

SINGER
71-101,71-107

USE SINGER* OILS and LUBRICANTS

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

The following are the correct lubricants for this machine:

TYPE B — MANUFACTURING MACHINE OIL, HEAVY GRADE

When an oil is desired which will produce a minimum of stain on fabrics, even after a long period of storage, use:

TYPE D — MANUFACTURING MACHINE OIL, HEAVY GRADE

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. Furnished in 1 lb. and 4 lb. tins.

OTHER SINGER* LUBRICANTS

TYPE E — THREAD LUBRICANT

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

TYPE F — MOTOR OIL

For oil lubricated motors and plain bearings in power tables and transmitters.

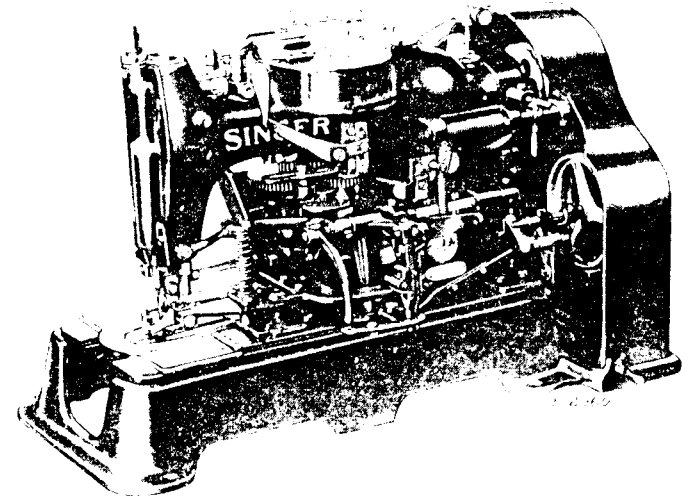
NOTE: All of the above oils are available in 1 quart, 1 gallon and 5 gallon cans.

GEAR LUBRICANT

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

2174w

INSTRUCTIONS FOR USING AND ADJUSTING SINGER* SEWING MACHINES



71-101 and 71-107

HIGH SPEED

GEAR DRIVEN FEED

THE SINGER MANUFACTURING COMPANY

*A Trademark of THE SINGER MANUFACTURING COMPANY

DESCRIPTION

Machines 71-101 and 71-107 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 $\frac{3}{4}$ to $\frac{1}{2}$ 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.

Unless otherwise ordered, the 71-101 machine will be sent out fitted with a $\frac{3}{4}$ inch knife and three additional knives for $\frac{3}{4}$, $\frac{1}{2}$ and $\frac{3}{8}$ inch buttonholes.

Machine 71-107 makes purl stitch buttonholes with square barred ends, the hole being cut from $\frac{3}{4}$ to $1\frac{1}{2}$ inches long. Both threads and the buttonhole are cut after stitching.

Unless otherwise ordered, the 71-107 machine will be sent out fitted with a $1\frac{1}{2}$ inch knife and three additional knives for 1, $1\frac{1}{4}$ and $1\frac{1}{2}$ inch buttonholes.

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

40028 Shuttle Body

Stitch Regulating Gears for Whip Stitch

For Machine 71-101	For Machine 71-107
249682 - 30 Teeth	249677 - 20 Teeth
249725 - 36 "	249679 - 24 "
249727 - 40 "	249682 - 30 "
249744 - 45 "	249725 - 36 "

For other gears and specifications see page 16.

Speed

The maximum speed recommended is 2000 stitches per minute. When the machines are in operation, the tight machine pulley should turn over to the left as indicated by the arrow in Fig. 5.

To Set Up Machines on SINGER* Universal Power Tables

The machine is usually set so that its face plate is toward the edge of the table nearest the operator, about midway between the leg sections.

Front Edge of Table

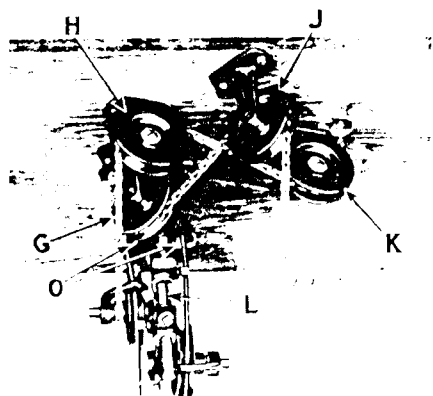


Fig. 2. Underside of Power Table, showing Belt and Chain Guides for Low Shaft Drive

One hole should be bored for the chain to connect with the lever (B, Fig. 5) and another hole for the chain to connect with the starting lever (D2, Fig. 6).

There are four treadle chain pulleys (G, H, J and K, Fig. 2), each consisting of a bracket and a single pulley. Fasten one of these pulleys (K, Fig. 2) to the underside of the table directly below the clamp lifting lever (B, Fig. 5) and in line with the chain adjusting slide on the left hand treadle. Fasten the second pulley (H) to the underside of the table directly over the chain adjusting slide and in line with the first pulley (K). Fasten the pulley (G, Fig. 2) to the underside of the table directly below the starting lever (D2, Fig. 6) and in line with the chain adjusting slide on the right hand treadle. Fasten the fourth pulley (J, Fig. 2) to the underside of the table directly over the chain adjusting slide on the right hand treadle and in line with the pulley (G).

Pass one chain from the left treadle straight up and over the pulley (H) and under the pulley (K), then up through the hole

in the table and fasten to the clamp lifting lever (B, Fig. 5). Pass the second chain from the right treadle straight up and over the pulley (J) and under the pulley (G), then up through the hole in the table and fasten to the starting lever (D2, Fig. 6).

If the machine is to be driven by a pulley mounted on either a floor or table shaft to the rear of the idler bracket complete (L), the idlers and idler arm should be assembled with the pulleys mounted in the two holes of the arm farthest from the vertical rod hole, as shown at N, Fig. 3. Should it be necessary to drive the machine from a shaft lying between the rear of the machine and the front of the table, the two pulleys should be assembled with the pulleys mounted in the holes of the arms nearest to the vertical rod hole, as shown at M, Fig. 3.

Two belt holes (O, Fig. 2) should be bored in the table directly below the tight machine pulley according to the location shown by the blueprint furnished with the machine and the belt idler (L, Fig. 2) mounted on the underside of the table directly below these two holes (O). The belt should be applied around the pulley on the shaft, around the idlers, up through the holes (O) in the table and around the machine pulley as instructed on page 19.

To Set Up Machines on Universal Power Tables with SINGER* Electric Motor

The foregoing instructions should be followed with the exception that the belt idlers (L, Fig. 3) and arms must be assem-

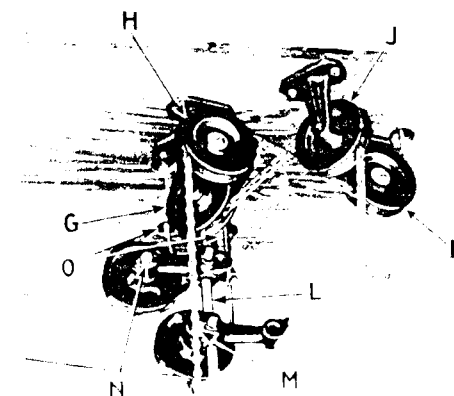


Fig. 3. Underside of Table, Showing Location of Idler and Treadle Chain Guides for Individual SINGER Electric Motor Operation of Class 71+ Machines

bled as illustrated in Fig. 3. The belt should be applied around the pulley of motor, around the idlers, up through the holes (O, Fig. 3) in the table and around the machine pulley as instructed on page 19.

Machines Run in Pairs

When machines are run in pairs and driven from a table or floor shaft, they must have belt and belt idlers installed the same as two individual machines and the chain pulleys mounted according to the blueprint furnished with the machine.

To install one motor for driving two machines run in pairs, the motor should be mounted directly below the center line between the two machines with the tight machine pulley towards the front of the table as illustrated in Fig. 4. The belt idler pulleys (R, Fig. 4) must be mounted on their arms (S) as illustrated in Fig. 4 and the chain pulleys mounted according to the blueprint furnished with the machine. When individual motors are used for each machine in pairs, there are no belt idlers used under the table and the motors are set directly below the machine pulley and on the same angles that each machine is set with respect to the table.

For applying belt see instructions on page 19.

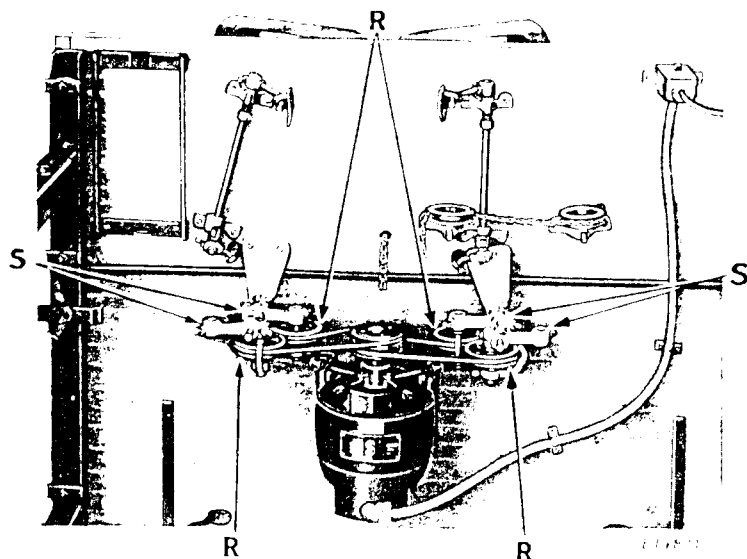


Fig. 4. Underside of Table, Showing Location of Idlers, Treadle Chain Guides and SINGER Electric Transmitter Motor for Class 71- Machines when Operated in Pairs

To Oil the Machine

Use **"TYPE B"** or **"TYPE D" OIL**, sold by Singer Sewing Machine Company. For description of these oils, see inside front cover of this book.

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

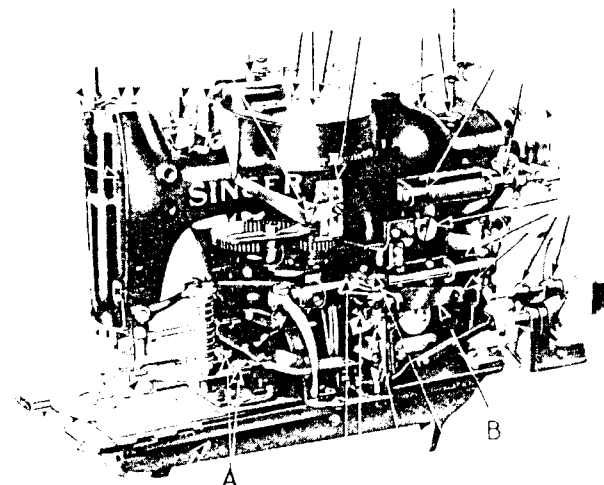


Fig. 5. Oiling Points at the Right of the Machine Also Adjustments on the Machine

the places designated by the unmarked arrows in Figs. 5, 6, 7, 21 and 26. 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 important to use either of the above heavy grades of oil for the feed gears and stop motion mechanism in the rear of the machine.

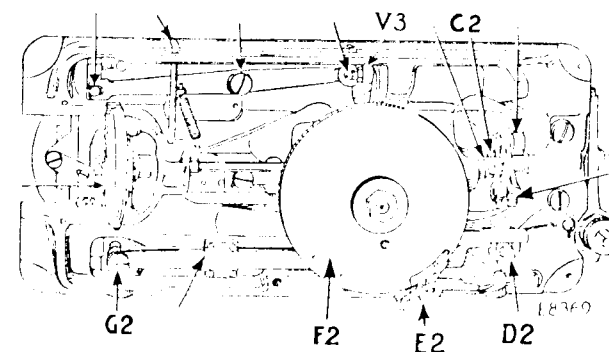


Fig. 6. Oiling Points in the Base of the Machine Also Adjustments on the Machine

To reach the parts underneath the bed plate, throw the belt off the machine pulley, disconnect the starting and clamp lifting chains, then turn the machine over on its hinges.

Occasionally remove the screw (G, Fig. 7) from the loose pulley and apply a small quantity of BALL BEARING LUBRICANT to the ball bearing of the pulley through the tapped hole, using BALL BEARING LUBRICANT sold by Singer Sewing Machine Company, then replace the screw (G).

Oil the shuttle bearing at the places indicated by the unlettered arrows in Fig. 21, Page 23, once each day.

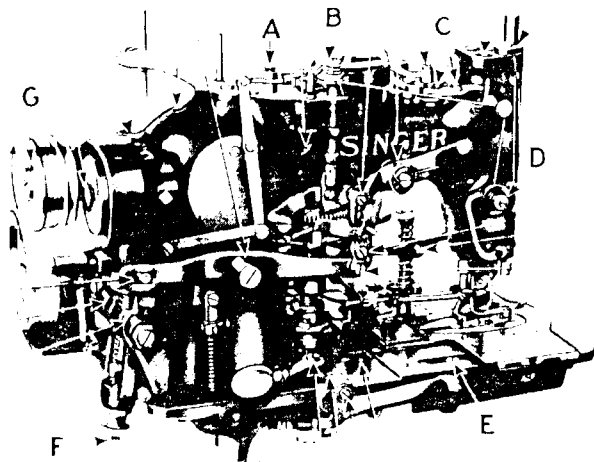


Fig. 7. Oiling Points at the Left of the Machine
Also Adjustments on the Machine

Needles

Needles for Machines 71-101 and 71-107 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 needles sold by 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.

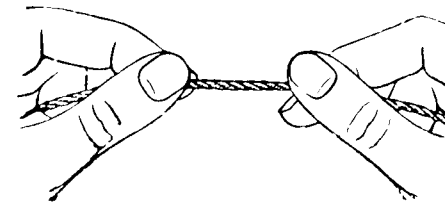


Fig. 8. How to Determine the Twist

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 take 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 downward and the bobbin will drop out.

To Wind the Bobbin

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

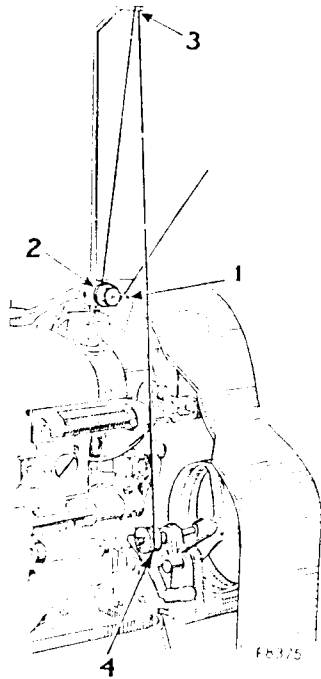


Fig. 9. Winding the Bobbin

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

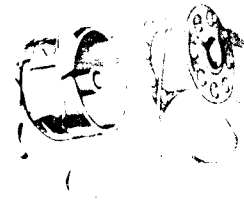


Fig. 10

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.

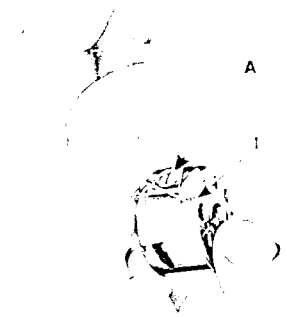


Fig. 11

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.

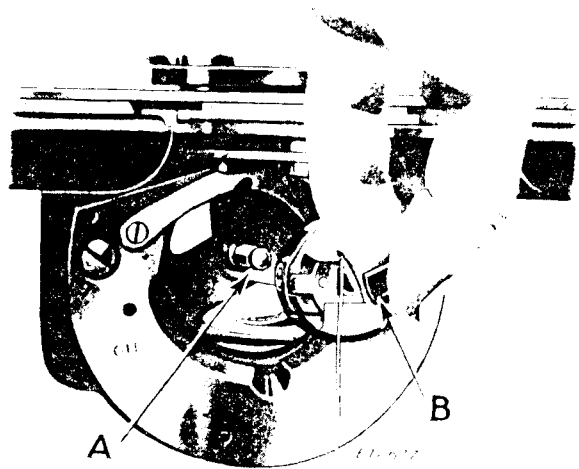


Fig. 13. Replacing the Bobbin Case

Place the bobbin case on the center 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, down 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 begin sewing.

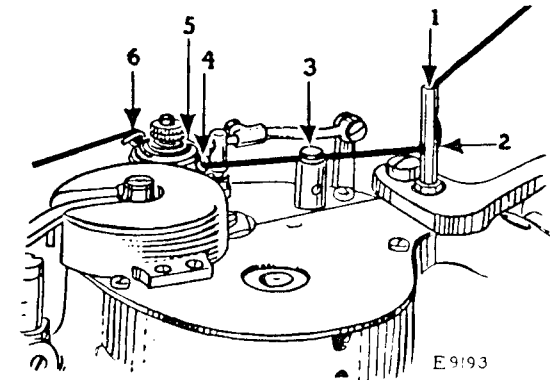


Fig. 14. Upper Threading of Machines

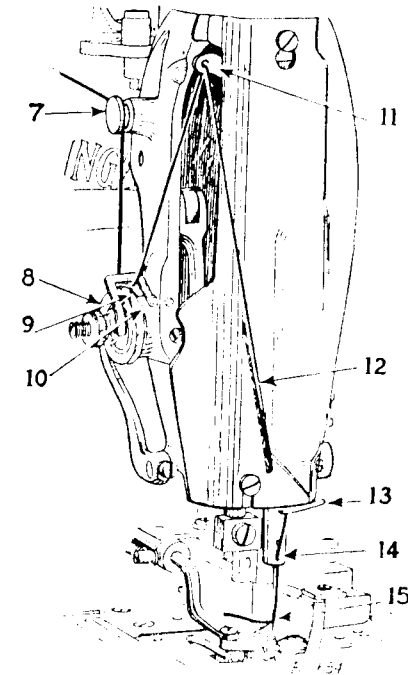


Fig. 15. Upper Threading of Machines

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:

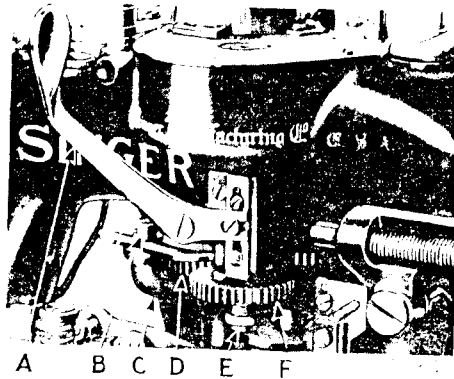


Fig. 16. Mechanism for Disengaging Stitch Regulating Gear

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

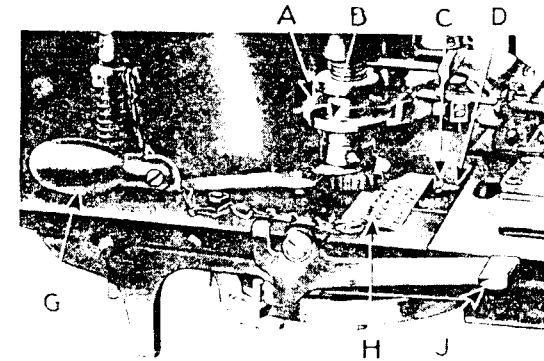


Fig. 17. Showing How to Regulate Length of Buttonhole

according to the style of bar 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 downward 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 for Machine 71-101

Gear Number	Number of Teeth	Needle Dips per Buttonhole to Rev. of Feed Wheel	FEED WHEEL					
			‡249802			249841		
			Counting Stitches	Bar Stitches	Blind Stitches	Counting Stitches	Bar Stitches	Blind Stitches
249675	18	200	83	10	14	88	6	12
*249677	20	180	75	9	12	79	6	10
*249679	24	150	62	8	10	66	5	8
†249682	30	120	50	6	8	52	4	8
*249725	36	100	41	5	8	44	3	6
249727	40	90	37	5	6	40	3	4
249744	45	80	33	4	6	35	3	4
249897	50	72	30	3	5	32	2	4
249953	60	60	25	3	4	26	2	4

With Feed Wheel 249802 use Barring Plates 249801 and 249804.
Use two 249842 Barring Plates with Feed Wheel 249841.

Stitch Regulating Gears for Machine 71-107

Gear Number	Number of Teeth	Needle Dips per Buttonhole to Rev. of Feed Wheel	Feed Wheel		
			Counting Stitches	‡249973 Bar Stitches	Blind Stitches
*249675	18	300	136	8	12
*249677	20	270	122	8	10
†249679	24	225	102	6	9
*249951	27	200	91	5	8
249682	30	180	81	4	8
249725	36	150	68	4	6
249727	40	135	61	4	5
249744	45	120	55	3	4
249897	50	108	49	3	4
249952	54	100	45	3	4
249953	60	90	41	2	4

With Feed Wheel 249973 use two Barring Plates 249954.

*Regular equipment, unless otherwise ordered.

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

Blind Stitches plus twice the sum of Counting Stitches and Bar Stitches is equal to the Needle Dips per Revolution of Feed Wheel. For example, with Gear 249675 and Feed Wheel 249802—

$$14 + 2(83 + 10) = 200$$

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 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 produce perfect purl stitch buttonholes, it is recommended to use the stitch regulating gears listed above for either the 71-101 or 71-107 machines.

For production reasons, other stitch regulating gears having a greater or less number of teeth may be used. However, there may

be a slight and occasional misalignment of stitch formation when leaving the first bar. This defect in many cases is not objectionable in purl stitch buttonholes and is not noticeable when making whip stitch buttonholes.

To Regulate the Tensions

Machines 71-101 and 71-107 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 24.

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

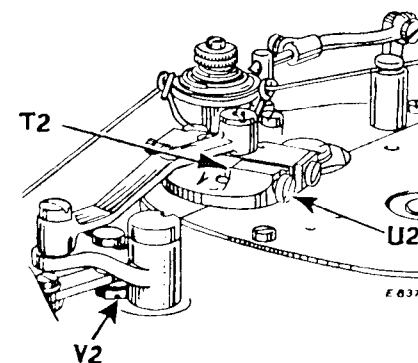


Fig. 18

Adjustments on the Machine

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 tight machine pulley by hand until the bar tripping point (E3, Fig. 22) rides upon the top of the barring plate (F3, Fig. 22). Loosen the adjusting screw (U2, Fig. 18) and 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 Adjust the Knife Slit in the Needle Plate

When the knife descends to cut the buttonhole, it must enter exactly in the center of the slit in the needle plate. In case the knife does not enter in the center 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 center 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 toward the back of the slot. To make the cutting space narrower, move the screw toward you in the slot, then tighten the screw.

When making buttonholes in either light or heavy material, 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 to throw the needle slightly more to the left. If 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. 24) 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.

NOTE. These machines are equipped with a safety device which makes it unnecessary to apply pressure to the clamp lifting device to trip the upper thread trimmer blades in the event the machine is run a second time for re-enforcing a buttonhole.

To Apply Belt Idler Pulley Bracket and Belt

The belt idler shown in Fig. 19 prevents damage to the machine in case the belt is applied to drive the arm shaft in the wrong direction of rotation. It instantly forces the belt onto the loose machine pulley, avoiding improper operation of the machine.

firmly attach the idler bracket to the stud at the rear of the machine as shown in Fig. 19, by means of the set screw (A) at the side and the set screw (B) underneath the bracket, pushing the bracket to the right as far as possible so that it rests against the stop.

Since the improved 71-Class machines have a gear driven feed, it is imperative that the arm shaft be turned in the direction of the arrow on the pulley in Figs. 19 and 26. Therefore the belt should lead from the driving side of the shaft or motor pulley to the left hand pulley of the idler (I, Fig. 2), up through the table to the idler pulley and through the guiding hole as shown in Fig. 19, up and over the top of the loose machine pulley (C3, Fig. 26), downward through the belt shifter (B3, Fig. 26), through the table, around the right hand pulley of idler (I) beneath the table, and back to the motor pulley. The belt idler is so located that should the belt run in the wrong direction, it will force the belt from the tight machine pulley (W3, Fig. 26) to the loose machine pulley (C3). Whenever the arm shaft is turned over by hand, it should be turned in the direction of the arrow shown in Figs. 19 and 26.

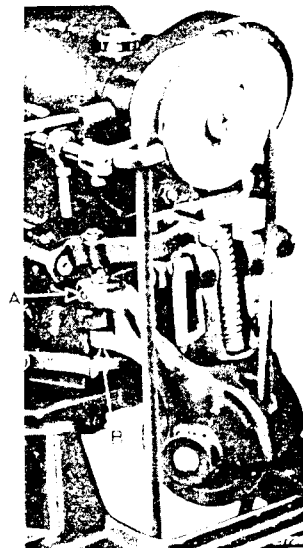


Fig. 19. Rear View of Gear Feed 71-Class Machine

INSTRUCTIONS
FOR
ADJUSTERS AND MECHANICS

To Set the Needle Bar at the Correct Height

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

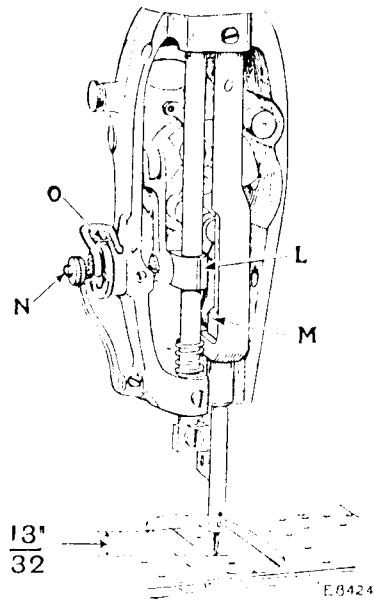


Fig. 20. Showing Correct Height of Needle Bar

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. 20. 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. 20). (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 tight machine pulley until the needle bar on its left hand throw has moved down to its lowest point and has

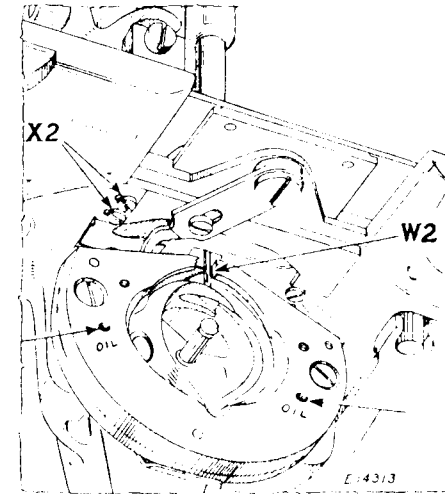


Fig. 21. Showing Shuttle Correctly Timed

risen about $\frac{1}{10}$ inch. When the needle bar is in this position, the point of the shuttle should be at the center 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. 21. The correct timing of the shuttle is obtained by carefully tightening the upper screw (C2, 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 be only 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. 20) 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. 20) 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 71-107, which make purl stitch buttonholes with square barred ends, use both of the tensions (J2, Fig.

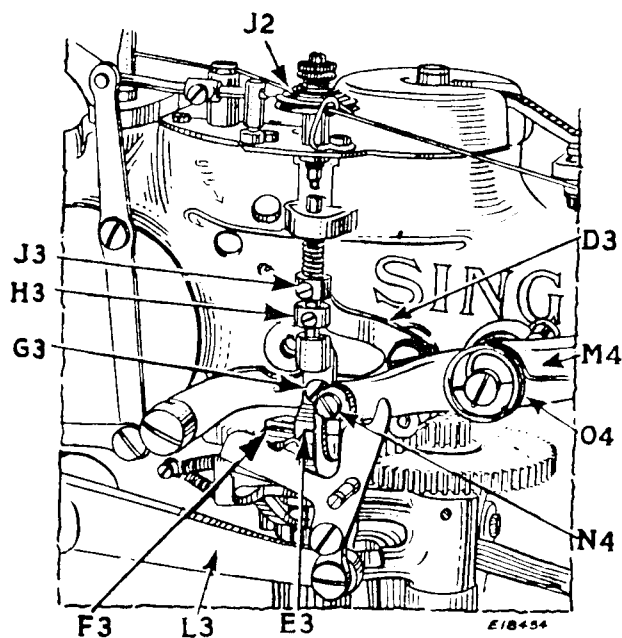


Fig. 22. Adjustments on Machines for Making Purl Stitch Buttonholes with Square Bars

22 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. 22) is released when the bar tripping point (E3, Fig. 22) is raised by the bar cam plate (F3, Fig. 22), 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. 22) 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. 22) 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 Position the Needle Vibrating Mechanism

To correctly position the needle vibrating mechanism, set the arm shaft bevel gear (H, Fig. 23) and the intermittent feed

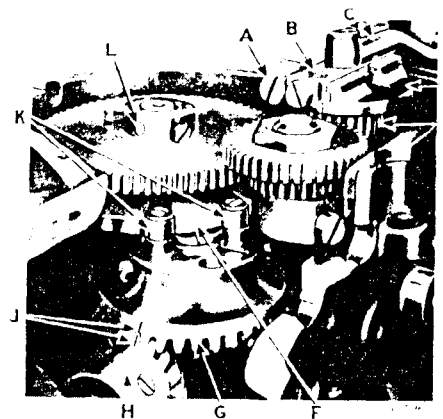


Fig. 23. Needle Vibrating Driving Mechanism

driving gear (G) so that their timing marks (J) register with each other as shown above, at which point the driving studs (K) should be on a dead position of the intermittent wheel (F), which is determined by having the dowel pin (L) face toward the tight machine pulley, as shown. While the gears (G and H) are in this position, the head (D) of the barring shaft should be set so that the adjustable crank slide (B) is approximately in line with the link (C) when the adjusting screw (A) is toward the tight machine pulley and nearly parallel with the center line of the machine. If the crank slide (B) and link (C) are not set in the correct position in relation to the gears (G and H) as described above, re-mesh the gear (E) to bring the mechanism to the required position as stated above.

Improper timing of the gears (G and H) will cause deflection of the needle to or away from the shuttle, resulting in breakage of thread or needle.

Incorrect position of the barring shaft head (D) will cause:

1. Imperfect stitching, particularly distortion of the barring stitches.
2. Misalignment of stitching with buttonhole cutting knife.

To Set the Barring Cam Plate

The barring cam plate (F3, Fig. 22) 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. 25). 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 center or barring stitches, the bar tripping point (E3, Fig. 22) 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. 22) 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 tight machine pulley by hand until the barring tripping point (E3, Fig. 22) rides upon the top of the bearing cam plate (F3, Fig. 22). Now, loosen the screw (G3, Fig. 22) and lower the barring tripping point (E3) as required. Then 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. Turn the adjusting screw until there is very little play in the barring slide, then turn the set screw 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) out to the required position so that it will locate the adjusting screw (U2) and retain the adjustment when the adjusting screw is turned in 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. 25) 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 33.

To Set the Knife Bar

Draw the starting lever (K4, Fig. 26) forward out of engagement with the stop cam. Hold the knife lever (L3, Fig. 22) down so that the stud in the rear of the knife bar driving lever (M4, Fig. 22) is held against the top end of the slot in the connecting link, as shown at (N4, Fig. 22). Loosen the screw in the knife bar clamp (L, Fig. 20) 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. 24). Then tighten the screw in the knife bar clamp.

The tension on the knife bar driving lever spring (O4, Fig. 22) 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.

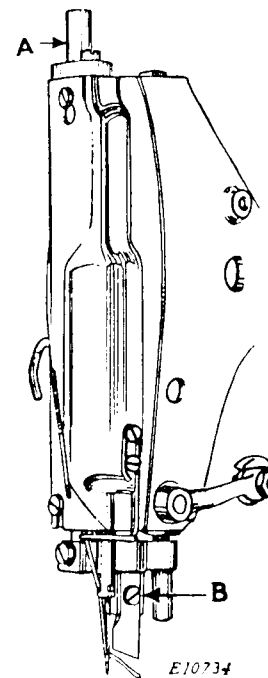


Fig. 24. Adjustment of Knife Bar

To Remove and Replace the Upper Thread Cutting and Clamping Blades

Remove the screw (C3, Fig. 25) from the connecting rod and take out the check holder screw (Z2, Fig. 25). Then remove the

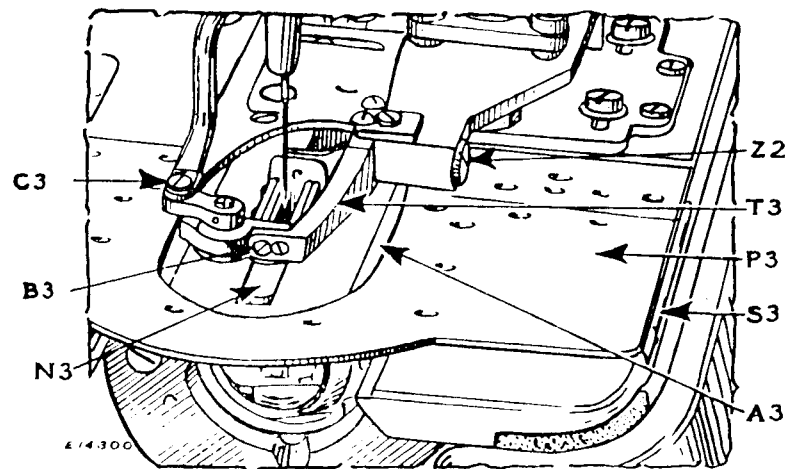


Fig. 25. Adjustments on the Machine

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, first place the clamping blade in position next to the clamp check, then apply the cutting blade and securely fasten both blades in position by means of the screw, being careful to set the clamping blade about $\frac{1}{16}$ 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. 25).

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. Then securely tighten the two screws (A).

To Remove and Replace the Under Thread Cutting Blade

Turn the machine over on its hinges and remove the two screws (X2, Fig. 21) 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. 21, 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. 26) 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. 26) and turn down the screw (P3, Fig. 26) 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. 26) by turning up the screw (P3, Fig. 26) 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. 26) should be $\frac{1}{8}$ inch above the stop cam interlocking rod guide (R3, Fig. 26). If it is not, loosen the lock nut (T3, Fig. 26) in the tension releaser lever and turn the adjusting screw (U3, Fig. 26) 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:

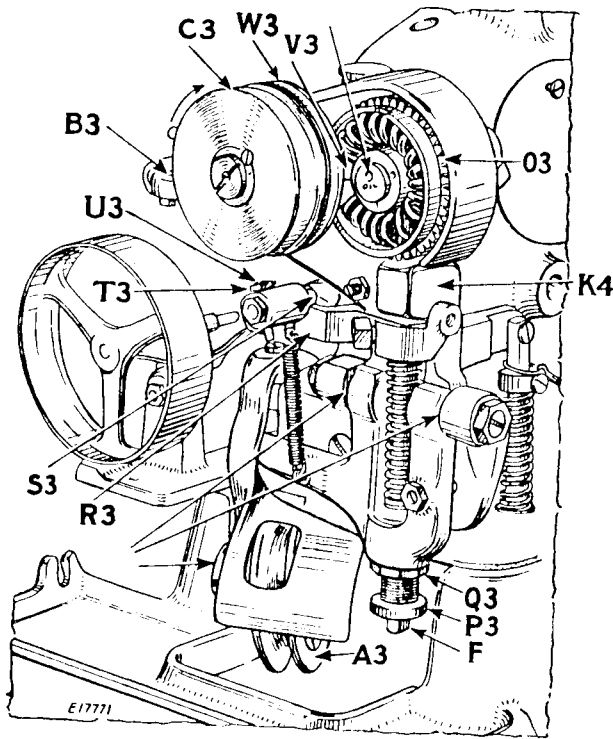


Fig. 26. Showing Spiral Spring in Position in Stop Cam Gear

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 tight machine pulley by hand until the stop cam gear (O3, Fig. 26) is in the position shown in Fig. 26, 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 GEAR LUBRICANT sold by Singer Sewing Machine Company. 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.

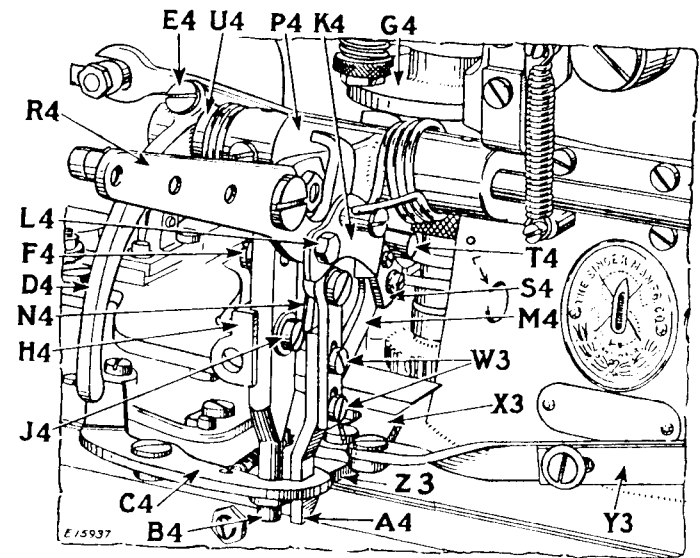


Fig. 27. Locking Mechanism Engaged

When the machine reaches the stopping position, the tripping lever (D4, Fig. 27) should throw the clamp lifting arm connection lock (C4, Fig. 27) out of the notch in the clamp lifting arm connection (B4, Fig. 27), and it should also release the needle thread cutting lever lock (A4, Fig. 27).

To adjust the tripping lever (D4, Fig. 27), loosen the clamping screw (E4, Fig. 27) and set the tripping lever (D4) so that it moves the clamp lifting arm connection lock (C4) about $\frac{1}{16}$ inch beyond the clamp lifting arm connection (B4), as shown in Fig. 28, then securely tighten the clamping screw (E4).

To adjust the clamp lifting arm connection (B4, Fig. 27), loosen the screw (J4, Fig. 27) in the roller stud bracket (H4, Fig. 27), then loosen the clamping screw (F4, Fig. 27) 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. 27), 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. 28) is designed to prevent the operation of the needle thread trimmer while the buttonhole is being stitched.

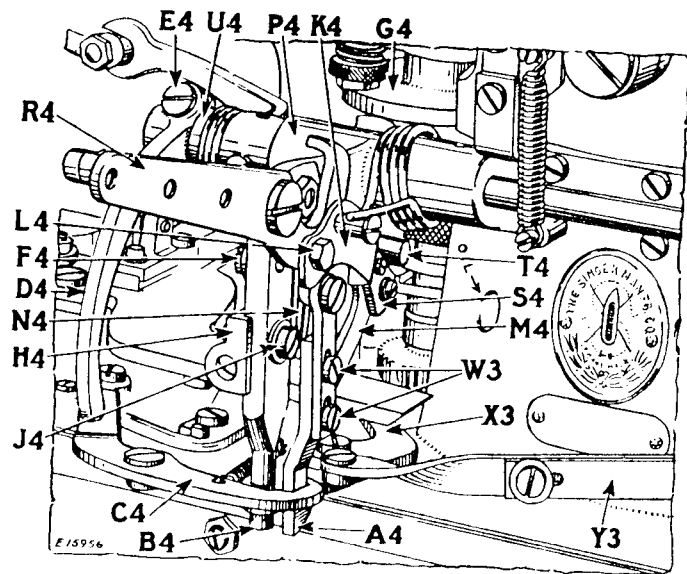


Fig. 28. Locking Mechanism Disengaged

When the machine is in sewing position, the needle thread cutting lever lock (A4, Fig. 28) should just lock under the needle thread cutting lever bracket, as shown at Z3, in Fig. 27.

To adjust the needle thread cutting lever lock (A4, Fig. 28), loosen the two clamping screws (W3, Fig. 28) and raise or lower the lock (A4), as required, then tighten the clamping screws (W3).

To Regulate the Tripping of the Upper Thread Cutting and Clamping Blades

First, set lever (K4, Figs. 27 and 28) by loosening screw (L4, Figs. 27 and 28) and adjust the long tail end (M4, Fig. 27) so that the sewing safety lock (X3, Fig. 27) is in line with back edge of downward projecting arm (N4, Fig. 27) of the thread lower cutting lever (P4, Fig. 27) and the lever (R4, Fig. 27) is lifted to its extreme position by the sewing safety lock (X3, Fig. 27), then tighten the screw (L4, Fig. 27).

Second, adjust the plate (S4, Fig. 27) to or from the stud (T4, Fig. 27) to trip the thread (upper) cutting blade connecting rod latch (U4, Fig. 27) so that the upper thread cutter of mechanism (C3, Fig. 25) is tripped and upper thread is trimmed before the work clamp check (Fig. 25) raises from the material.

To Adjust the Sewing Safety Lock

The sewing safety lock (X3, Fig. 28) is designed to prevent the operation of the bobbin thread trimmer while the buttonhole is being stitched.

When the machine is in sewing position, the sewing safety lock (X3, Fig. 28) should rest against the thread (lower) cutting lever (V3, Fig. 6) above the bed of the machine.

To set the sewing safety lock (X3, Fig. 28) in this position, loosen the two screws in the safety lock pitman (Y3, Fig. 28) and move the forward end of the pitman, as required, then securely tighten the two screws.

To Time the Belt Shifter

The disc (G4, Fig. 28), upon which the belt shifter tripping point is mounted, should be set so that it causes the belt shifter to move the belt from the tight machine pulley to the loose machine pulley **not less than two stitches** before the interlocking rod drops into one of the notches in the stop cam. To change the timing of the belt shifter, loosen the two set screws in the disc (G4) and turn the disc forward to trip the belt shifter earlier or backward to trip it later, then tighten the two set screws.

Care must be taken not to turn the disc (G4) so that the belt shifter tripping point is advanced too far. If the tripping point is advanced too far, the machine will not have sufficient momentum to permit the interlocking rod to climb the incline on the stop cam.

Caution: When changing the stitch regulating gear and length of buttonhole and timing feed wheel tripping point, it may be necessary to reset the disc (G4, Fig. 28) so that the belt shifter will operate at the correct time, as instructed above.

INSTRUCTIONS
FOR USING
KNIFE GRINDER 701w51

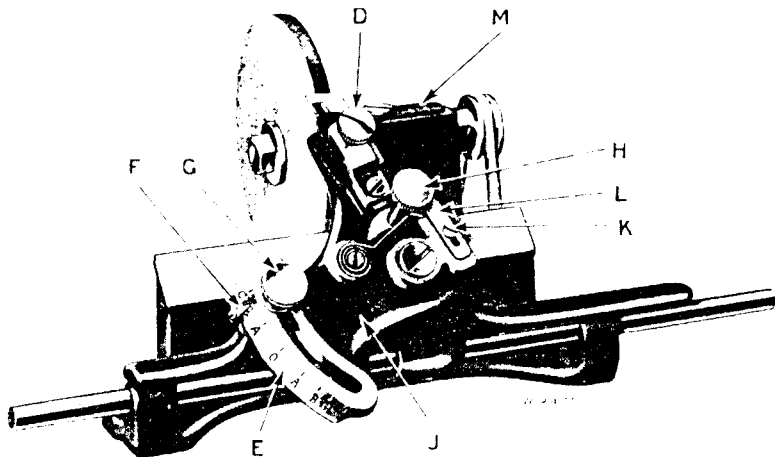


Fig. 29. Knife Grinder 701w51

The grinder should be set to turn away from the knife at a speed of about 2500 revolutions per minute. Clamp the knife in the holder as shown in the illustration and firmly tighten the clamping screw "D". To set the knife at the correct angle on the grinder, refer to the list on the following page to ascertain which of the letters "A," "B" or "C" on the turret "E" is to be brought into line with the pointer "F," the cutting edge of the knife being horizontal, then tighten the screw "G".

Start the grinder and turn the adjusting screw "H" to adjust the cutting edge of the knife so that it will barely graze the wheel while moving the sliding bracket "J" once to the right and left. **The least possible amount ground off is usually sufficient.** If more than a slight amount of the edge is ground off at one movement the temper of the knife may be drawn until it is too soft for use.

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	$\frac{1}{2}$	B	23454	$1\frac{1}{8}$	A
23444	$1\frac{1}{8}$	B	23455	1	A
23445	$\frac{3}{8}$	B	23456	$1\frac{1}{8}$	A
23446	$1\frac{1}{8}$	B	23457	$1\frac{1}{8}$	A
23447	$\frac{1}{2}$	B	23458	$1\frac{1}{8}$	A
23448	$1\frac{1}{8}$	B	23459	$1\frac{1}{8}$	A
23449	$\frac{3}{8}$	B	39555	$1\frac{1}{8}$	A
23450	$1\frac{1}{8}$	B	39556	$1\frac{1}{8}$	A
23451	$\frac{3}{4}$	B	39557	$1\frac{1}{8}$	A
23452	$1\frac{1}{8}$	A	39558	$1\frac{1}{8}$	A
23453	$\frac{3}{8}$	A			