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ADJUSTERS MANUAL

FOR

SINGER MACHINES

101-3 AND 101-11

WITH S.U. AND S.E. MOTORS
AND CARBON CONTROLLERS

(For Machines 101-1, 101-2 and 101-10 with Wire-Wound Resistances
See Adv. 1856)



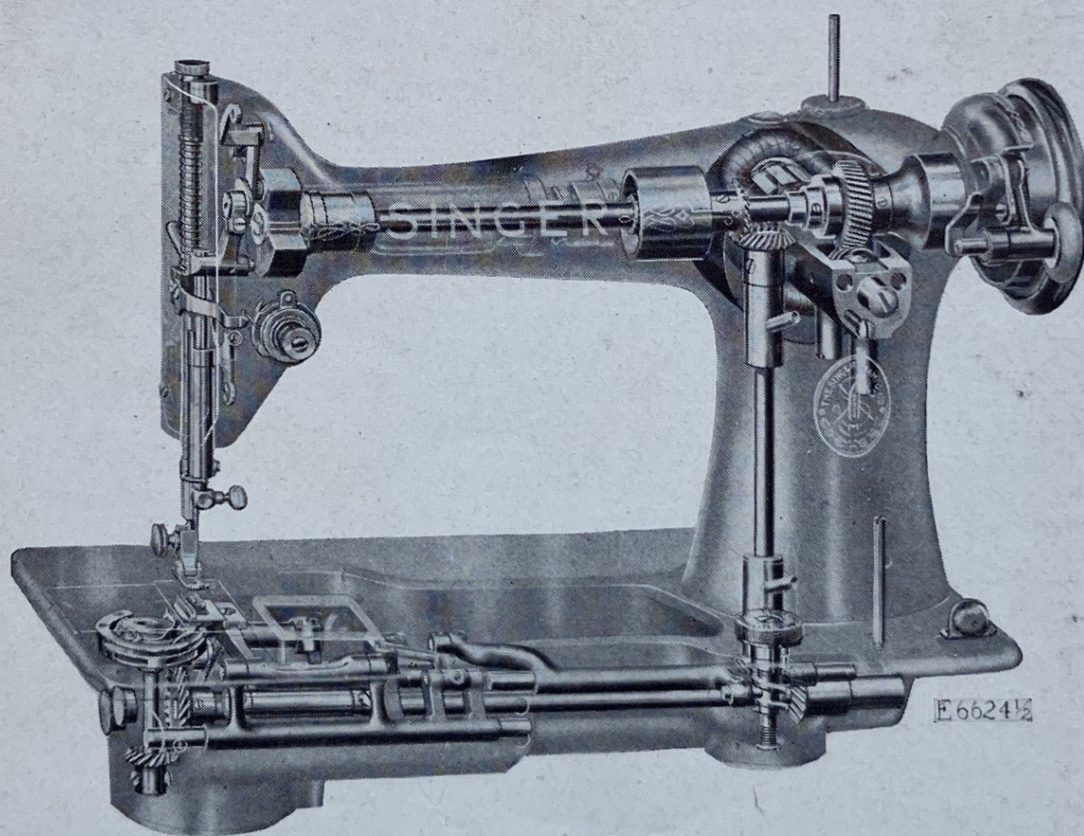
SINGER SEWING MACHINE COMPANY
INCORPORATED
EDUCATIONAL DEPARTMENT
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ADJUSTERS MANUAL FOR MACHINES

101-3 AND 101-11

WITH S. U. AND S. E. MOTORS
AND CARBON CONTROLLERS



Front "X-ray" View of Machine 101-3

SINGER SEWING MACHINE COMPANY
EDUCATIONAL DEPARTMENT

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THE SINGER UNIVERSAL MOTOR

FOR

MACHINES 101-3 AND 101-11

The success attending the introduction of the universal bracket type (BU) motor has indicated the desirability of a similar modification of the motor for Machines of Class 101.

This has now been done and the S. U. motor has been developed, embodying all of the latest features of design so that it will provide even more satisfactory operation than has been experienced with the S. E. motor.

There are thousands of these S. E. motors giving satisfaction in the homes of customers, and the Salesman in describing the superior merits of the S. U. motor, must not speak disparagingly of the S. E. motor.

The S. U. (Singer Universal) motor will operate the sewing machine at speeds approximately 100 stitches per minute faster than the S. E. motor on either direct or alternating current and it will be found that the life of the brushes has been increased several times.

It will no longer be necessary to make any change in the motor for operation on either direct current or any frequency of alternating current from 25 cycles up to 75 cycles.

For frequencies above 75 cycles a special winding will be furnished.

It will, of course, be necessary as before to select a motor having a voltage range corresponding to the voltage of the lighting circuit which is to supply the motor, and the instructions on page 6 covering this point should be carefully followed.

With the exception of the omission of the D. C.—A. C. switch and the increase in size of the brushes, the **general** structure of the S. U. motor will be found to be the same as that of the S. E. motor, and the instructions for the care and handling of the motor and the location of any trouble will be equally applicable to both.

The S. U. motors are as follows:

S. U. MOTORS

Volts	Current	Mach. 101-11 on Portable Elec. Set 204 (Short Motor Leads)	Mach. 101-3 on Elec. Cabt. Table 40 & Elec. Flat Top Cabt. Table 305 (Long Motor Leads)	Mach. 101-3 on Elec. Cabt. Table 40 & Elec. Flat Top Cabt. Table 306 3 Pin Term.	Mach. 101-11 on Portable Elec. Set 204 3 Pin Term.
		Motor Catalog No.	Motor Catalog No.	Motor Catalog No.	Motor Catalog No.
32	Direct Current Only	S. U. 603-A	S. U. 603-B	S. U. 603-C	S. U. 603-E
50	Direct Current and 25 to 75 Cycle Alternating Current	S. U. 605-A	S. U. 605-B	S. U. 605-C	S. U. 605-E
95-100		S. U. 606-A	S. U. 606-B	S. U. 606-C	S. U. 606-E
100-110		S. U. 607-A	S. U. 607-B	S. U. 607-C	S. U. 607-E
115-125		S. U. 608-A	S. U. 608-B	S. U. 608-C	S. U. 608-E
150-165		S. U. 609-A	S. U. 609-B	S. U. 609-C	S. U. 609-E
200-220		S. U. 610-A	S. U. 610-B	S. U. 610-C	S. U. 610-E
210-230		S. U. 611-A	S. U. 611-B	S. U. 611-C	S. U. 611-E
230-250		S. U. 612-A	S. U. 612-B	S. U. 612-C	S. U. 612-E
130-145		S. U. 615-A	S. U. 615-B	S. U. 615-C	S. U. 615-E
100-110	80 to 100 Cycle Alternating Current	S. U. 687-A	S. U. 687-B	S. U. 687-C	S. U. 687-E
200-220		S. U. 690-A	S. U. 690-B	S. U. 690-C	S. U. 690-E
230-250		S. U. 692-A	S. U. 692-B	S. U. 692-C	S. U. 692-E

The Voltage Range of Carbon Controllers can be Determined by the Color of the Porcelain Body as follows:

Low Voltage 32-55 Green—Part No. 192211
 Medium Voltage 95-145 White—Part No. 192140
 High Voltage 150-250 Blue—Part No. 192141

The S. E. motors are as follows:

S. E. MOTORS

Volts	Current	Machine 101-11 on Portable Electric Set 204 (Short Motor Leads)	Machine 101-3 on Elec. Cabinet Table 40 and Elec. Flat Top Cabinet Table 305 (Long Motor Leads)
		Motor Catalog No.	Motor Catalog No.
32	Direct Current Only	S. E. 613-A	S. E. 613-B
100-110	Direct Current and 60 Cycle Alternating Current	S. E. 607-A	S. E. 607-B
115-125		S. E. 608-A	S. E. 608-B
200-220		S. E. 610-A	S. E. 610-B
230-250		S. E. 612-A	S. E. 612-B

S. E. MOTORS—Continued

		Machine 101-11 on Portable Electric Set 204 (Short Motor Leads)	Machine 101-3 on Elec. Cabinet Table 40 and Elec. Flat Top Cabinet Table 305 (Long Motor Leads)
Volts	Current	Motor Catalog No.	Motor Catalog No.
50	Direct Current and 50 Cycle Alternating Current	S. E. 624-A	S. E. 624-B
100-110		S. E. 617-A	S. E. 617-B
115-125		S. E. 618-A	S. E. 618-B
150-165		S. E. 619-A	S. E. 619-B
200-220		S. E. 620-A	S. E. 620-B
210-230		S. E. 621-A	S. E. 621-B
230-250		S. E. 622-A	S. E. 622-B
100-110	25 and 33 $\frac{1}{3}$ Cycle Alternating Current	S. E. 627-A	S. E. 627-B
115-125		S. E. 628-A	S. E. 628-B
150-165		S. E. 629-A	S. E. 629-B
200-220		S. E. 630-A	S. E. 630-B
230-250		S. E. 632-A	S. E. 632-B
100-110	40 and 60 Cycle Alternating Current	S. E. 647-A	S. E. 647-B
115-125		S. E. 648-A	S. E. 648-B
150-165		S. E. 649-A	S. E. 649-B
200-220		S. E. 650-A	S. E. 650-B
230-250		S. E. 652-A	S. E. 652-B
100-110	Direct Current and 40 Cycle Alternating Current	S. E. 657-A	S. E. 657-B
115-125		S. E. 658-A	S. E. 658-B
150-165		S. E. 659-A	S. E. 659-B
200-220		S. E. 660-A	S. E. 660-B
230-250		S. E. 662-A	S. E. 662-B
100-110	67 to 83 Cycle Alternating Current*	S. E. 677-A	S. E. 677-B
115-125		S. E. 678-A	S. E. 678-B
150-165		S. E. 679-A	S. E. 679-B
200-220		S. E. 680-A	S. E. 680-B
230-250		S. E. 682-A	S. E. 682-B
100-110	85 to 100 Cycle Alternating Current*	S. E. 687-A	S. E. 687-B
115-125		S. E. 688-A	S. E. 688-B
150-165		S. E. 689-A	S. E. 689-B
200-220		S. E. 690-A	S. E. 690-B
230-250		S. E. 692-A	S. E. 692-B

*For any intermediate numbers of cycles, insert terminal screw in hole nearest to number of cycles on which the motor is to operate.

NOTE: S. U. and S. E. motors for Machine 101-11 on Portable Set 204 have short motor leads and are designated by the letter A.

S. U. and S. E. motors for Machine 101-3 on Cabinets 40 and 305 have long motor leads and are designated by the letter B.

Points to Determine Before Connecting Motor to Electric Service Line

Obtain the following information from the Electric Light Company which supplies the electric current for the circuit to which the motor is to be connected:

1. Whether alternating current or direct current is used.
2. What is the voltage? The voltage stamped on the motor name plate (B, Figs. 2 and 3) must correspond to that of the circuit to which the motor is to be connected.
3. If the circuit is alternating current, what is the number of cycles? The number of cycles stamped on the motor name plate must correspond to that of the circuit to which the motor is to be connected.
4. The current and voltage of any circuit and, if alternating current, the number of cycles, can be verified by looking at the name plate on electric meter installed by the local Electric Light Company.

To Ensure Correct Demonstration of Machine

1. Never demonstrate the machine on a direct current circuit with the S. E. motor adjusted for alternating current, as this will give an excessively high speed, and would also be misleading to the customer.
2. For most efficient sewing speed, the voltage of the electric service line must be within the range stamped on the motor name plate. A higher voltage will produce an excessive speed and will be injurious to motor, while a lower voltage will cause motor to operate at too slow a speed.
3. The sewing machine should be demonstrated on the same current, and as near as possible at the same voltage, as will be used by the customer.

To Remove the Motor Cover

Turn the motor cover (C, Fig. 2) over toward the balance wheel and pull it outwardly to remove it, thus exposing the motor name plate (B, Fig. 2).

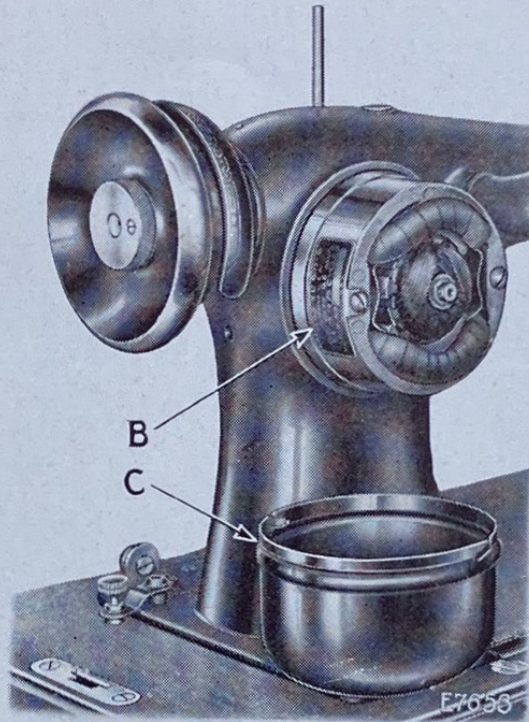


FIG. 2. MOTOR COVER REMOVED
SHOWING NAME PLATE OF S. U. MOTOR

When replacing the motor cover (C), have the two notches in the cover engage the pins at the top and bottom of the motor frame.

Genuine Singer 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

To Adjust the S. E. Motor for Alternating Current or Direct Current

Remove the motor cover (C, Fig. 2) as instructed on the preceding page.

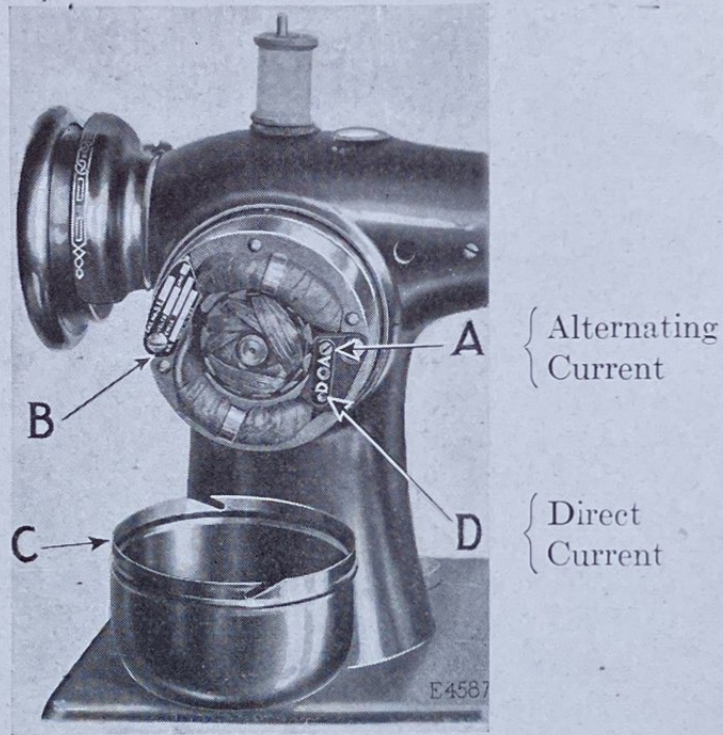


FIG. 3. ADJUSTMENT OF S. E. MOTOR

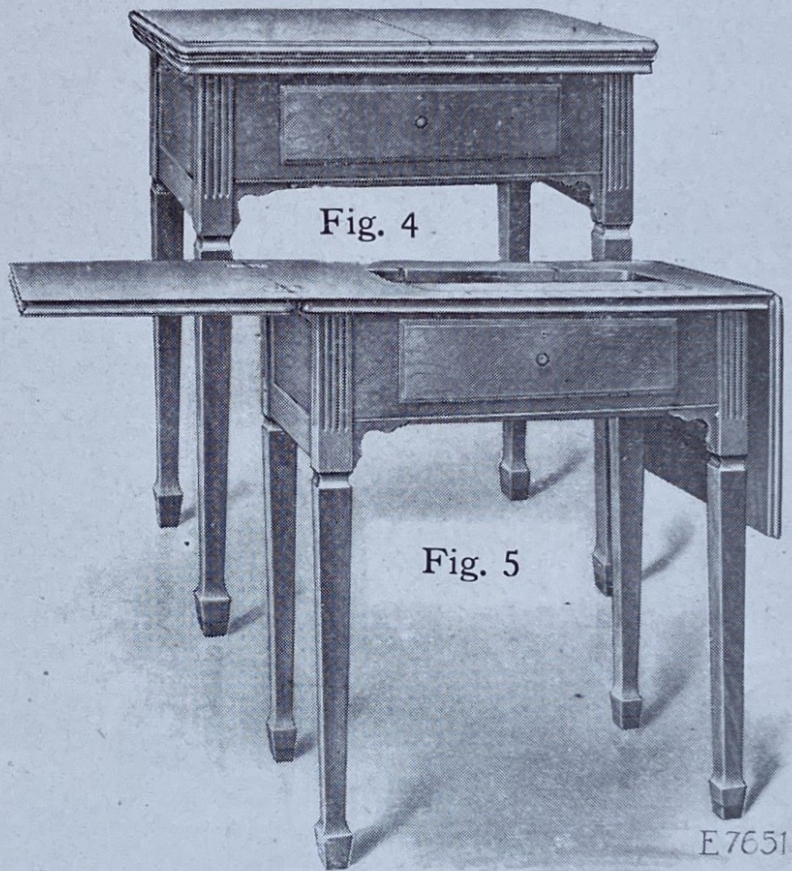
If the motor is to be operated on alternating current, the round-head brass screw in the terminal plate should be inserted in the top hole marked "A" in Fig. 3, and firmly tightened.

If the motor is to be used on direct current, the round-head brass screw should be inserted in the bottom hole marked "D" in Fig. 3, and firmly tightened.

When the screw has been tightened in the correct hole, replace the motor cover (C) as instructed on the preceding page.

To Install Machine 101-3 on Cabinet 40

Raise the two leaves at the top of the table and the supporting rod will automatically spring out at the left of the table. Allow



FIGS. 4 AND 5. TO OPEN CABINET 40

the left leaf to rest on the supporting rod and the right leaf to hang loosely at the right of the table, as shown in Fig. 5.

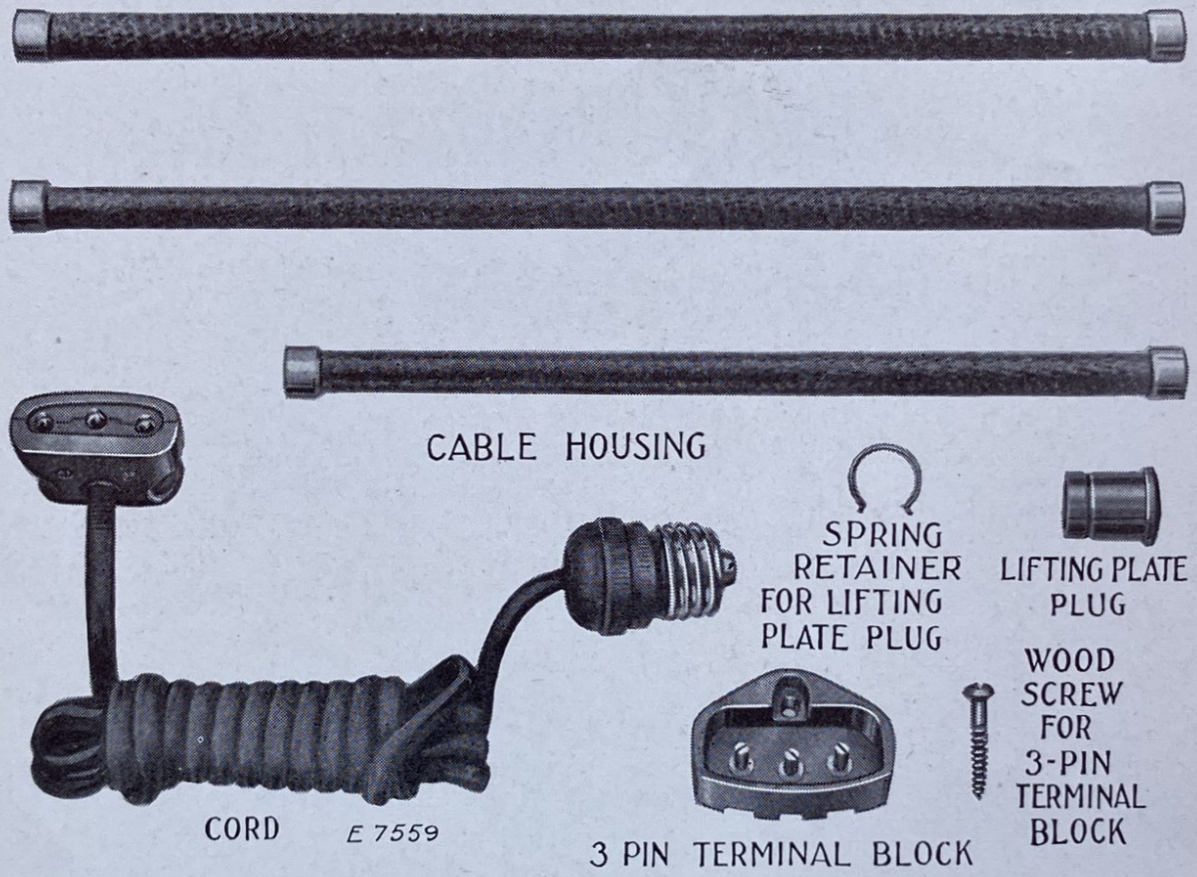


FIG. 6. EQUIPMENT FOR MACHINE 101-3 ON CABINETS 40 AND 306

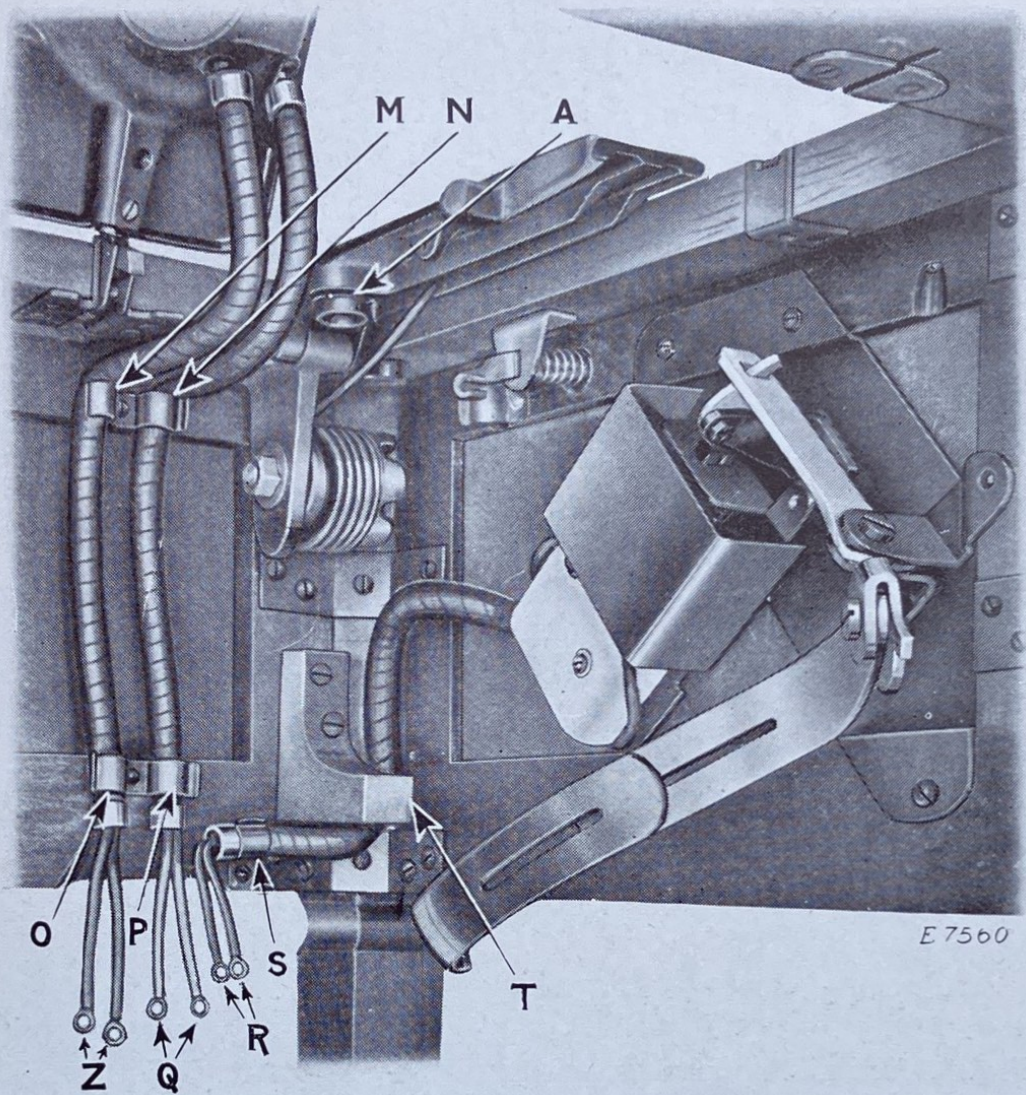


FIG. 7. ARRANGEMENT OF WIRING OF MACHINE 101-3
ON CABINETS 40 AND 306

Place the lifting plate plug (see Fig. 6) in position in the lifting plate at (A, Fig. 7) and snap the spring retainer (see Fig. 6) in place in the groove in the plug on the underside of the lifting plate to hold the plug in position.

Place the machine in position on the two machine hinges in the cabinet and securely tighten the two set screws against the hinges.

Pass the controller leads (R, Fig. 7) with the two eyelets through the short piece of cable housing (see Fig. 6), then pass the housing under the stop block (T, Fig. 7) and snap the end of the housing into the clip (S, Fig. 7).

Pass the two motor leads (Q, Fig. 7) through one of the long pieces of cable housing (see Fig. 6) and snap the housing into the clips (N and P, Fig. 7).

Pass the Singerlight leads (Z, Fig. 7) through the other long piece of cable housing (see Fig. 6) and snap this housing into the clips (M and O, Fig. 7).

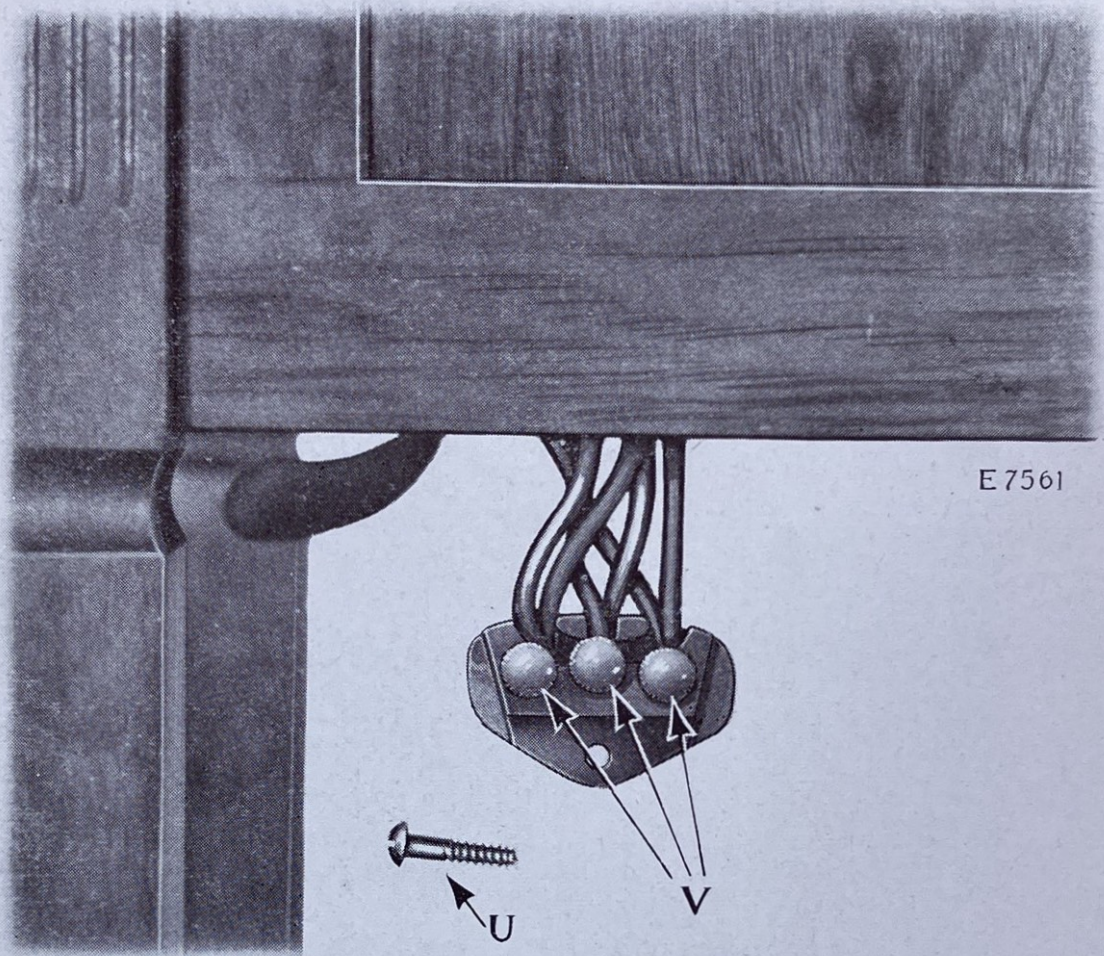


FIG. 8. WIRING OF THREE-PIN TERMINAL BLOCK FOR MACHINE 101-3
ON CABINETS 40 AND 306

Remove the three insulated thumb nuts (V, Fig. 8) and the three brass washers underneath them.

Place the eyelets at the ends of the black leads on the centre post (2) of the three-pin terminal block; place the eyelets at the ends of the red leads on the post nearest the red spot (3), and place the eyelets at the ends of the yellow leads on the post nearest the yellow spot (1). See Fig. 10, page 14, for wiring diagram.

Replace the three brass washers and the three insulated thumb nuts (V, Fig. 8). Fasten the three-pin terminal block (W, Fig. 9) to underside of cabinet with screw (U, Fig. 8) as shown in Fig. 9.

Gently press the loops of leads up and back against the inside of the cabinet so that the shield will not damage the leads.

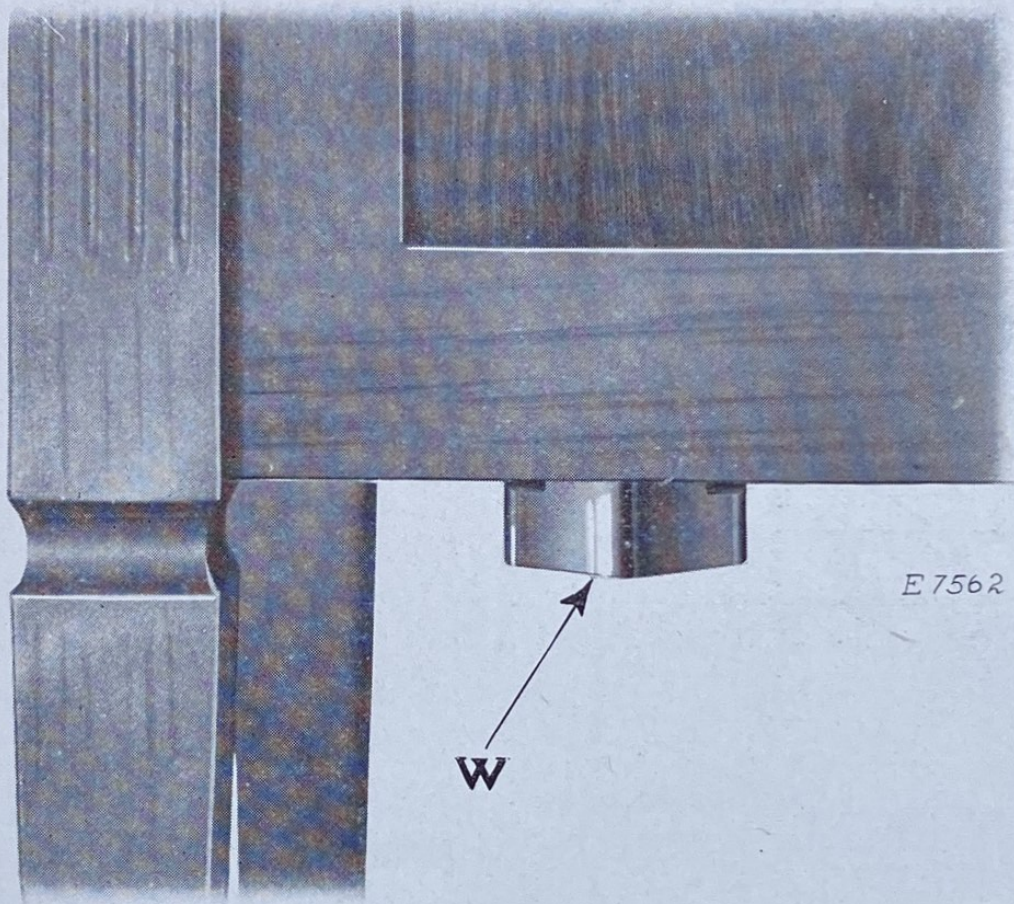


FIG. 9. THREE-PIN TERMINAL BLOCK IN POSITION
ON CABINETS 40 AND 306

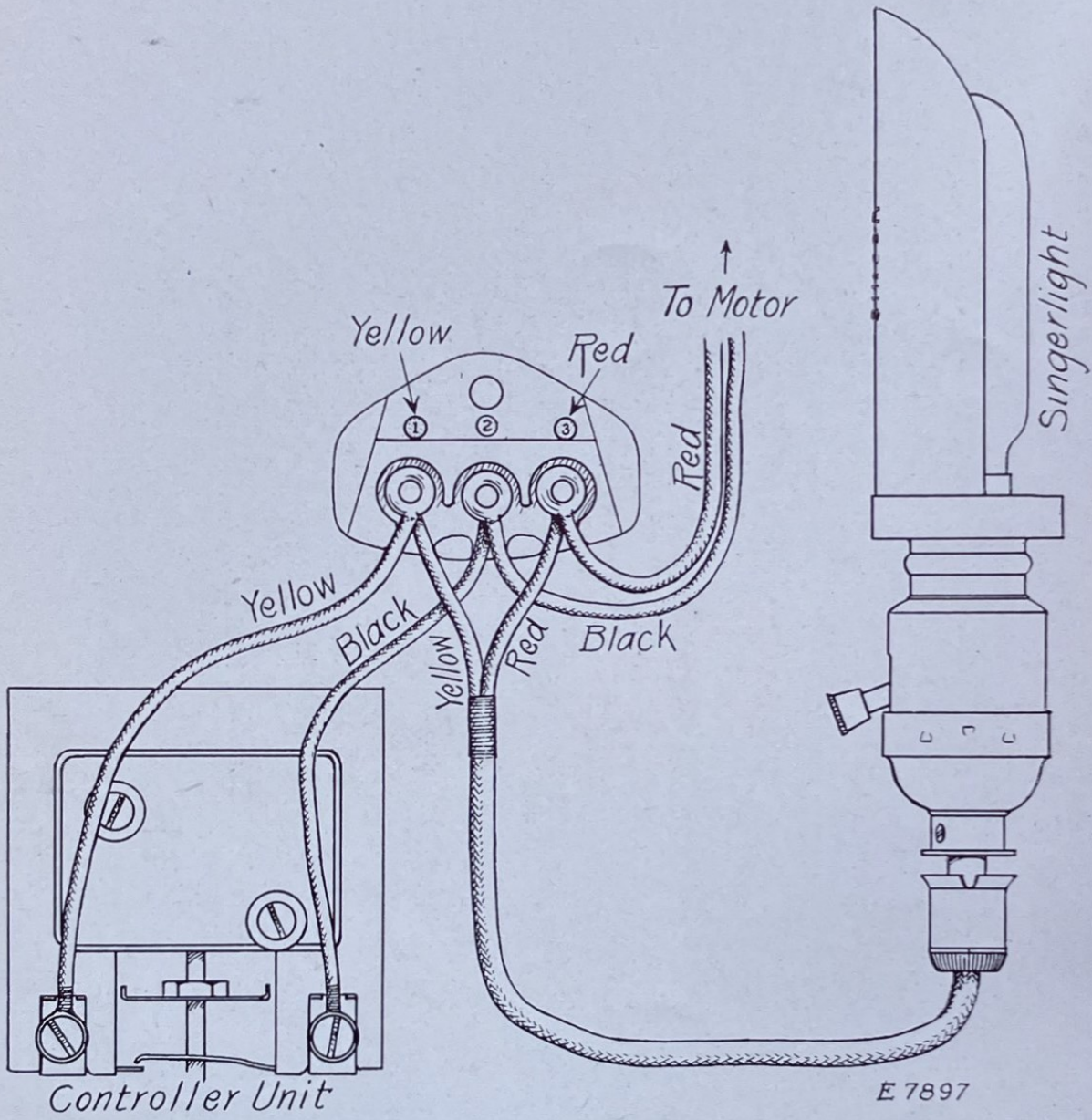


FIG. 10. WIRING DIAGRAM OF MACHINE 101-3
ON CABINETS 40 AND 306

To Connect Machine 101-3 on Cabinets 40 and 306 to Electric Service Line

Push the terminal plug (P, Fig. 11) at the end of the electric cord firmly over the three-pin terminal block (W, Fig. 9).

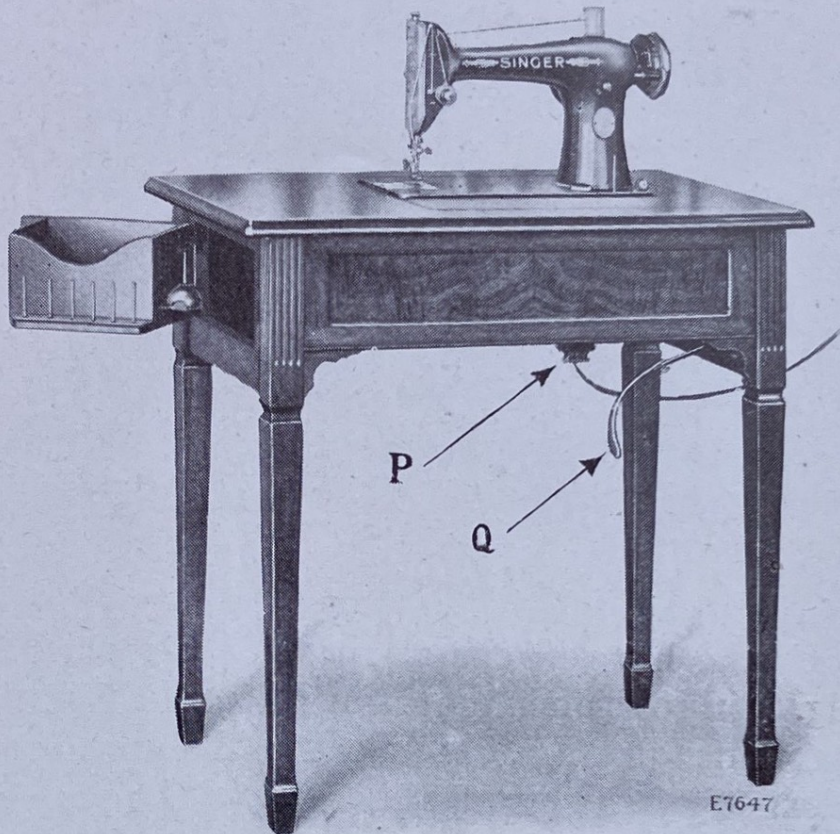


FIG. 11. ELECTRICAL CONNECTION OF CABINETS 40 AND 306
ALSO KNEE LEVER LOWERED INTO OPERATING POSITION

Attach the plug at the other end of the cord to the nearest electric socket, bring the knee lever (Q, Fig. 11) down into position, turn on the switch and the machine is ready for operation.

Note the swing-out drawer on Cabinet 306, in Fig. 11, with holders for spools, bobbins and oil can.

To Adjust the Knee Lever on Cabinets 40 and 306

The length of the knee lever can be varied to suit the operator. The knee lever has an extension which is held in place by a screw and when this screw is loosened, the extension is readily adjusted for the length desired.

After an adjustment is made, the knee lever extension screw should be firmly tightened by means of a screwdriver, the head of the screw having a slot provided for that purpose.

To Install Machine 101-3 on Cabinet 306

With the right hand push in the lever (L, Fig. 12) at the right of the table and at the same time with the left hand raise the hinged flaps of the table top as shown at M in Fig. 12.

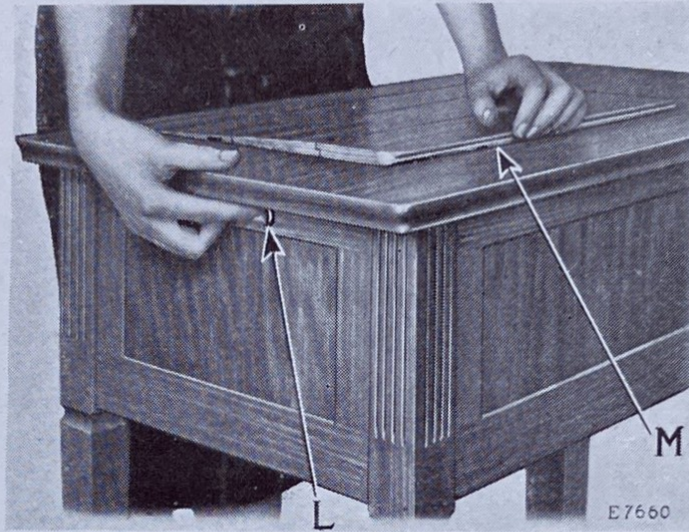


FIG. 12. TO OPEN CABINET 306

Fold back the hinged flaps as shown, place the lifting plate plug (see Fig. 6) in position in the lifting plate at A, Fig. 13, and snap the spring retainer (see Fig. 6) in place in the groove in the plug on the underside of the lifting plate to hold the plug in position.

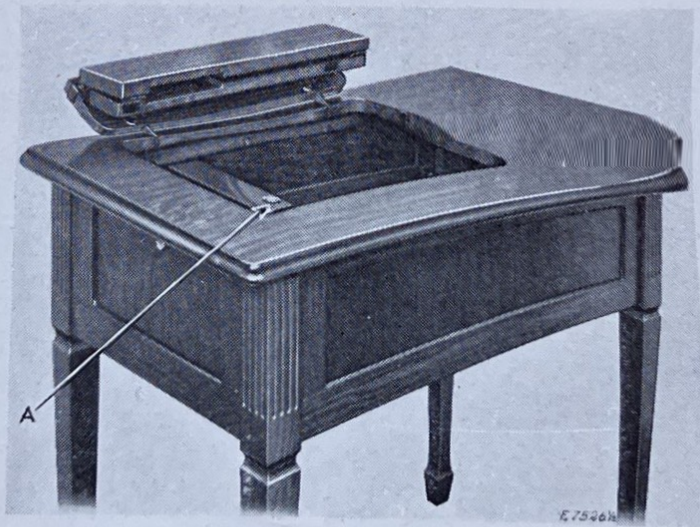


FIG. 13. PREPARING FOR INSTALLATION

Place the machine in position on the two machine hinges in the table and securely tighten the two set screws against the hinges.

To make the electrical connections, follow the instructions given for Cabinet 40 on pages 10 to 15, inclusive.

CAUTION

When raising the sewing machine head out of the cabinet, **always place the left hand under the front side of the arm**

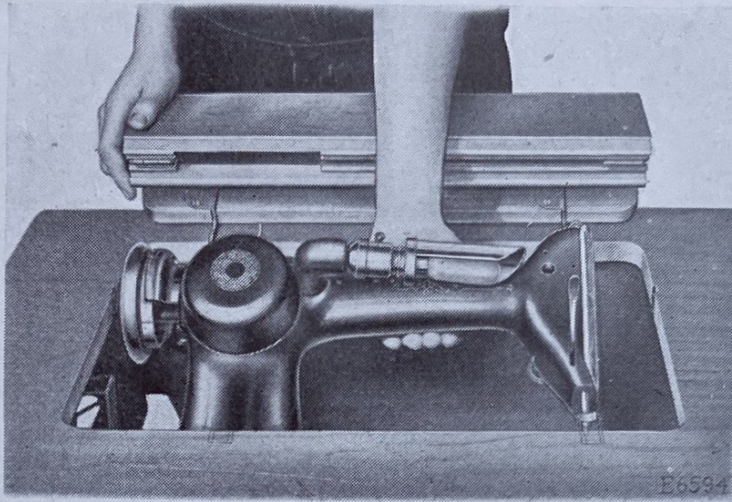


FIG. 14. RAISING MACHINE OUT OF TABLE

of the machine, as shown in Fig. 14, being very careful not to touch the electric lamp or shade, then replace the hinged portion of the table top and lower the machine so that it rests on the table, as shown in Fig. 11, page 15.

To Install Machine 101-11 on Portable Set 204

Remove the screw (AA, Fig. 15) and the three-pin terminal block (BB, Fig. 15), pushing the block outwardly from the inside of the cabinet.

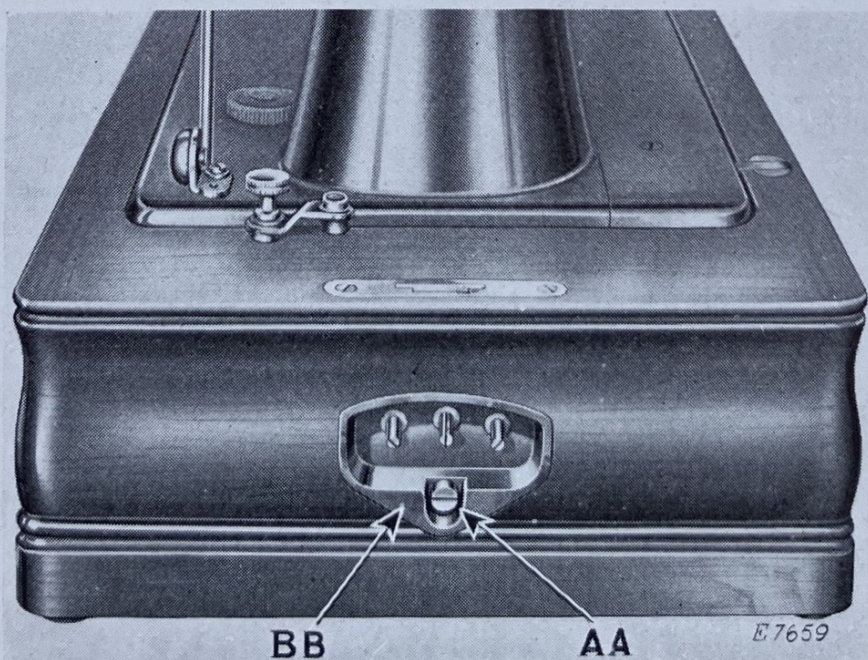


FIG. 15. TO DETACH THREE-PIN TERMINAL BLOCK

Place the machine in position on the two machine hinges in the cabinet, then securely tighten the two set screws against the hinges.

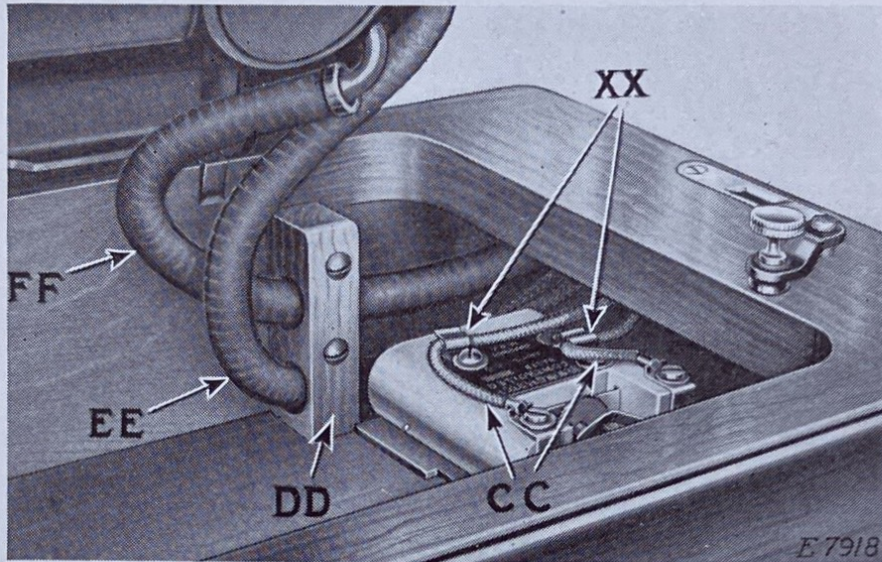


FIG. 16. ELECTRICAL CONNECTIONS OF PORTABLE SET 204

Pass the flexible conduit (FF, Fig. 16) with the two Singerlight leads, through the upper hole in the wooden support (DD, Fig. 16) and back of the controller. Pass the flexible conduit (EE, Fig. 16) with the two motor leads, through the lower hole in the wooden support (DD) and back of the controller. Place the two controller leads (CC, Fig. 16) in the two cleats (XX) as shown in Fig. 16. Then pass the ends of the six leads through the opening which retains the three-pin terminal block in the right end of the cabinet.

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

Remove the three insulated thumb nuts (GG, Fig. 17) and the three brass washers underneath them.

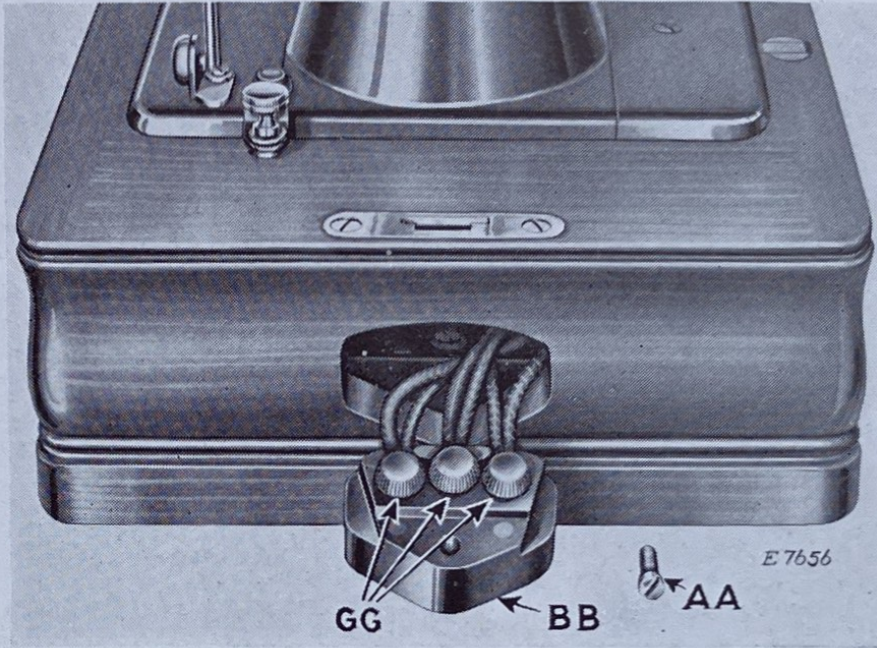


FIG. 17. ELECTRICAL CONNECTIONS OF PORTABLE SET 204

Place the eyelets at the ends of the black leads on the centre post (2) of the three-pin terminal block (BB, Fig. 17); place the eyelets at the ends of the red leads on the post nearest the red spot (3), and place the eyelets at the ends of the yellow leads on the post nearest the yellow spot (1).

See Fig. 10, page 14, for wiring diagram.

Replace the three brass washers and the three insulated thumb nuts (GG, Fig. 17). Fasten the three-pin terminal block (BB, Fig. 17) in position in the opening in the right end of the cabinet with the screw (AA, Fig. 17), as shown in Fig. 15.

To Connect Machine 101-11 on Portable Set 204 to Electric Service Line

Push the terminal plug (HH, Fig. 18) at one end of the electric cord firmly over the three-pin terminal block (BB, Fig. 15).

Attach the plug at the other end of the cord to the nearest electric socket.

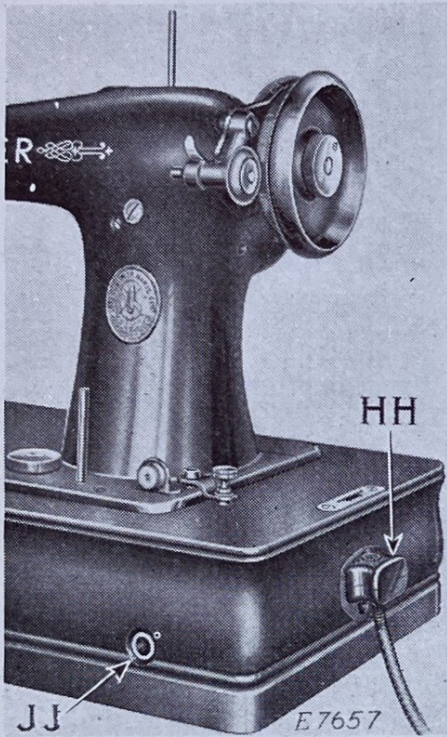


FIG. 18. ELECTRICAL CONNECTION
OF PORTABLE SET 204

To Place the Knee Lever into Operating Position on Portable Set 204

Hold the knee lever in a horizontal position with the handle toward the left and push the end of the lever into the socket (JJ, Fig. 18), then lower the handle of the lever and the end of the lever will engage the stop in the lever socket. The machine is then ready for operation.

To Start the Machine

Turn on the electric current and press the knee lever (Q, Fig. 11, page 15) to the right. As the pressure on the knee lever is increased, the speed of the machine is increased, the speed being controlled entirely by the amount of pressure on the knee lever.

Speed

The S. U. motor, at full speed, should drive the sewing machine at a speed of **not less than** 1000 stitches per minute.

The S. E. motor, at full speed, should drive the sewing machine at a speed of **not less than** 900 stitches per minute.

If the sewing machine has not been run for some time, the speed may be lower for the reason that the lubricant on all of the movable parts is heavy and interferes with the free motion of the machine, thereby retarding its speed. Run the machine a few minutes with the presser foot raised, and without being threaded, and the machine will quickly attain its full speed, provided no other trouble exists.

If, after running the machine a few minutes, the speed is still below that mentioned above, it may be due to any one of the following reasons:

Speed of Machine Too Slow

Caused by Motor Troubles

1. See if the round-head brass screw is in the correct hole in the terminal plate at the back of the S. E. motor. Operating the S. E. motor on alternating current with the screw in the hole marked "D" will cause the motor to run slow.

2. See that the round-head brass screw on the S. E. motor is firmly fastened in position (either at D or A). If this screw is loose, the S. E. motor will run slow. Be sure that the thread of the screw is not stripped, as this will make it impossible to tighten the screw firmly. In this case put in a new screw.

3. Ascertain if the voltage of the circuit is within the range stamped on the motor name plate. If the S. U. or S. E. motor is run on a lower voltage than that stamped on the name plate, the speed of the motor will be too slow.

4. When the S. U. or S. E. motor is used on alternating current, see if the number of cycles of the circuit is within the range stamped on the motor name plate. A 50 cycle S. E. motor will run slow on a 60 cycle circuit.

5. See that the terminal plugs (P, Fig. 11 and HH, Fig. 18) fit tightly on the three-pin terminal block. If the plugs fit loosely, slightly spread apart the two prongs of each pin in the terminal block so as to make them fit tightly in the plugs.

6. See that there is no carbon or grease on the commutator of the motor or that the commutator is not rough, causing the motor to run slow. (Instructions for disassembling the motor are given on pages 24, 25 and 26). The carbon can be easily removed with a rubber eraser.

Caused by Machine Troubles

1. Too much pressure on the presser foot will retard the speed of the machine. The pressure on the presser foot should be adjusted to be as light as possible without interfering with the feeding of the material.

2. Binding gears may cause the motor to run slow. Loosen the screw (K3, Fig. 34, page 39) at the front of the upright part of the arm which holds the motor frame in the machine. With the knee lever held at full-speed position, turn the motor frame slightly in each direction and note whether there is any increase in speed. If there is, turn the motor frame to the point where the speed is highest, then firmly tighten the screw (K3).

NOTE: If none of these remedies prove to be effective, secure authority from Central Agency to return the machine to the factory.

Speed of Machine Too Fast

This may be due to the following:

1. See if the round-head brass screw on the S. E. motor is in the correct hole in the terminal plate at the back of the motor. Operating the S. E. motor on direct current with the screw in the hole marked "A" will cause the motor to run too fast.

2. Ascertain if the voltage of the circuit is within the range stamped on the motor name plate. If the S. U. or S. E. motor is run on a higher voltage than that stamped on the name plate, the speed of the machine will be too fast.

3. When the S. U. or S. E. motor is used on alternating current, see if the number of cycles of the circuit is within the range stamped on the motor name plate. A 60 cycle S. E. motor will run too fast on a 50 cycle circuit.

Motor Fails to Run

This may be due to any one of the following reasons:

1. Loose or broken connections.

2. Observe carefully all plugs and connections and make sure that there are no broken wires and that all screwed connections are tight.

3. Electric current not turned on.

4. See that the voltage and number of cycles of the electric service line are within the range stamped on the motor name plate.

5. Round-head brass screw of S. E. motor in terminal plate hole (either A or D) not making good contact. The screw may be loose or the threads on the screw may be stripped.

6. Carbon brushes (W, Figs. 22 and 23, page 25) not making contact due to sticking in brush tubes or on account of grease on the commutator.

7. Turn the balance wheel slowly over toward you by hand to ascertain if there is any excess friction or binding on the machine.

8. Remove the motor from the machine, as instructed on pages 24, 25 and 26, and see if armature turns over freely by running the finger over the spiral pinion (U, Fig. 21, page 25). If the armature turns stiffly, it should be adjusted to turn freely by following the instructions given on page 27.

Motor Fails to Run—Continued

Excessive friction in the motor may be due to any of the following reasons:

1. Spiral pinion (U, Fig. 21, page 25) on motor shaft not properly adjusted.
2. No lubricant in grease cups (Q, Fig. 20, page 24).
3. Lubricating wicks (P, Fig. 20) not touching motor shaft.
4. Brush tubes (V, Figs. 22 and 23, page 25) rubbing on commutator.
5. Armature striking field coils.

Controller Does Not Give Enough Variation of Speed

See that the marking on the name plate of the controller resistance covers the range stamped on the motor name plate (B, Figs. 2 and 3). If it does, try another controller. If the second controller operates satisfactorily, return the first controller to the factory for inspection.

Emergency Adjustment of Carbon Resistance Units for Knee Control

While all dismantled units carried by agencies for replacement purposes are adjusted before leaving the factory, in some cases,

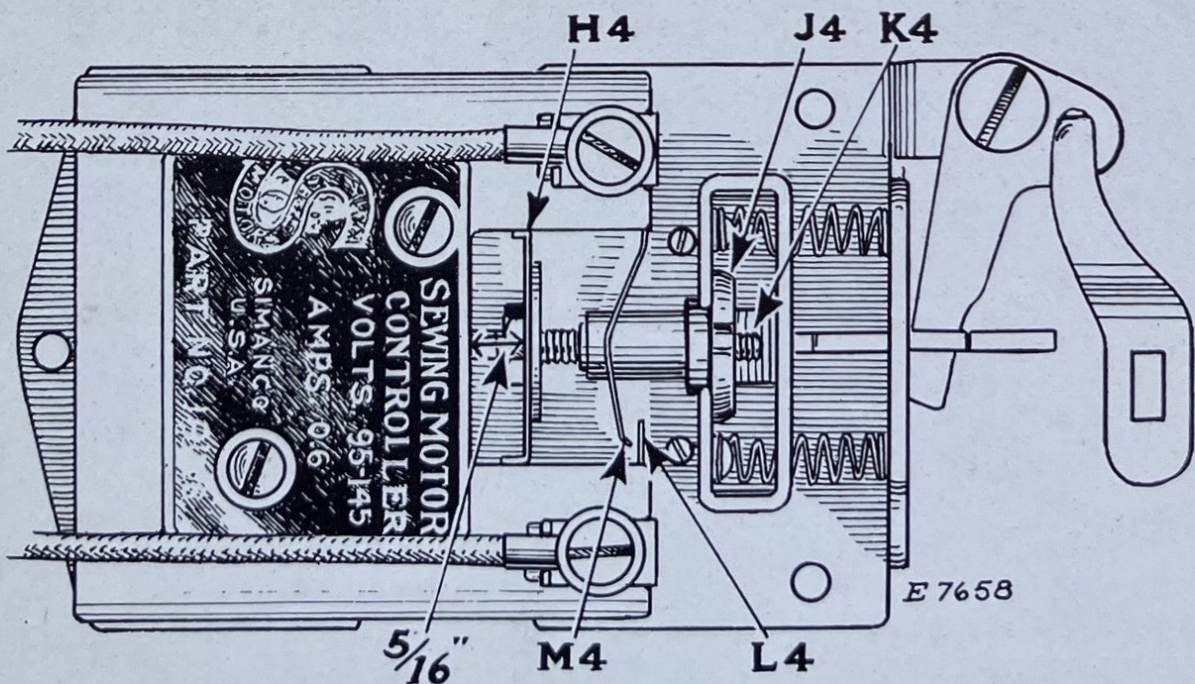


FIG. 19. EMERGENCY ADJUSTMENT OF CARBON KNEE CONTROLLER

however, it may be necessary for the Salesman to adjust the unit after mounting on the knee control mechanism and the following instructions can be used as a guide:

1. With the knee lever in the "Off" position or at the extreme left, adjust the pull rod (K4, Fig. 19) by means of the insulated thumb nut (J4, Fig. 19) until the rear face of the thin metal cross slide (H4, Fig. 19) carried by the pull rod is, $\frac{5}{16}$ " from the flat face of the porcelain as shown in Fig. 19.

2. Move the knee lever to the extreme right or full speed position and make sure that the bronze contact strips (L4 and M4, Fig. 19) of the short circuiting device make positive contact with each other, thus cutting out all resistance.

3. If, with the knee lever at the extreme right, the short circuiting device does not make contact, bend the short bronze strip (L4, Fig. 19) slightly as required, but care should be taken to see that the pressure of the contact is not so great as to noticeably bend the bronze strip (M4, Fig. 19) near the point at which it is secured to the porcelain body. If this occurs, the short bronze strip should be bent slightly away from the long strip so that the short circuiting pressure is positive but not heavy.

To Remove and Disassemble the Motor

Remove the motor cover (C, Fig. 2) from the motor frame, also remove the cloth plate from the machine as instructed on

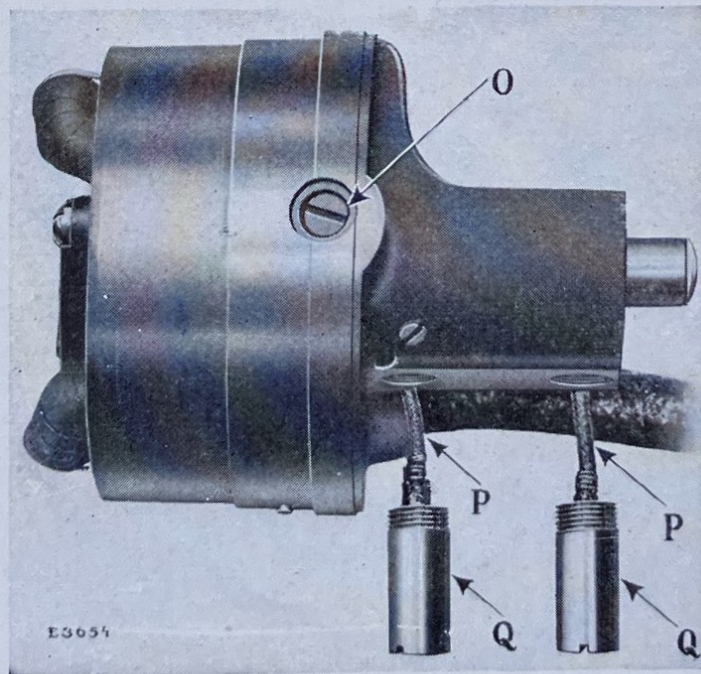


FIG. 20. VIEW OF MOTOR, SHOWING GREASE CUPS REMOVED

page 32. Turn the machine back on its hinges and disconnect the two motor wires from the terminal posts.

Take out the screw (K3, Fig. 34, page 39) which holds the motor frame in the machine, and the large screw near it which

To Remove and Disassemble the Motor—*Continued*

covers the end of the motor armature, then turn the motor frame slightly from side to side and at the same time pull it outwardly

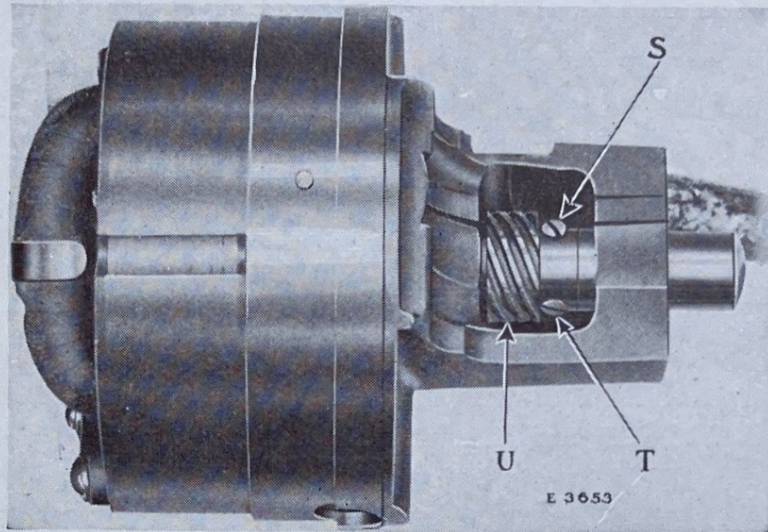
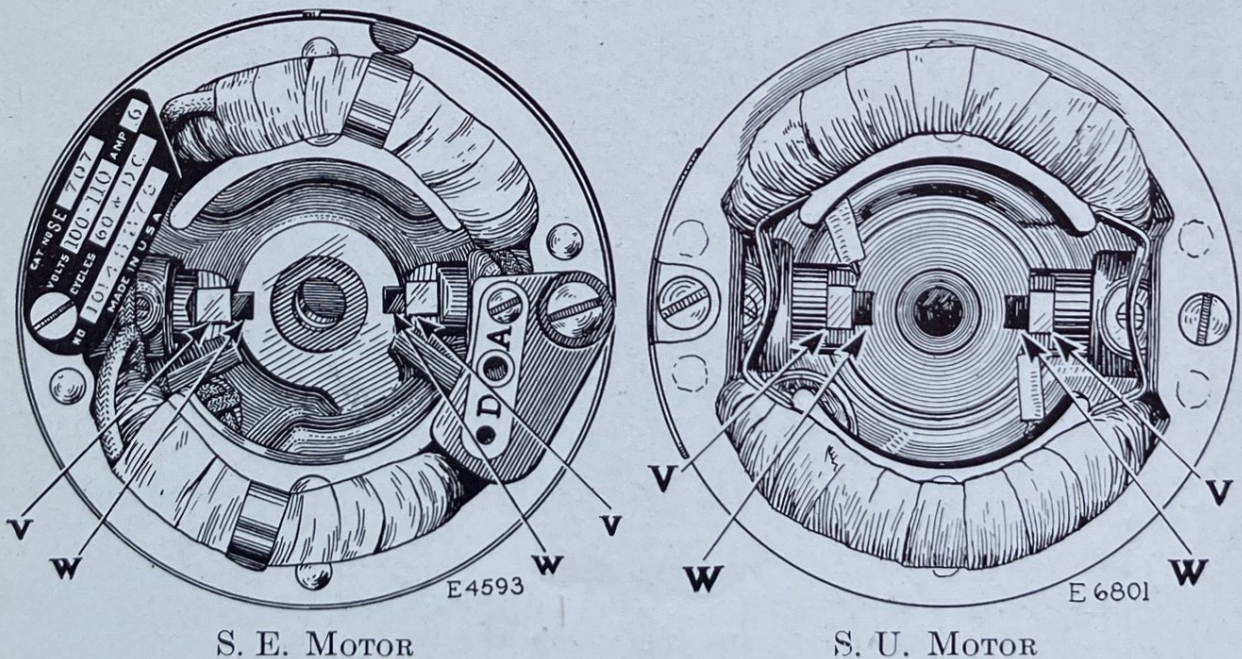


FIG. 21. VIEW OF MOTOR, SHOWING SPIRAL DRIVING PINION

to remove it from the machine, drawing the insulating cable and two wires up through the hole in the bed.

Remove the two grease cups (Q, Fig. 20, page 24) to prevent the wicks (P, Fig. 20) being sheared off when replacing the armature in the motor frame.



FIGS. 22 AND 23. INTERNAL VIEW OF MOTORS, SHOWING BRUSHES AT THE SIDES

The motor has two screws (O, Fig. 20) and (A2, Fig. 24, page 26), one being in each side of the motor frame. Take out these two screws, being careful to see that the springs which are under the screws do not fly out, then turn the motor frame so that the springs and brushes will drop out of the screw holes.

To Remove and Disassemble the Motor—*Continued*

Loosen the two set screws (S and T, Fig. 21) in the spiral pinion and withdraw the armature from the motor frame, being careful not to damage the wiring of the armature or the surface of the commutator.

By removing the armature from the motor frame, the spiral pinion (U, Fig. 21) is separated from the armature shaft so that it can be lifted out of the recess between the two motor bearings.

To Reassemble and Replace the Motor

Place the spiral pinion (U, Fig. 21) in the recess between the two bearings in the motor frame, being careful to have the teeth of the spiral pinion toward the armature. Then gently replace the armature in the motor frame, passing the armature shaft through the hole in the spiral pinion (U). Push the armature into the motor frame as far as it will go, then push the spiral pinion against the inner bearing (Z, Fig. 24) in the motor frame, being careful to see that there is no grease or dirt between the pinion and bearing.

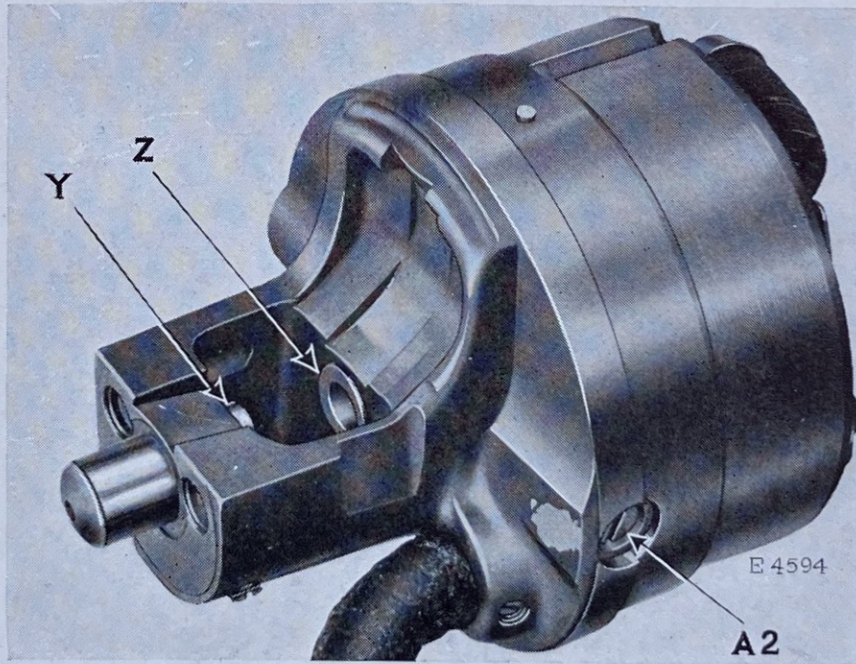


FIG. 24. VIEW OF MOTOR, SHOWING CLEARANCE BETWEEN BEARINGS FOR SPIRAL DRIVING PINION

Fasten the spiral pinion to the armature shaft by means of the two set screws (S and T, Fig. 21) tightening first the set screw which bears against the flat part of the shaft. To determine the flat part of the shaft for the spiral pinion set screw, turn the armature shaft until the small flat mill on its end is in line with the set screw in the spiral pinion, then tighten the set screw.

To Reassemble and Replace the Motor—*Continued*

It will be noticed that there is a bronze painted mark and an aluminum painted mark on the outside of the motor frame casting, and that one of the brushes has a small bronze painted mark on one of its sides, and the other brush an aluminum painted mark. When replacing the brushes, care must be taken to insert the brush which is marked with bronze into the screw hole in the side of the motor marked with bronze, inserting the unmarked end of the brush first with the marked side of the brush facing toward the marking on the motor frame.

The brush marked with aluminum must be inserted in the screw hole in the side of the motor frame marked with aluminum, the unmarked end of the brush being inserted first with the marked side of the brush facing toward the marking on the motor frame. This will ensure a perfect contact of the brushes against the commutator surface of the motor. Having inserted the brushes and springs in the brush tubes (V, Figs. 22 and 23, page 25), replace the screws (O, Fig. 20, page 24) and (A2, Fig. 24, page 26) and turn each screw inwardly until the top of its head is flush with the top edge of the fibre tube.

See if motor armature revolves freely by running the finger over the spiral pinion (U, Fig. 21, page 25). If it turns stiffly, the spiral pinion may be set too tight against the inner bearing (Z, Fig. 24). In this case, insert a piece of heavy wire through the small hole in the centre of the end of the outer bearing (Y, Fig. 24) and gently tap the wire until the armature turns freely without end play. The clearance for the spiral pinion (U) between the two motor bearings (Y and Z, Fig. 24) must be only sufficient to allow the spiral pinion to rotate without friction. Too much clearance will cause the armature to vibrate when running, making the motor noisy. If there is too much clearance, gently tap the end of the outer bearing (Y, Fig. 24) toward the spiral pinion.

Fill the two grease cups (Q, Fig. 20) with Singer Motor Lubricant. See that the two felt wicks (P, Fig. 20) are not twisted or bent, as the ends of the wicks must press positively against the motor shaft to ensure proper lubrication. Replace the grease cups in the motor frame, being careful to insert the wicks into the holes in the motor bearings. Then fill the well in which the spiral pinion (U, Fig. 24) revolves, with Singer Motor Lubricant (**not oil**).

To replace the motor, pass the two wires and insulating cable of the motor down inside of the arm and through the hole in the bed. (A piece of wire with a hook at one end may be inserted from below to draw the wires and cable down through the hole in the bed). While drawing the wires and cable through the hole

To Reassemble and Replace the Motor—*Continued*

in the bed, gently insert the motor into the machine, and turn it slightly from side to side until the spiral pinion meshes with the gear on the arm shaft and the motor will slip into position. Replace the screw (K3, Fig. 34, page 39) which fastens the motor frame in the machine, but do not tighten it. Then connect the two motor wires to the correct terminal posts as instructed on pages 12 and 19.

With the knee lever held at full speed position, turn the motor frame slightly in each direction until the point where the speed is highest is reached, then firmly tighten the screw (K3, Fig. 34), thus fastening the motor frame securely in position. Then replace the motor cover and the screw in the front end of the armature shaft.

Singerlight Fails to Light

This may be due to any one of the following reasons:

1. Electric current not turned on.
2. Singerlight switch not turned on.
3. Loose or broken connections. See that the two insulated thumb nuts which fasten the Singerlight wires to the terminal posts are firmly tightened.
4. The Singerlight bulb may be broken or burnt out.

NOTE: The voltage marked on the Singerlight bulb must be within the range stamped on the name plate of the electric meter installed by the local Electric Light Company.

The standard Singerlight bulb in the United States of America is for 110-120 volts (Part No. 190744).

Bulbs can be furnished for 32 volts (Part No. 191039), 50 volts (Part No. 191165) and other voltages up to 250.

To Remove and Replace the Bulb

To remove the bulb, hold the Singerlight socket (Fig. 25) tightly with one hand and with the other hand turn the shade

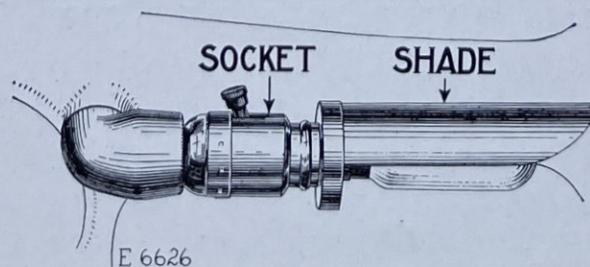


FIG. 25

halfway around until the pin for the shade (Fig. 26) is in the slot of the shade, then gently slip the shade off and allow it to hang free as shown in Fig. 26.

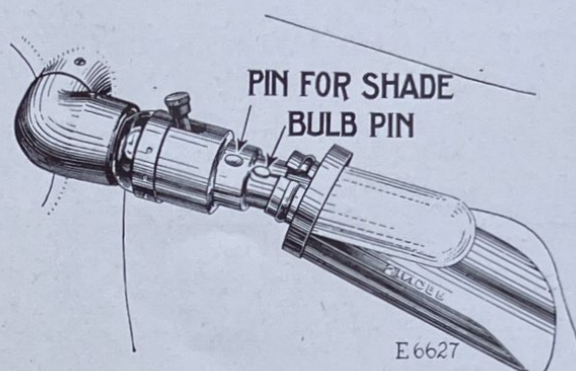


FIG. 26

Do not attempt to unscrew the bulb. It is of the bayonet and socket type and does not unscrew. Press the bulb into the socket and at the same time turn it away from the machine until the bulb pin is out of the notch in the socket, then withdraw the bulb and shade.

To insert a new bulb, pass the bulb through the collar of the shade with the slot of the shade upward. Hold the socket tightly with one hand and at the same time with the other hand press the bulb into the socket with the bulb pin in the slot and turn it towards the machine until this pin is in the notch. Then slip the shade over the socket, having the pin for the shade in the slot of the shade. When the pin is opposite the groove of the shade, turn the shade halfway around or until it is at the top as shown in Fig. 25.

Machine Becomes Noisy

1. If a piece of thread or a particle of lint has become caught in the bobbin case bearing of the hook body, it might cause noise.
2. If the feed dog is improperly located lengthwise in the feed slot of the throat plate, causing it to strike on either end of the slot, particularly when set to the long stitch, it would cause noise.
3. Examine shock-absorbing spring (B4, Fig. 27) to see if it is functioning properly in the clutch mechanism.

Slipping Clutch

To determine whether the clutch is slipping, remove the motor cover and press the knee lever to full speed position. If the armature rotates while the sewing machine remains idle, the clutch is slipping.

This may be due to any one of the following reasons:

1. Worn clutch roller (C2, Fig. 27).

2. Weakened or broken clutch spring (D2, Fig. 27). (The clutch spring should be strong enough to force the clutch roller against the bearing surface of the clutch gear.)

3. Clutch roller and spring clogged with heavy grease or dirt.

Instructions for removing the clutch from the machine are as follows:

To Remove the Clutch from the Machine

Remove the motor from the machine as instructed on pages 24, 25 and 26.

Loosen the screw (N2, Fig. 27) in the stop motion thumb nut (M2, Fig. 27) at the right of the balance wheel and unscrew the

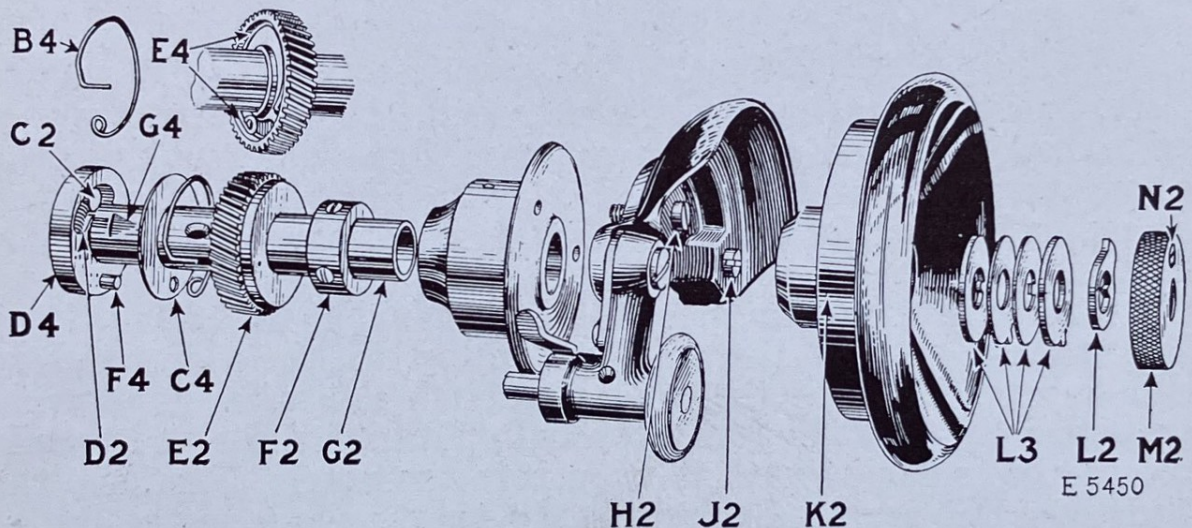


FIG. 27. VIEW OF PARTS REMOVED FROM THE MACHINE
SHOWING CLUTCH ROLLER, CLUTCH SPRING
AND SHOCK ABSORBING SPRING

thumb nut (M2). Then remove the washer (L2, Fig. 27) and the four washers (L3), loosen the two set screws in the hub of the balance wheel and remove the balance wheel. Take out the two screws (H2 and J2, Fig. 27) which fasten the bobbin winder bracket and belt cover to the machine, and slide the bracket off the arm shaft, being careful not to spring the arm shaft. Withdraw the sleeve (G2, Fig. 27), then loosen the two set screws in the smaller collar (F2, Fig. 27) and slide the collar, gear (E2, Fig. 27), shock absorbing spring (B4, Fig. 27) and washer (C4, Fig. 27) off the sleeve (G2, Fig. 27). Remove and thoroughly clean the roller (C2, Fig. 27) and spring (D2, Fig. 27).

To Replace the Clutch Unit

Replace the spring and roller in the recess in the large collar (D4, Fig. 27), being careful to see that the spring bears evenly against the roller. Then pack the recess with Singer Motor Lubricant and place the washer (C4, Fig. 27) next to the large collar.

Enter the tip of the shock absorbing spring (B4, Fig. 27) in the hole in the wall of the gear and place the spring inside the rim of the gear, as shown at (E4, Fig. 27). Then pack the shock-absorbing spring recess with Singer Motor Lubricant. Enter the pin (F4, Fig. 27) into the washer (C4, Fig. 27) and into the eye of the shock-absorbing spring, then snap the parts back against the large collar (D4, Fig. 27).

The spring (B4, Fig. 27) gives a cushion effect as the gear (E2, Fig. 27), driven by the motor pinion, takes up the varying load of the machine. As the gear has a tendency to work toward the smaller collar, the two set screws in this collar must be tight, one of them being positioned on the beveled flat (G4, Fig. 27). **Be careful to see that the gear (E2, Fig. 27) can move freely between the two collars so as not to interfere with the absorbing action of the gear when the vibrations take place.**

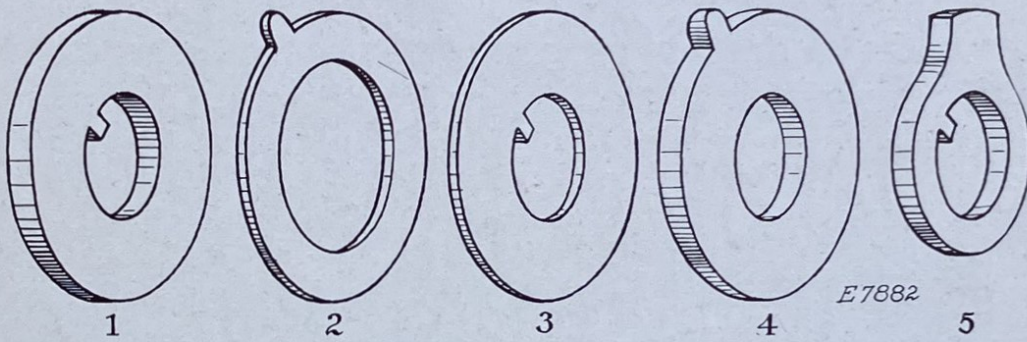


FIG. 27A. REPLACING WASHERS

Replace the bushing (G2, Fig. 27) on the arm shaft. Then replace the bobbin winder bracket and belt cover and firmly fasten it by means of the two screws (H2 and J2, Fig. 27). Replace the balance wheel and slip washers (see Fig. 27A) over the end of the arm shaft in the following order: 1, the thick washer with inside key in keyway of arm shaft; 2, the thin washer with outside key in keyway of balance wheel; 3, the thin washer with inside key in keyway of arm shaft; 4, the thick washer with outside key in keyway of balance wheel; 5, the washer over the end of arm shaft with the key in the keyway of the shaft. Then replace the stop motion thumb nut (M2, Fig. 27) and screw it on the shaft as far as it will go, after which tighten the screw (N2, Fig. 27) in the stop motion thumb nut. See that the screw (N2) does not bear on the projection on the outside of the washer (5), also that there is sufficient clearance between the projection and the screw to release the balance wheel, or to lock it by means of the stop motion thumb nut. If the screw (N2) bears on the projection, or there is not sufficient clearance, loosen the screw (N2), remove the stop motion thumb nut and reverse the position of the washer (5) on the shaft, then replace the stop motion thumb nut and firmly tighten the screw (N2).

The balance wheel should now be fastened in position by means of the two set screws in its hub. See whether bushing runs freely on shaft; if not, the two balance wheel set screws are too tight.

The balance wheel hub should be adjusted as closely as possible to the face of the arm shaft bushing without binding.

Then replace the motor in the machine as instructed on pages 26, 27 and 28.

To Remove the Cloth Plate

Raise the needle to its highest point; also raise the presser foot. Unscrew the bobbin winder spool pin and take out the four screws which hold the cloth plate to the bed of the machine, then raise the cloth plate clear of the stitch regulator and draw it to the left under the presser foot to remove it from the machine.

To Time the Sewing Hook

Remove the cloth plate as instructed above, then remove the presser foot, throat plate, feed dog and face plate. Also take out

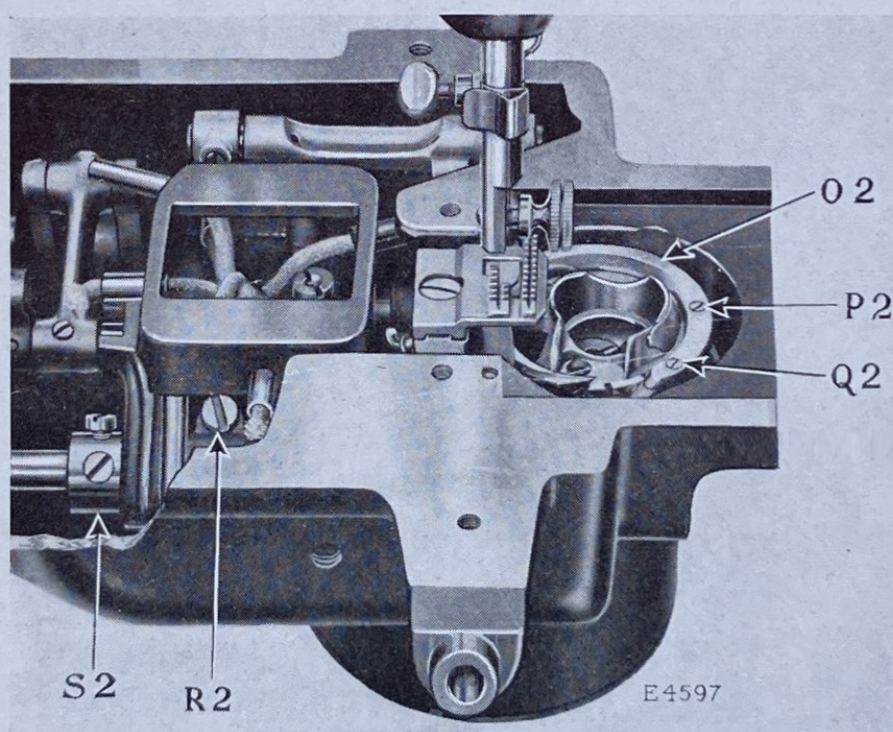


FIG. 28. VIEW OF MACHINE, SHOWING ROTATING HOOK SECTION (O2)
ALSO ADJUSTING SCREW (R2) FOR RAISING AND LOWERING
FEED DOG AND ECCENTRIC (S2) FOR TIMING
FEEDING MECHANISM

the two screws (P2 and Q2, Fig. 28) and remove the rotating hook section (O2, Fig. 28) then lift out the bobbin case. This will give a clear view of the point of the hook and the needle for for the purpose of timing.

To Time the Sewing Hook—*Continued*

Turn the balance wheel over toward you until the needle bar connecting stud (U2, Fig. 29) which has upon it two timing marks,

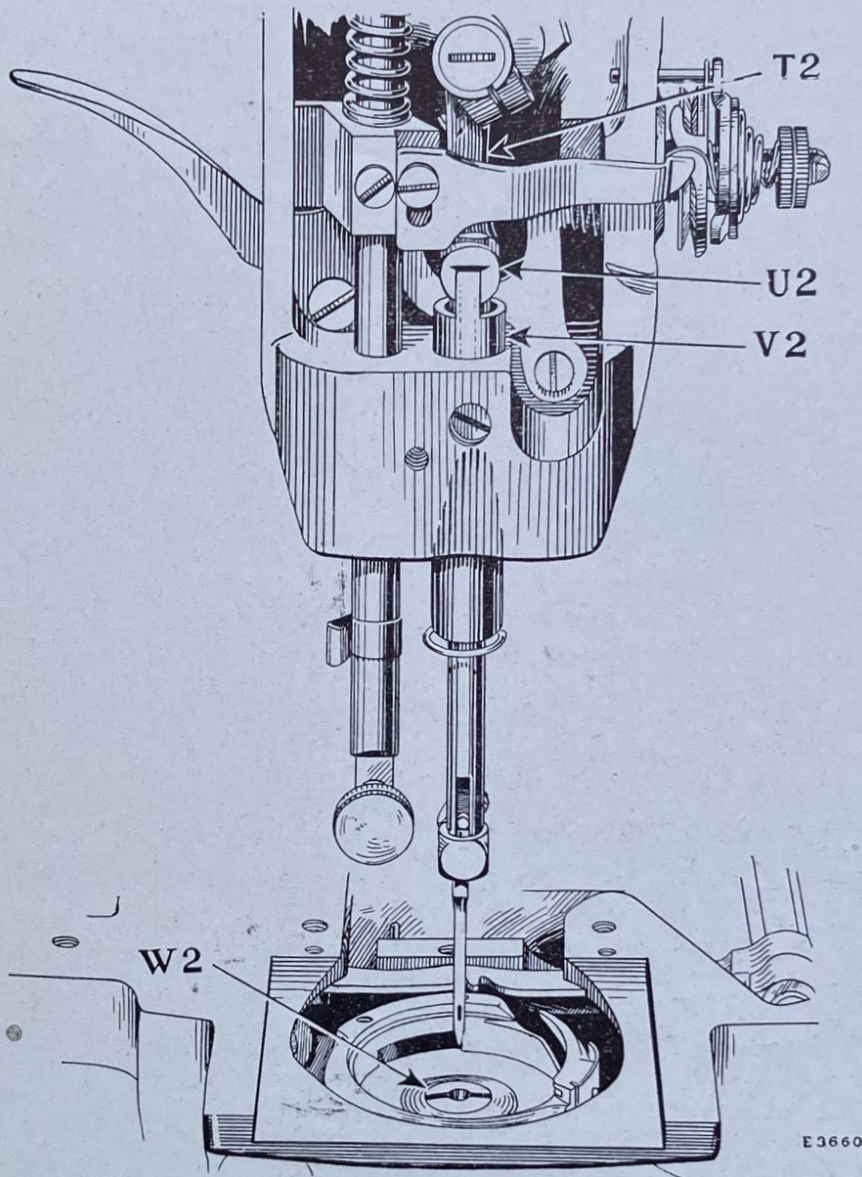


FIG. 29. SHOWING CORRECT ADJUSTMENT OF TIMING GAUGE

moves down to its lowest point. When the stud is in this position, the upper mark should be centred on the top of the finger of the timing gauge (V2, Fig. 29) which is fitted around the needle bar bushing. In some cases it may be necessary to raise or lower the timing gauge to bring the top of its finger on a line with the upper mark on the stud when the stud is at its lowest point, as shown in Fig. 29.

Then turn the balance wheel over toward you until the lower mark on the needle bar connecting stud (U2, Fig. 30) is centred

To Time the Sewing Hook—*Continued*

on the top of the finger of the timing gauge (V2, Fig. 30) when the needle bar is on its upward stroke. When the needle bar is

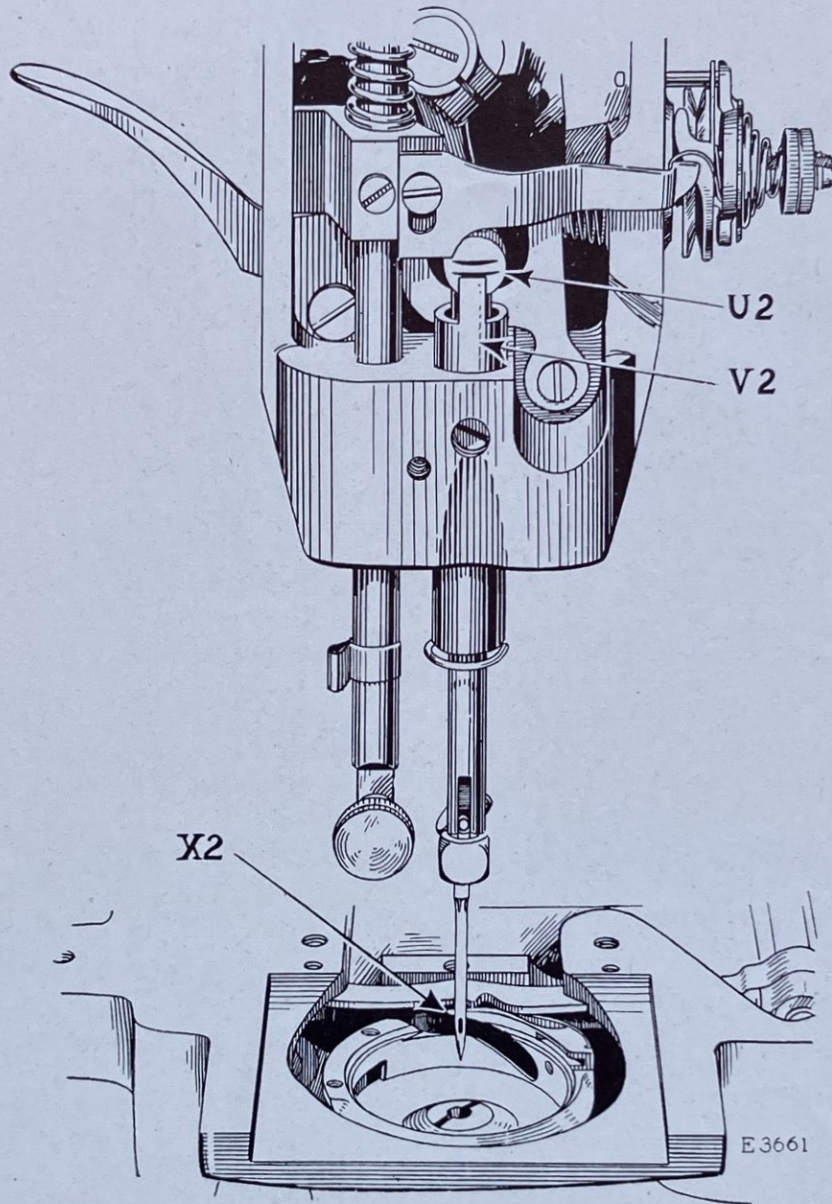


FIG. 30. SHOWING NEEDLE AND HOOK CORRECTLY TIMED

in this position, the point of the hook should be just visible at the left of the needle, as shown at X2 in Fig. 30, if the hook is correctly timed.

In case the hook is not correctly timed, tip the machine back on its hinges and remove the large circular cover plate at the left on the underside of the bed, then loosen the two set screws (Z2 and A3, Fig. 31, page 35) in the large gear (Y2, Fig. 31) at the end of the rotating shaft, and turn the hook until its point is just visible at the left of the needle as shown at X2 in Fig. 30,

To Time the Sewing Hook—*Continued*

then firmly tighten the two set screws (Z2 and A3, Fig. 31) in the large gear, being careful to see that the gear is pushed against the

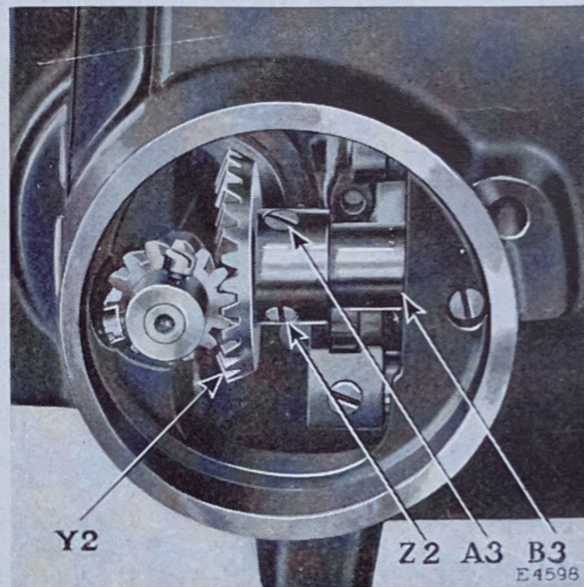


FIG. 31. SHOWING GEAR ADJUSTMENT FOR CHANGING TIME OF HOOK

bushing (B3, Fig. 31) after the end play has been taken up in the rotating shaft. This will ensure quiet running gears. Access to the rotating shaft, for taking up the end play, is obtained by removing the small circular cover plate at the right on the underside of the bed, so that the shaft can be moved to the left by hand. When the hook has been correctly timed, replace the two circular cover plates.

IMPORTANT: With the exception of the bevel gear (Y2, Fig. 31) and the spiral driving gears of the motor and clutch, **great care must be taken not to disturb or change the adjustment of any of the other gears in the machine**, as they are carefully ground and positioned to gauge at the factory and do not require any adjustment.

To Set the Needle Bar at the Correct Height

See that the needle is pushed up into the needle bar as far as it will go.

Turn the balance wheel over toward you until the lower timing mark on the needle bar connecting stud (U2, Fig. 30, page 34) is

To Set the Needle Bar at the Correct Height—*Continued*

centred on the top of the finger of the timing gauge (V2, Fig. 30) on the upward stroke of the needle bar. When the needle bar connecting stud (U2) is in this position, the needle bar should be set so that the top of the eye of the needle will be about $\frac{1}{16}$ inch below the point of the hook as shown at "X2" in Fig. 30.

In case the needle bar is not set at the correct height, loosen the screw in the lower end of the needle bar connecting link (T2, Fig. 29, page 33). (This screw can be reached when the needle bar is at its lowest point by inserting a screwdriver through the hole provided for the purpose in the arm). After loosening the screw, move the needle bar up or down in the needle bar connecting stud (U2, Fig. 30) until it is at the correct height, as instructed above, then firmly tighten the screw in the needle bar connecting link.

To Remove and Replace the Sewing Hook

To remove the hook, take out the centre screw (W2, Fig. 29, page 33) which holds the hook to the hook shaft and lift out the hook.

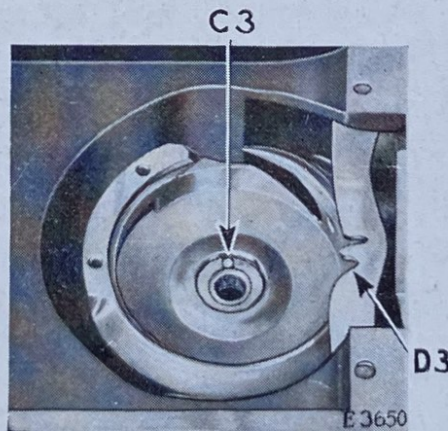


FIG. 32. SHOWING POSITION PIN IN NOTCH IN HOOK

When replacing the hook on the hook shaft, be sure that there is no dirt between the hook and shaft; also see that the small position pin (C3, Fig. 32) at the top of the hook shaft, enters the notch in the side of the shaft hole in the hook, then press down on the hook and fasten it firmly in position with the screw (W2, Fig. 29).

To Remove and Replace the Sewing Hook—*Continued*

When replacing the bobbin case in the hook, have the position finger on the bobbin case enter the front notch (D3, Fig. 32, page 36) in the position plate, then replace the rotating hook section (O2, Fig. 28, page 32) and fasten it firmly with the two screws (P2 and Q2, Fig. 28).

To Raise or Lower the Feed Dog

The feed dog should be set so that when it is raised to its highest point by the feed lifting rock shaft, the top of the feed points will be about $\frac{3}{64}$ inch above the top surface of the throat plate. At this height, slightly less than the full depth of the teeth will project through the feed dog slots in the throat plate.

When it is necessary to raise or lower the feed dog, remove the cloth plate, as instructed on page 32. Loosen the clamping screw (R2, Fig. 28, page 32) in the feed lifting rock shaft (back) and raise or lower the feed dog until it is at the correct height as instructed above, then firmly tighten the clamping screw (R2).

To Time the Feeding Mechanism

The feeding mechanism should be timed so that the feed dog will begin its forward movement (away from the operator) when the needle bar commences its downward stroke.

When it is necessary to time the feeding mechanism, remove the cloth plate as instructed on page 32. Then turn the feed regulating disc (F3, Fig. 33, page 38) over to the right as far as it will go, so that the numeral 6 will be at the front to make the longest stitch.

Loosen the two set screws in the feed eccentric (S2, Fig. 28, page 32) allowing one of the screws to bind slightly on the shaft, then turn the feed eccentric forward or backward, as may be required, until the feed dog is in time with the needle bar as instructed above. When the feeding mechanism is correctly timed, firmly tighten the two set screws in the feed eccentric (S2).

To Regulate the Length of Stitch

The length of stitch is regulated by the feed regulating disc (F3, Fig. 33) located on the bed of the machine at the right.

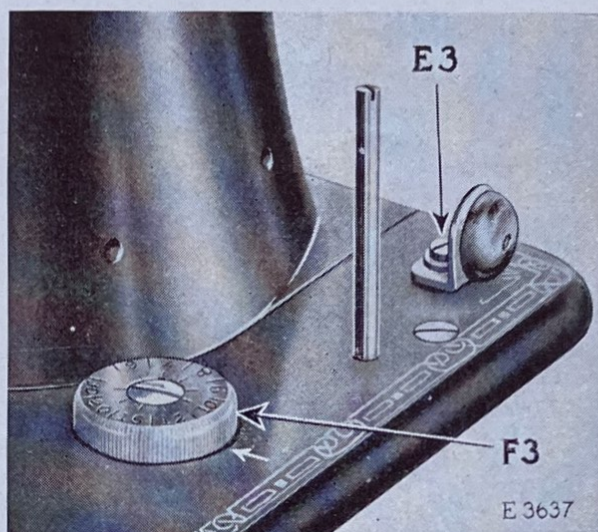


FIG. 33. SHOWING STITCH REGULATOR
ALSO ADJUSTMENT OF BOBBIN WINDER TENSION BRACKET

This disc is marked with arbitrary numbers ranging from 6 to 30, which indicate the various lengths of stitches that the machine will make, No. 6 being the longest stitch and No. 30 the shortest stitch. (The numerals do not denote the number of stitches to the inch). The length of stitch that the machine is ready to make is indicated by the number nearest the arrow marked on the cloth plate of the machine.

To increase the length of stitch, turn the feed regulating disc (F3) over to the right until the number of the desired length of stitch is nearest to the point of the arrow.

To shorten the stitch, turn the feed regulating disc over to the left until the number of the desired length of stitch is nearest to the point of the arrow.

To Adjust the Bobbin Winder Tension Bracket

If the thread does not wind evenly on the bobbin, loosen the screw (E3, Fig. 33) which holds the bobbin winder tension bracket on the cloth plate and move the bracket to the right or left as may be required, then firmly tighten the screw.

To Adjust the Bobbin Winder

If the pressure of the bobbin winder pulley against the hub of the balance wheel is insufficient for winding the bobbin, loosen

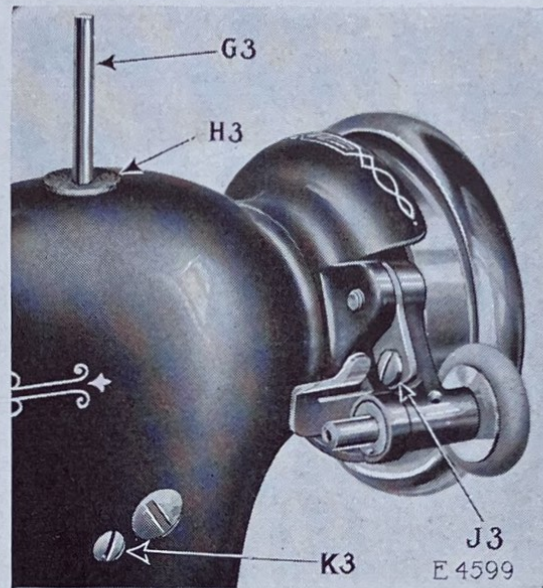


FIG. 34. ADJUSTMENT OF BOBBIN WINDER

the adjusting screw (J3, Fig. 34) and press down on the bobbin winder until the pulley is in contact with the hub of the balance wheel, then tighten the adjusting screw (J3). The pressure of the bobbin winder pulley against the hub of the balance wheel should be just sufficient to cause the bobbin winder pulley to rotate. Too much pressure will prevent the bobbin winder pulley rotating.

Slide Plate

When it is necessary to replace a slide plate in a cloth plate, this can be done by removing the cloth plate from the machine and slipping the slide plate into the slideway from the throat plate end, or, if desired, the slide plate can be replaced with the cloth plate attached to the machine by holding the slide plate at an angle of 45 degrees across the slide opening and slipping one end of the spring under one side of the slideway, then tipping the slide plate and slipping the other end of the spring under the opposite side of the slideway and swinging the slide plate around straight so that it will drop into position.

To Oil the Machine

To ensure easy running and prevent unnecessary wear of the parts which are in movable contact, the machine requires oiling,

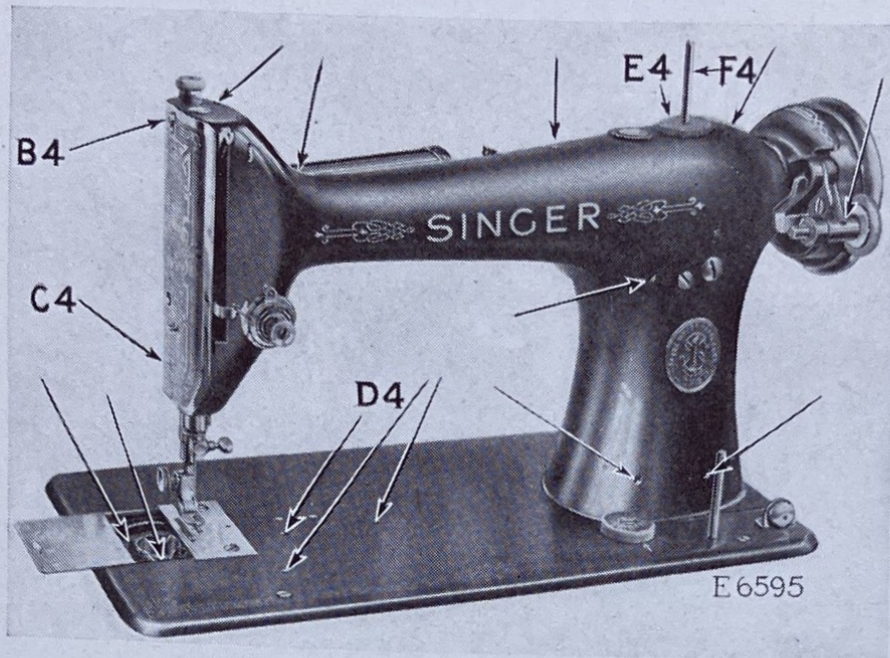


FIG. 35. FRONT VIEW, SHOWING OILING POINTS

and if used continuously, it should be oiled each day. With moderate use, an occasional oiling is sufficient. Oil should be applied at each of the places shown by arrows in Figs. 35, 36 and 37. One drop of oil at each point is sufficient, with the exception of the oil hole (D4, Fig. 35) into which hole about 12 drops of oil should be poured each time the machine is oiled. Oil holes are provided in the machine for bearings which cannot be directly reached.

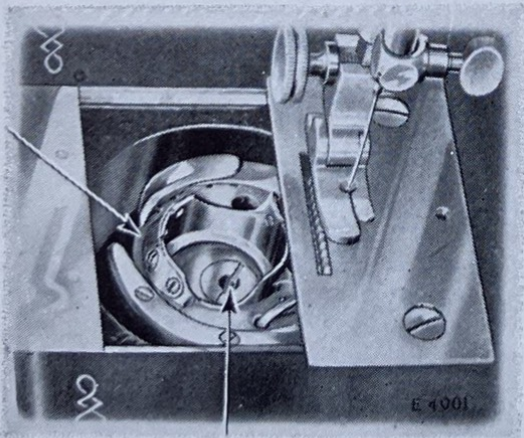


FIG. 36. VIEW OF SEWING HOOK SHOWING OILING POINTS

To oil the hook mechanism, draw to the left the slide in the bed of the machine and after removing the lint and dust which may have accumulated around the sewing hook, take out the bobbin and apply a drop of oil to the oil hole and bobbin case bearing, as indicated by arrows in Fig. 36 then replace the bobbin and slide plate.

To oil movable parts in the head of the machine, take out the screw (C4, Fig. 35) near the lower end of the face plate and loosen

the screw (B4, Fig. 35) near the upper end of the face plate, then raise the plate and slip it off over the head of the screw (B4).

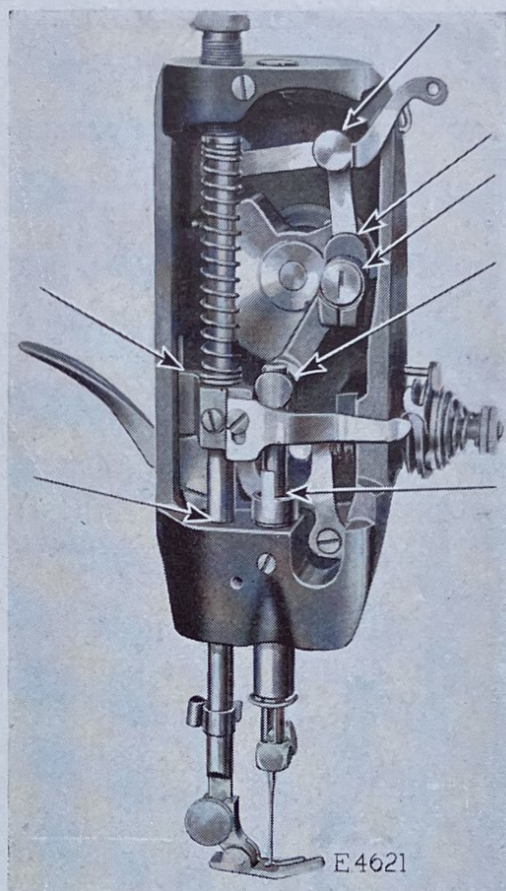


FIG. 37. END VIEW, SHOWING OILING POINTS

Put one drop of oil into each of the holes and joints thus uncovered as shown in Fig. 37.

To Lubricate the Motor

A tube of Singer Motor Lubricant is furnished with the machine for lubricating the gears of the motor. Occasionally remove the felt washer (E4, Fig. 35) and unscrew the spool pin (F4, Fig. 35), then insert the tip of this tube into the spool pin hole and force a small quantity of the lubricant through the hole to lubricate the gears, then replace the spool pin and felt washer. **Under no circumstances should oil be used at this hole, but only the lubricant.**

1. When the machine is shipped from the factory, the two motor grease cups (QQ, Fig. 20, page 24) are filled with sufficient lubricant for approximately one year's use, under ordinary circumstances.

2. At least once a year thereafter, these grease cups should be removed, thoroughly cleaned out and refilled with the Singer Motor Lubricant, furnished with the machine. To do this, the motor must be removed from the machine.

3. To remove the motor:

- (a) Remove the motor cover (C, Fig. 2, page 8).
- (b) Remove the screw (K3, Fig. 34, page 39) which holds the motor.
- (c) Withdraw the entire motor (see Fig. 20, page 24) from the machine by turning it slightly from side to side and at the same time pulling it toward you. The motor should only be withdrawn far enough to expose the two grease cups (QQ, Fig. 20). **Do not disconnect any of the electric wiring of the machine or the motor).**

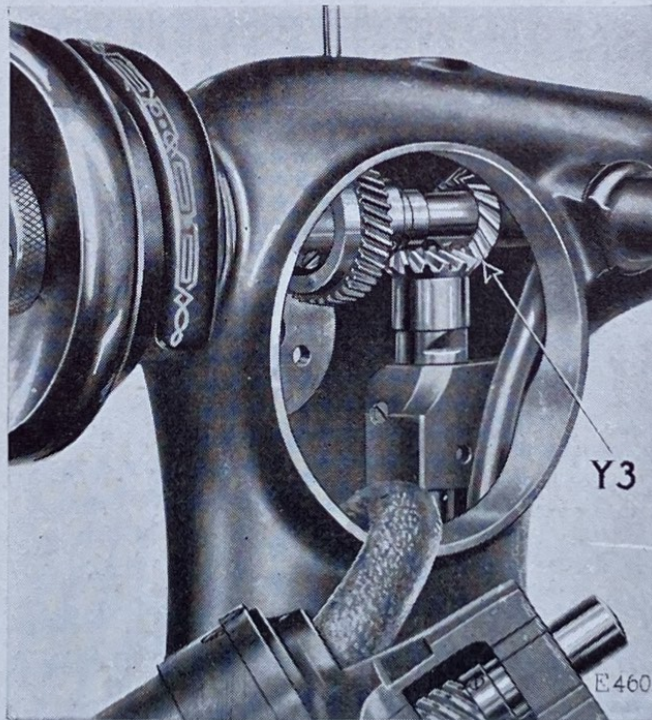


FIG. 38. BACK VIEW, SHOWING BEVEL GEARS
IN ARM OF MACHINE

- (d) Unscrew the two grease cups (QQ, Fig. 20).
- (e) Both the wicks and the interior of the grease cups should be thoroughly cleaned of all old grease. Then replace the wicks in the cups and refill the cups with Singer Motor Lubricant (**not oil**).
- (f) Fill the well in which the spiral pinion (U, Fig. 21, page 25) revolves, with Singer Motor Lubricant (**not oil**).

- (g) Apply Singer Lubricant to the teeth of the two bevel gears (Y3, Fig. 38) next to the spiral gears. The greasing of these two bevel gears should be done at the same time the motor cups are refilled, inasmuch as they can only be reached when the motor has been withdrawn from the sewing machine head.
- (h) Replace the grease cups, being sure that the wicks (PP, Fig. 20, page 24) enter the small holes which lead to the armature shaft.
- (i) Replace the motor in the machine.
- (j) Replace the screw (K3, Fig. 34). The final position of the motor has an important bearing on the free running of the machine, and it may be necessary to slightly shift the motor to the left or right before the final tightening of the screw (K3).

To Lubricate the Bevel Gears

1. There are three sets of bevel gears in the machine, as shown at (Y3, Fig. 38) and (Z3 and A4, Fig. 39). These bevel gears

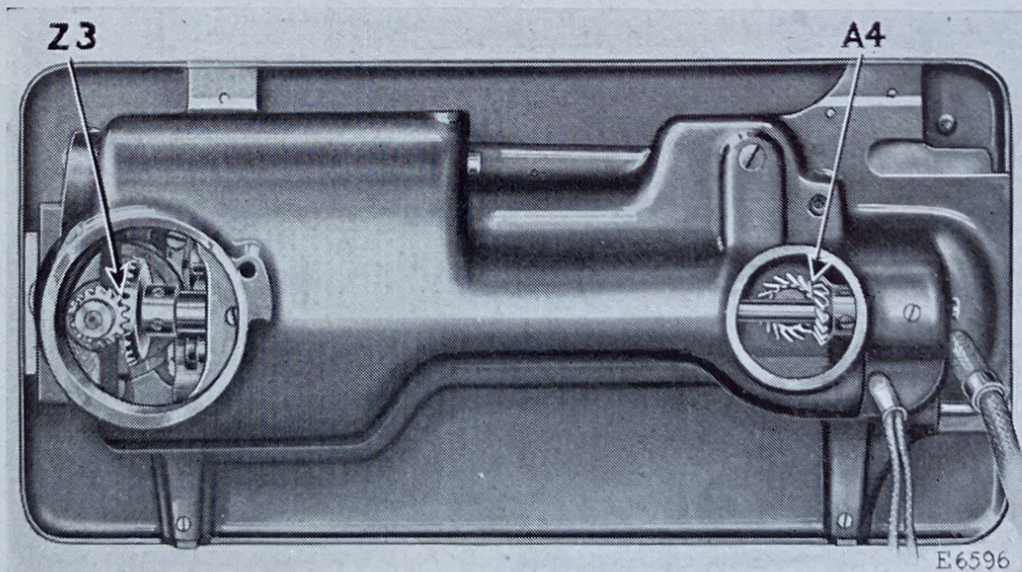


FIG. 39. BASE VIEW, SHOWING BEVEL GEARS
IN BED OF MACHINE

should be greased once a year—preferably at the time of greasing the motor, or whenever they become dry, as indicated by a grinding sound.

2. The method of greasing the upper set of bevel gears (Y3, Fig. 38), i. e., those which are located in close proximity to the motor itself, has been explained under the heading "To Lubricate the Motor."

3. The two lower sets of bevel gears (Z3 and A4, Fig. 39) are exposed by removing the two round sheet metal covers located in the bottom of the machine. This can be done with a small screw driver.

4. Singer Lubricant should be applied to the teeth of these two sets of gears in the same manner as described for the upper bevel gears in paragraph 3 (g), page 43, under the heading "To Lubricate the Motor."

5. Replace the sheet metal covers.

