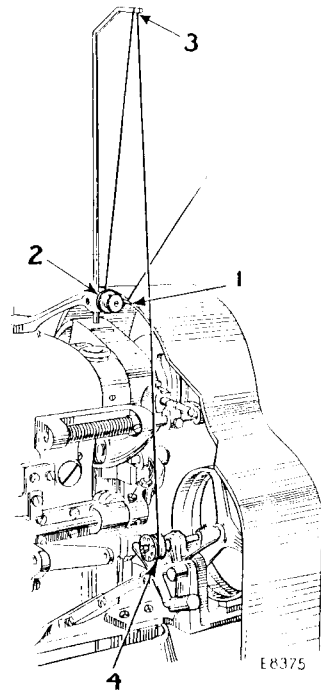


Fig. 9. Winding the Bobbin

Pass the thread from the unwinder, through the thread guide (1, Fig. 9) on the bobbin winder tension bracket attached to the top of the machine, under between the tension discs (2, Fig. 9), through the thread guide (3, Fig. 9), wind the end of the thread around the bobbin (4, Fig. 9) a few times, then push the bobbin winder pulley against the moving belt. When sufficient thread has been wound upon the bobbin, the bobbin winder will stop automatically. Bobbins can be wound while the machine is stitching.

### To Thread the Bobbin Case

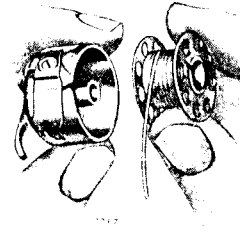


Fig. 10

Hold the bobbin between the thumb and forefinger of the right hand, the thread drawing on the top from the right toward the left (See Fig. 10.)

With the left hand hold the bobbin case as shown in Fig. 10, the slot in the edge being near the top, and place the bobbin into it.

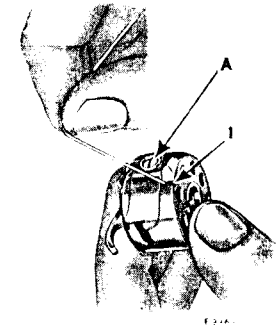


Fig. 11

Then pull the thread into the slot (1, Fig. 11) in the edge of the bobbin case, draw the thread under the tension spring and into the delivery eye (2) at the end of the tension spring, as shown in Fig. 12.

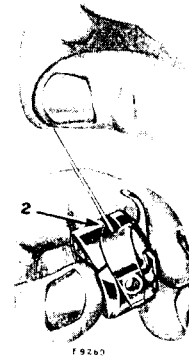


Fig. 12

### To Replace the Bobbin Case

After threading, take the bobbin case by the latch (B, Fig. 13), holding it between the thumb and forefinger of the left hand.

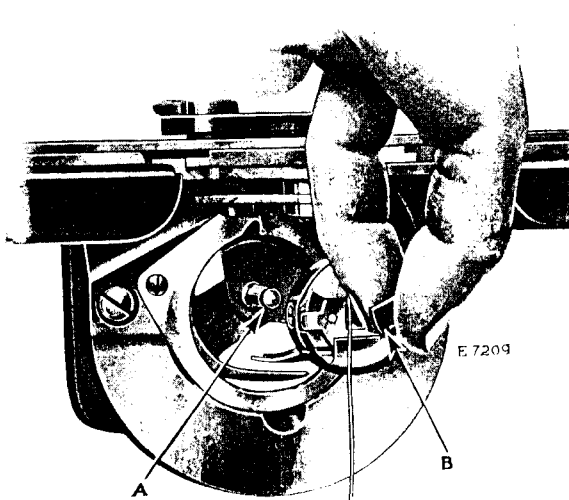


Fig. 13. Replacing the Bobbin Case

Place the bobbin case on the centre stud (A, Fig. 13) of the shuttle body with the position finger opposite the notch at the top of the shuttle race, release the latch and press the bobbin case back until the latch catches the groove near the end of the stud.

### To Set the Needle

Loosen the set screw in the lower end of the needle bar and put the needle up into the bar as far as it will go with its long groove toward you and the eye directly in line with the arm of the machine, then tighten the set screw.

### Upper Threading of Machine (See Figs. 14 and 15)

Pass the thread from the thread unwinder, downwardly through the hole (1, Fig. 14) in the top of the thread leader post, through the lower hole (2, Fig. 14) in the post, into the thread retainer (3, Fig. 14), through the thread eyelet (4, Fig. 14), around the back and between the tension discs (5, Fig. 14), through the thread eyelet (6, Fig. 14), into the thread guide (7, Fig. 15), down, under and from back to front between the tension discs (8, Fig. 15), up into the thread take-up spring (9, Fig. 15), under the tension thread guide (10, Fig. 15), up and from back to front through the hole (11, Fig. 15) in the end of the thread take-up

lever, into the slot (12, Fig. 15) in the face plate, into the wire thread guide (13, Fig. 15), through the hole (14, Fig. 15) in the lower end of the needle bar and from front to back through the eye of the needle (15, Fig. 15). Draw about two inches of thread through the eye of the needle with which to commence sewing.

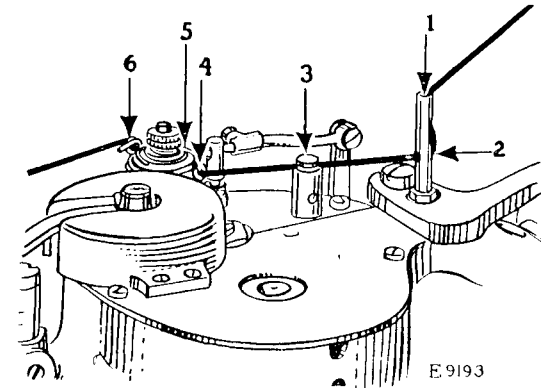


Fig. 14. Upper Threading of Machines 71-101 and 71-103

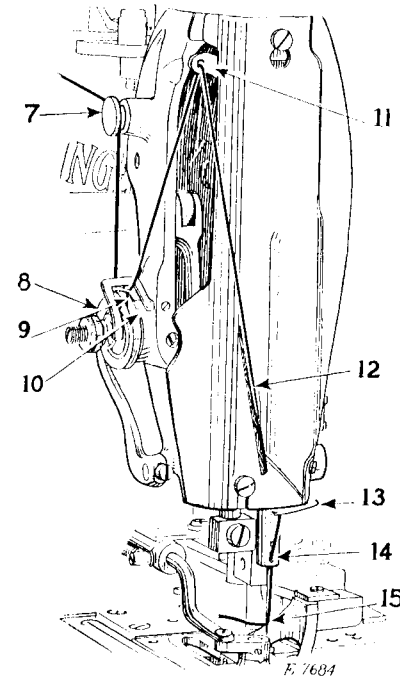


Fig. 15. Upper Threading of Machines 71-101 and 71-103



### To Place the Fabric Under the Clamp and Start the Machine

Raise the clamp by depressing the left treadle and place the work under the clamp so that the position for the end of the buttonhole nearest you is under the needle, then let the clamp down and start the machine by depressing the treadle at the right.

### To Operate the Hand Ratcheting Device

If the thread should break or the bobbin become empty while stitching, the buttonhole can be quickly repaired at any unfinished part of the stitching by stopping the machine, disengaging the stitch regulating gear and operating the hand ratchet lever, as follows:

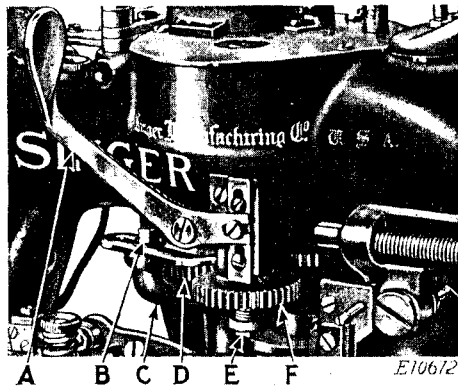


Fig. 16. Mechanism for Disengaging Stitch Regulating Gear

Press down the forward end of the stop lever (J, Fig. 17) and the machine will immediately stop with the needle at its highest point. Then with the right hand push the stitch gear disengaging lever (A, Fig. 16) backward to disengage the stitch regulating gear (F, Fig. 16) and while holding the lever (A) backward, operate the hand ratchet lever (G, Fig. 17) with the left hand until the work clamps are moved to the desired position.

To reengage the stitch regulating gear (F), release the disengaging lever (A, Fig. 16) and operate the machine slowly by means of the hand ratchet lever (G, Fig. 17) until the slot in the stitch regulating gear engages the driving pin in the shaft.

**CAUTION:** Under no circumstances can the machine be hand ratcheted unless the stitch regulating gear (F, Fig. 16) is disengaged. When changing the stitch regulating gear, be sure that the gear slides freely on the shaft and clamping nut sleeve (E, Fig. 16).

### To Regulate the Length of Buttonhole

Remove the slide from the left side of the bed of the machine. The gauge (H, Fig. 17), furnished with the machine, is marked

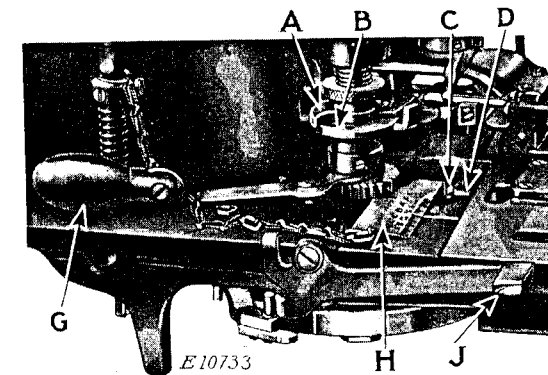


Fig. 17. Showing How to Regulate Length of Buttonhole

according to the style of bar and with numbers corresponding to the different lengths of buttonholes that can be made by the machine. The gauge (H) is also marked with the letters A, B and C which correspond to similar letters stamped on the collar (B, Fig. 17) of machines fitted with thread trimmers, for positioning the needle thread retrimming cam.

Loosen the nut (C, Fig. 17) and place the gauge in the slide-way as shown in Fig. 17, having the number on the gauge for the desired length of buttonhole opposite the line in the slideway. Then move the regulating lever (D, Fig. 17) until the sleeve under the nut (C) rests against the downwardly projecting part of the gauge and tighten the nut (C). Now, raise the cam (A, Fig. 17) and turn it until the pin enters either of the holes A, B or C, in the collar (B) according to the letter indicated on the gauge opposite the length of buttonhole for which the machine is being adjusted. Then replace the slide in the bed of the machine.

### To Change the Number of Stitches in the Buttonhole

The number of stitches in the buttonhole is controlled by the stitch regulating gear (F, Fig. 16) at the right hand side of the machine. When it is desired to change the number of stitches in the buttonhole, it will only be necessary to change the stitch regulating gear. To remove this gear, loosen the screw (B, Fig. 16) and swing the bracket (C, Fig. 16) with the large gear (D, Fig. 16) out of mesh with the stitch regulating gear (F). Then remove the nut (E, Fig. 16) and remove the stitch regulating gear (F) from its shaft.

#### Stitch Regulating Gears

Machine No.	Gear Number	Number of Teeth	Stitches per Buttonhole
71-101 and 71-103	249675	18	100
	*249677	20	90
	*249679	24	75
	*249682 ‡	30	60
	*249725	36	50
	249727	40	45
	249744	45	40
	249897	50	36

\* Regular equipment, unless otherwise ordered.

‡ Fitted to the machine when shipped from the factory, unless otherwise ordered.

Having selected the gear desired, place it in position on its shaft and securely fasten it with the nut (E, Fig. 16) below it. Swing back the bracket (C, Fig. 16) as far as it will go so as to bring the large gear (D, Fig. 16) into mesh with the stitch regulating gear (F, Fig. 16), then securely tighten the screw (B, Fig. 16).

### To Regulate the Tensions

Machines 71-101 and 71-103 have two thumb nuts (B and D, Fig. 7) for regulating the tension on the needle thread. When making purl stitch buttonholes the tension on the needle thread should be sufficiently strong to draw the purl evenly to the upper side of the buttonhole. When making whip stitch buttonholes the tension on the needle thread should be set equal to the tension on the bobbin thread.

For further adjustment of the needle thread tension on these machines, see page 22.

The tension on the bobbin thread is regulated by the screw (A, Fig. 11) in the bobbin case tension spring. To increase the tension, turn this screw over to the right. To decrease the tension, turn the screw over to the left. The tension on the bobbin thread should be light.

### To Regulate the Width of Bight

The width of bight is regulated by loosening the nut (V2, Fig. 18) and moving the stud in the slotted link at the top of the

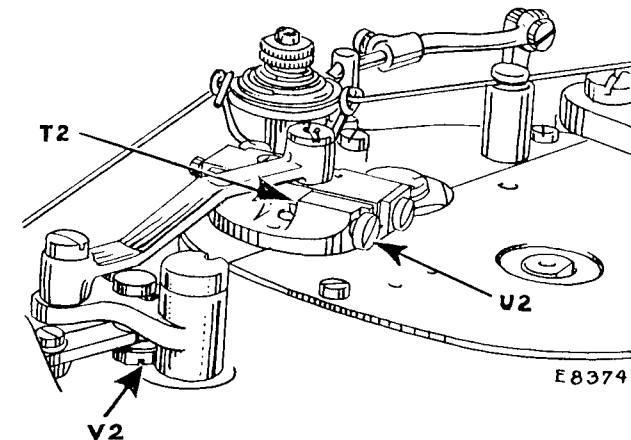


Fig. 18. Adjustments on the Machine

machine. To increase the width of bight, loosen the nut (V2) and move the stud to the left in the slotted link. To decrease the width of bight, move the stud to the right in the slotted link. When the desired width of bight is obtained, securely tighten the nut (V2).

When the width of bight has been changed, a further adjustment may be necessary to prevent the overthrow of the barring stitches while running at high speed. This adjustment is made as follows:

Turn the driving pulley of the machine by hand until the bar tripping point (E3, Fig. 21) rides upon the top of the barring plate (F3, Fig. 21), loosen the adjusting screw (U2, Fig. 18) and set screw (V2, Fig. 18) in the opposite end of the same tapped hole, then turn the adjusting screw until there is very little play in the barring slide, after which the set screw should be turned in against the end of the adjusting screw to lock it in position.

### To Adjust the Knife Slit in the Needle Plate

When the knife descends to cut the buttonhole, it must enter exactly in the centre of the slit in the needle plate. In case the knife does not enter in the centre of the slit, loosen the thumb screw (G2, Fig. 6) under the bed of the machine and move the clamp carrier slide until the knife is in the centre of the slit, then tighten the thumb screw.

### To Regulate the Cutting Space

The amount of cutting space between the lines of stitching is regulated by the screw (E, Fig. 7) in the slot in the bed of the machine. To make the cutting space wider, loosen this screw and move it backwardly in the slot. To make the cutting space narrower, move the screw toward you in the slot, then tighten the screw.

When making buttonholes either in light or heavy materials, the stitching should always be adjusted centrally to the knife, either with or without cutting space. To position the needle correctly, use the following instructions for adjusting the knife slit in the needle plate and aligning the needle bar.

### To Align the Needle Bar with the Knife

The needle bar frame pitman is adjustable by means of the two screws (C, Fig. 7); loosen these screws and move the needle bar frame until the needle on the right hand dip and knife are in exact alignment or to the left of the knife, half the amount of the cutting space, when the machine is stitching the first side of the buttonhole.

Should the knife cut too closely to the left hand side of the buttonhole, the needle bar frame pitman should be adjusted so as to throw the needle slightly more to the left. In case the knife is cutting too closely to the right hand side of the buttonhole, the needle bar frame pitman should be adjusted to throw the needle slightly more to the right.

### To Set the Knife

Take out the screw (B, Fig. 22) in the knife holder and remove the old knife. Place the new knife in the holder and push it up as far as it will go, then fasten it with the screw and washer. If the knife does not make a full cut, it should be set lower. The front edge of the knife should descend about  $\frac{1}{16}$  inch below the top of the needle plate, but not low enough to strike the shuttle. The knife should be kept sharp to ensure clean buttonholes.

## SPECIAL CAUTION

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Operators should be instructed that in case the machine is to be run around the second time and the clamp check is not raised, as the case may be in mending a buttonhole, it will be necessary, before starting the second sewing operation, to trip the top thread trimmer by a slight pressure to the clamp lifting treadle, which will trip the trimming blades but not release the material. If this is not done, it may cause the needle or the thread trimming and clamping blades to be broken.

## INSTRUCTIONS FOR ADJUSTERS AND MACHINISTS

### To Set the Needle Bar at the Correct Height

Turn the driving pulley of the machine until the needle bar moves down to its lowest point. When the needle bar is in this

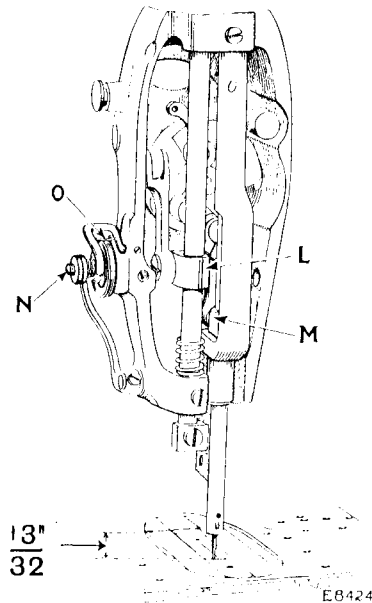


Fig. 19. Showing Correct Height of Needle Bar

position, the bottom end of the needle bar should be about  $\frac{13}{32}$  inch above the top surface of the needle plate, as shown in Fig. 19. In case the needle bar is not set at the correct height, loosen the screw which holds the needle bar to the connecting stud (M, Fig. 19). (This screw can be reached when the needle bar is at its lowest point by inserting the special screwdriver furnished with the machine through the hole provided for the purpose in the arm.) After loosening the screw, move the needle bar up or down in the connecting stud until it is at the correct height, as instructed above, then securely tighten the screw in the needle bar connecting stud.

### To Time the Shuttle

Turn the driving pulley of the machine until the needle bar on its left hand throw has moved down to its lowest point and has

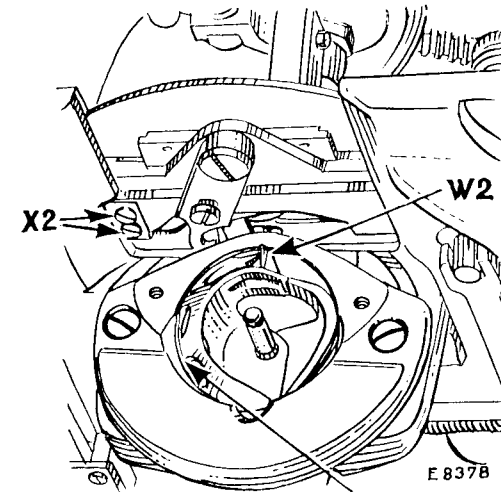


Fig. 20. Showing Shuttle Correctly Timed

risen about  $\frac{1}{10}$  inch. When the needle bar is in this position, the point of the shuttle should be at the centre of the needle and the eye of the needle should be about  $\frac{1}{16}$  inch below the point of the shuttle, as shown at W2, in Fig. 20. The correct timing of the shuttle is obtained by carefully tightening the upper screw (X2, Fig. 6) in the shuttle crank squarely against the flat part of the shuttle shaft and then tighten the other screw.

### To Adjust the Thread Retainer

The thread retainer (A, Fig. 7) should be adjusted to produce a very light tension on the thread. The tension should only be heavy enough to hold the thread take-up spring forward. To adjust the thread retainer, loosen the screw at its side and move the thread retainer up or down, as required, then securely tighten the set screw.

### To Adjust the Thread Take-up Spring

The tension on the thread take-up spring (O, Fig. 19) 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. The tension on the thread take-up spring is regulated by turning the tension stud (N, Fig. 19) over to the right to increase the tension, or over to the left to decrease the tension.

### Adjustment of Needle Thread Tension

Machines 71-101 and 71-103, which make purl stitch buttonholes with square barred ends, use both of the tensions (J2, Fig.

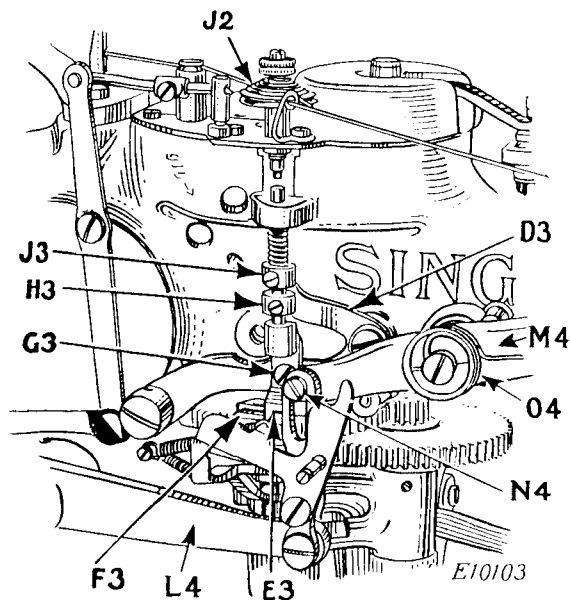


Fig. 21. Adjustments on Machines for Making Purl Stitch Buttonholes with Square Bars

21 and D, Fig. 7) when making the first row of side stitches in the buttonhole. At the completion of the first row of side stitches, the top tension (J2, Fig. 21) is released when the bar tripping point (E3, Fig. 21) is raised by the bar cam plate (F3, Fig. 21), and the first bar is made with the side tension (D, Fig. 7) alone.

At the completion of the first bar, the top tension (J2) is again engaged by the bar tripping point (E3) as it drops off the bar cam plate (F3), and both tensions are used for the second row of side stitches. Immediately before finishing the last stitch in the second row of side stitches, the top tension is released by the tripping point (E3) as it rides on the second bar cam plate (F3) and the second bar is made with the side tension (D) alone.

At the completion of the second bar, the top tension (J2) is again engaged by the tripping point (E3) as it drops off the bar cam plate (F3), and the tacking stitches are made with both tensions engaged, after which the machine stops automatically and releases both tensions.

The top tension (J2, Fig. 21) can be adjusted to open more or less according to the size of thread being used, by loosening the set screw in the lower collar (H3, Fig. 21) and raising the collar to open the tension discs less or lowering it to open more, after which tighten the set screw in the collar.

### To Set the Barring Cam Plate

The barring cam plate (F3, Fig. 21) controls the position of the barring stitches in relation to the side stitches of the buttonhole and is therefore timed according to the side shift of the work clamp slide plate (A3, Fig. 23). The barring cam plate (F3) should be advanced or retarded so that when the work clamp slide plate (A3) has just moved from the side stitches to the centre or barring stitches, the bar tripping point (E3, Fig. 21) will just reach the top of the incline on the front edge of the barring cam plate (F3).

If the barring cam plate (F3) is not correctly set, it will cause the first barring stitch to be made too far to the left of the first row of side stitches, or the last barring stitch to be made too far to the right of the second row of side stitches.

### To Change the Width of the Barring Stitches

The width of the barring stitches is regulated by moving the barring tripping point (E3, Fig. 21) up or down. A very slight movement of the barring tripping point changes the width of the barring stitches considerably.

To increase the width of the barring stitches, turn the driving pulley of the machine by hand until the barring tripping point (E3, Fig. 21) rides upon the top of the barring cam plate (F3, Fig. 21). Now, loosen the screw (G3, Fig. 21) and lower the barring tripping point (E3) as required, after which tighten the screw (G3, loosen the adjusting screw (U2, Fig. 18) and the set screw (T2, Fig. 18) in the opposite end of the same tapped hole, then turn the adjusting screw until there is very little play in the barring slide, after which the set screw should be turned in against the end of the adjusting screw to lock it in position.

To decrease the width of the barring stitches, raise the barring tripping point (E3), then turn the set screw (T2) outwardly to the required position so that it will locate the adjusting screw (U2) and retain the adjustment when the adjusting screw is turned inwardly against the set screw.

### To Time the Feed Wheel Tripping Point

The feed wheel (F2, Fig. 6) is cut to make an equal number of tacking stitches at the start and at the completion of the buttonhole. The feed wheel tripping point (E2, Fig. 6) should be set so that it stops the machine immediately after making the final tacking stitch at the finishing end of the last bar. To adjust the tripping point (E2) to stop the machine earlier, loosen its two set screws and move it forward. To stop the machine later, move the tripping point (E2) backward, then tighten its two set screws. When the tripping point (E2) is correctly set and the buttonhole cutting knife descends to cut the buttonhole, the clamp slide plate (A3, Fig. 23) should be in a central position and the knife slit in the needle plate should be in line with the buttonhole cutting knife.

To time belt shifter, see page 30.

### To Set the Knife Bar

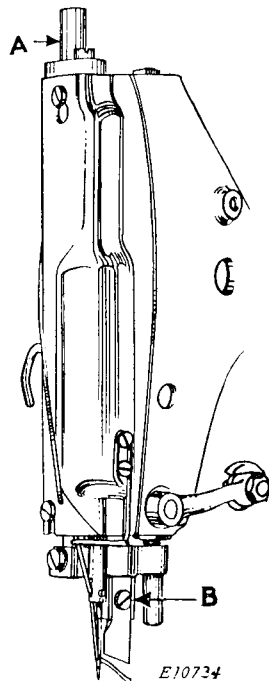


Fig. 22. Adjustment of Knife Bar

Draw the starting lever (K4, Fig. 24) forward out of engagement with the stop cam, hold the knife lever (L4, Fig. 21) down so that the stud in the rear of the knife bar driving lever (M4, Fig. 21) is held against the top end of the slot in the connecting link, as shown at (N4, Fig. 21). Loosen the screw in the knife bar clamp (L, Fig. 19) and adjust the knife bar so that there is a clearance of approximately  $\frac{1}{8}$  inch between the top of the knife bar and the inside of the top of the knife bar stop (A, Fig. 22), then tighten the screw in the knife bar clamp.

The tension on the knife bar driving lever spring (O4, Fig. 21) should be just sufficient to hold the knife bar in its elevated position. Excessive tension on this spring may cause the knife bar to operate with force sufficient to break the knife bar stop.

### To Remove and Replace the Upper Thread Cutting and Clamping Blades

Remove the screw (C3, Fig. 23) from the connecting rod and take out the check holder screw (Z2, Fig. 23), then remove the

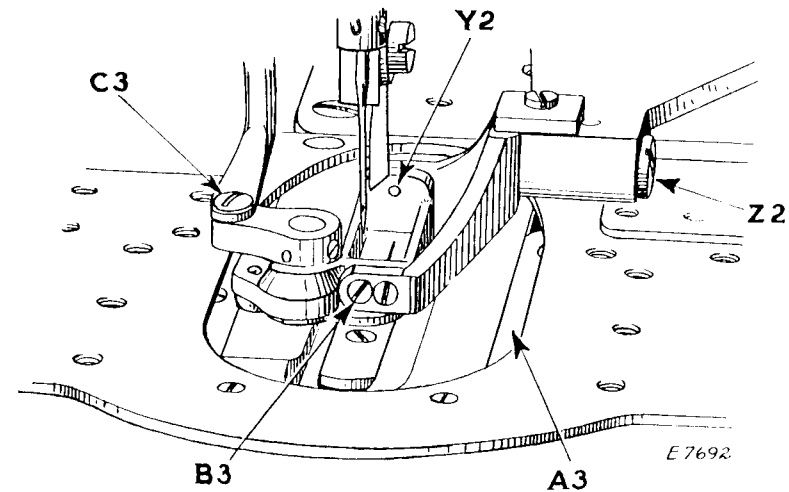


Fig. 23. Adjustments on the Machine

clamp check from the machine. Remove the screw from the underside of the clamp check which holds the clamping and cutting blades in position and remove the blades.

When replacing the blades, place the clamping blade in position first next to the clamp check, then put on the cutting blade and securely fasten both blades in position by means of the screw, being careful to set the clamping blade about  $\frac{1}{8}$  inch in advance of the cutting blade. Then fasten the clamp check to the machine by means of the two screws (Z2 and C3, Fig. 23).

When the clamp check is in position on the machine, the back edge of the cutting blade should be flush with the front edge of the opening in the clamp check. The cutting blade can be set in this position by loosening the two screws (A, Fig. 5) and moving the clamp arm forward or backward, as may be required, after which securely tighten the two screws (A).

See page 19 for special instructions to be given operators.

### To Remove and Replace the Under Thread Cutting Blade

Turn the machine over on its hinges and remove the two screws (X2, Fig. 20) which hold the under thread cutting blade in position on the underside of the bed, then remove the cutting blade. Place the new cutting blade in position with its cutting edge between the under thread pull-off finger and the needle plate, as shown in Fig. 20, and replace the two screws. Lower the cutting blade as far as it will go and adjust it straight, then securely fasten it in position by means of the two screws (X2).

### To Regulate the Tension on the Stop Motion Interlocking Rod

The tension on the stop motion interlocking rod (F, Fig. 7) should only be sufficient to prevent this rod from jumping out of the notch in the stop cam and sufficiently strong to retard the motion of the arm shaft before finally stopping the machine, thus minimizing the possibility of breaking the stop cam gear spring.

When making buttonholes in heavy fabrics, it may be necessary to lighten the tension on the interlocking rod. To do this, loosen the lock nut (Q3, Fig. 24) and turn down the screw (P3, Fig. 24) until the desired tension is obtained, then securely tighten the lock nut (Q3).

When making buttonholes in light weight fabrics, it may be necessary to increase the tension on the interlocking rod (F, Fig. 7) by turning up the screw (P3, Fig. 24) until the desired tension is obtained.

**Note:** When the stop cam interlocking rod rides on the highest point of the stop cam, the lock pin (S3, Fig. 24) should be  $\frac{1}{16}$  inch above the stop cam interlocking rod guide (R3, Fig. 24). If it is not, loosen the lock nut (T3, Fig. 24) in the tension releaser lever and turn the adjusting screw (U3, Fig. 24) in or out, as may be required, then securely tighten the lock nut (T3).

### To Remove and Replace the Stop Cam Gear Spring

In case the stop cam gear spring, which is enclosed in the stop cam gear, should become broken, it can be removed and a new spring inserted in its place as follows:

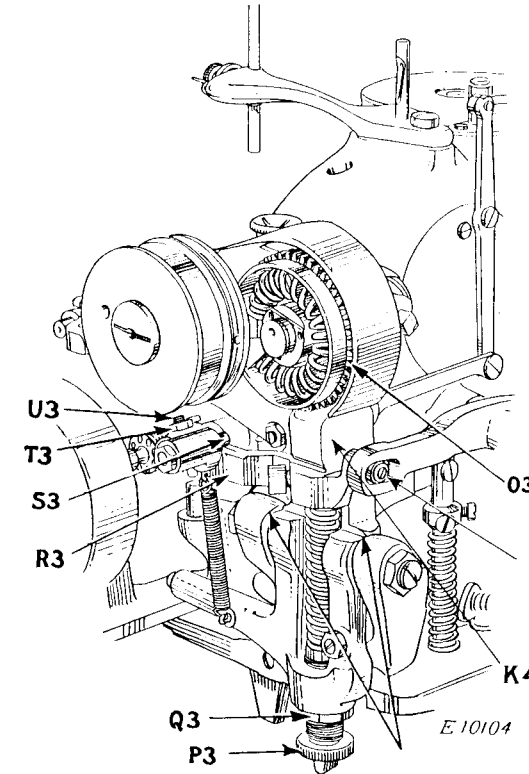


Fig. 24. Showing Spiral Spring in Position in Stop Cam Gear

To remove the spring from the stop cam gear, take out the three screws which fasten the cover to the stop cam gear, then remove the cover. Turn the driving pulley of the machine by hand until the stop cam gear (O3, Fig. 24) is in the position shown in Fig. 24, then remove the spring from the stop cam gear.

Place the new spring in position in the stop cam gear, inserting the ends of the spring first.

After the spring is replaced, grease it with Singer High Speed Lubricant. This will lengthen the life of the spring. Then replace the cover on the stop cam gear and securely fasten it in position by means of the three screws.

### To Adjust the Clamp Lock Mechanism

The clamp lock is designed to prevent the raising of the work clamp while the buttonhole is being stitched.

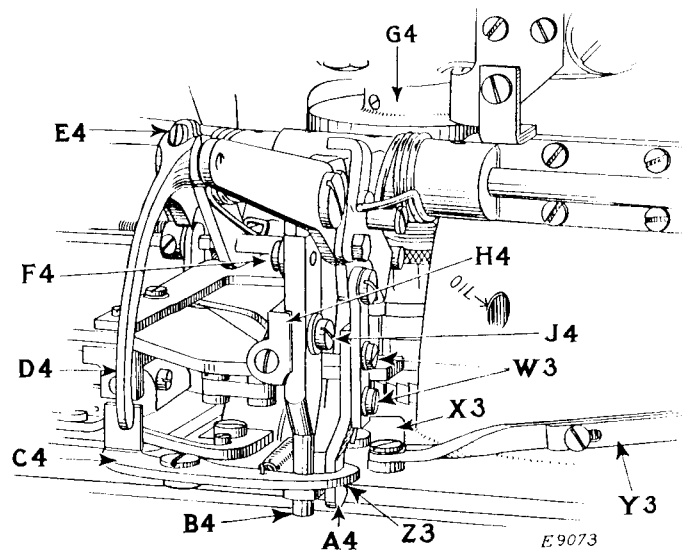


Fig. 25. Locking Mechanism Engaged

When the machine reaches the stopping position, the tripping lever (D4, Fig. 25) should throw the clamp lifting arm connection lock (C4, Fig. 25) out of the notch in the clamp lifting arm connection (B4, Fig. 25), and it should also release the needle thread cutting lever lock (A4, Fig. 25).

To adjust the tripping lever (D4, Fig. 25), loosen the clamping screw (E4, Fig. 25) and set the tripping lever (D4) so that it moves the clamp lifting arm connection lock (C4) about  $\frac{1}{8}$  inch beyond the clamp lifting arm connection (B4), as shown in Fig. 26, then securely tighten the clamping screw (E4).

To adjust the clamp lifting arm connection (B4, Fig. 25), loosen the screw (J4, Fig. 25) in the roller stud bracket (H4, Fig. 25), then loosen the clamping screw (F4, Fig. 25) and raise or lower the clamp lifting arm connection (B4) so that the notch in the lower end of the connection (B4) will be in line with the lock (C4, Fig. 25), then securely tighten the clamping screw (F4). Reset the roller stud bracket (H4) and securely tighten the screw (J4).

### To Adjust the Needle Thread Cutting Lever Lock

The cutting lever lock (A4, Fig. 26) is designed to prevent the operation of the needle thread trimmer while the buttonhole is being stitched.

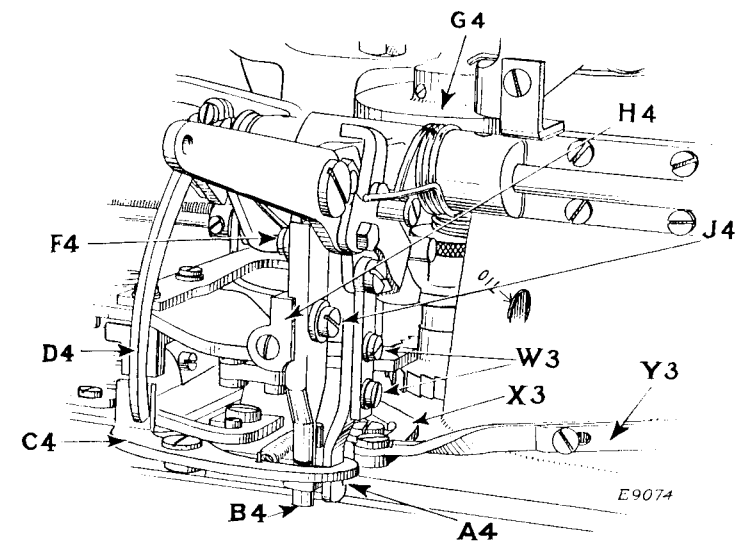


Fig. 26. Locking Mechanism Disengaged

When the machine is in sewing position, the needle thread cutting lever lock (A4, Fig. 26) should just lock under the needle thread cutting lever bracket, as shown at Z3, in Fig. 25.

To adjust the needle thread cutting lever lock (A4, Fig. 26), loosen the two clamping screws (W3, Fig. 26) and raise or lower the lock (A4), as required, then tighten the clamping screws (W3).



Having sharpened one side of the knife, set knife stop "L" against lower end of knife and securely tighten screw "K". Withdraw the knife and replace it with the unsharpened side downward, then retighten the screw "D". It will then be necessary to change the position of the turret "E" to suit the angle of the reversed knife. If the turret has been set at "A" it should be moved to the other "A"; if at "B" to the other "B"; and if at "C" to the other "C". When the turret is moved to the correct position it should be securely fastened by the screw "G". Care should be taken to see that the knife is held securely against the stop and the turret properly set, thus assuring the proper bevel, equally made on both sides, with the cutting edge central.

When the knife has been ground it should be rubbed a little on an oil stone.

To oil the grinder push aside the cover "M" and put oil in the two oil holes thus uncovered.

Chart Showing Position of Turret When Grinding  
Various Knives

No. of Knife	Length	Position of Turret	No. of Knife	Length	Position of Turret
23443	$\frac{1}{4}$	B	23450	$\frac{11}{16}$	B
23444	$\frac{1}{8}$	B	23451	$\frac{3}{4}$	B
23445	$\frac{3}{8}$	B	23452	$\frac{13}{16}$	A
23446	$\frac{7}{8}$	B	23453	$\frac{7}{8}$	A
23447	$\frac{1}{2}$	B	23454	$\frac{15}{16}$	A
23448	$\frac{9}{16}$	B	23455	1	A
23449	$\frac{5}{8}$	B			