GUIDE BOOK ON USE AND CARE OF YOUR

ZIGZAG SEWING MACHINE

MODEL 2137
Congratulations on your choice of a zigzag sewing machine. With this versatile White de luxe machine it is possible to progress from the simplest sewing performance to many kinds of artistic needlework. All that is required is a thorough understanding of its functions and familiarity with its operation.

This book was written to aid you in obtaining the greatest achievement from your new White zigzag. Read the instructions carefully and keep them for ready reference as you change from one type of work to another. Your reward will be many hours of trouble-free sewing, resulting in clothes and furnishings for your home that reflect your own personality.

Time-saving attachments such as rufflers, binders, edgestitchers and cording feet, to complement the accessories furnished with your machine, are available from franchised dealers and department stores.

WHITE SEWING MACHINE CORPORATION
CLEVELAND 11, OHIO

White Sewing Machine Products Ltd.
Toronto 16, Ontario, Canada
INDEX

Features and Parts ................................................. 2-5
Needle and Thread Chart .......................................... 6
Setting the Needle .................................................. 7
Winding the Bobbin ................................................. 7-8
Threading the Bobbin Case ........................................ 8
Placing Bobbin Case in Shuttle ................................... 9
How to Thread the Machine ....................................... 10-11
  Single Needle ..................................................... 10-11
  Twin Needles ..................................................... 11
Straight Stitching .................................................. 12-13
  Changing Foot and Plate ....................................... 12
  Setting Stitch Width at 0 ...................................... 13
  Setting the Stitch Length ..................................... 13
Stitch Length Chart ................................................ 13
Sewing in Reverse .................................................. 14
Adjusting the Tensions ............................................ 14-15
Adjusting the Pressure and Feed ............................... 15-16
  General Sewing ................................................... 15
  Light Weight Fabrics .......................................... 15
  Darning and Monogramming ................................... 16
Preparing to Sew ................................................... 16-17
Removing the Work ................................................ 17

Zigzag Stitching .................................................. 18
Creative Embroidery .............................................. 19
Sample Embroidery Patterns ..................................... 20-21
Twin Needle Embroidery ......................................... 21-22
Embroidering with a Hoop ....................................... 23
Making Buttonholes .............................................. 23-25
Sewing on Buttons ................................................ 25-26
Hemming with the Zigzag Stitch ............................... 27
How to Use Accessories ......................................... 28-30
  Narrow Hemmer .................................................. 28
  Lace Trimmed Hem ............................................ 28
  French Seam ...................................................... 29
  Flat Felled Seam ............................................... 29
  Hand Rolled Effect ............................................. 29
  Quilting Guide .................................................. 29
  Seam Gauge ....................................................... 30
Care and Maintenance ............................................. 30-33
  Oiling .............................................................. 30
  Replacing Light Bulb ......................................... 32
  Changing the Belt .............................................. 32-33
Cleaning and Oiling the Shuttle ............................... 33-34
Check Up for Smooth Sewing ................................. 35-36
FEATURES AND PARTS
(Front View)

1. Spool Pins
2. Hand Wheel
3. Wheel Clutch
4. Bobbin Winder
5. Stitch Width Indicator
6. Stitch Width Locks
7. Stitch Width Lever
8. Stitch Length Dial
9. Reverse Stitch Button
10. Stitch Length Indicator
11. Bobbin Winding Tension
12. Drop Feed Knob
13. Bed
14. Needle Plate—Seam Guide
15. Hinged Cover Plate
16. Presser Foot—Zigzag
17. Foot and Attachment Screw
18. Needle Clamp
19. Needle Bar Thread Guide
20. Face Plate Thread Guide
21. Tension Regulator
22. Face Plate
23. Arm Thread Guide
24. Take-up Lever
25. Pressure Release—Darner
26. Built-in Handle
FEATURES AND PARTS

Back View.

27. Presser Bar Lifter
28. Thread Cutter
29. Feed
30. Light Housing
31. Light Bulb Button

32. Light Switch
33. Motor
34. Pulley
35. Belt
### NEEDLE - THREAD - FABRIC - STITCHING GUIDE

<table>
<thead>
<tr>
<th>Fabric</th>
<th>Needle No.</th>
<th>Machine Stitches Per Inch</th>
<th>Mercerized Thread</th>
<th>Silk or Nylon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extremely heavy tarpaulin, sacking, canvas, duck, etc.</td>
<td>4</td>
<td>to</td>
<td>to</td>
<td>Heavy Duty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Heavy upholstery fabric, ticking, denim, leatherette</td>
<td>3</td>
<td>to</td>
<td>to</td>
<td>Heavy Duty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>8</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Medium heavy drapery fabric, velveteen, suiting, felt, terry, etc.</td>
<td>2</td>
<td>to</td>
<td>to</td>
<td>Heavy Duty</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Medium broadcloth, percale, gingham, linen, chintz, taffeta, sheer wool, shantung, etc.</td>
<td>12</td>
<td>12</td>
<td>60</td>
<td>50 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Sheer voile, lawn, dimity, crepe, handkerchief linen, plastic film, etc.</td>
<td>16</td>
<td>14</td>
<td>80</td>
<td>50 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>16</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Plastic film</td>
<td>8</td>
<td>0</td>
<td>to</td>
<td>50 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Very sheer chiffon, batiste, lace, organdy, ninon, net, marquisette, etc.</td>
<td>00</td>
<td>16</td>
<td>100</td>
<td>50 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>to</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>150</td>
<td></td>
</tr>
</tbody>
</table>

When doing embroidery work, finer results will be obtained with machine embroidery thread regardless of the weight of fabric.
SETTING THE NEEDLE

See Fig. 3. Raise the needle bar A to its highest point, turning wheel toward you by hand. Then loosen the needle clamp screw B and the needle clamp C will open. Place needle flat side to back in the needle clamp and push it upward as far as it will go into the needle clamp hole, fastening the needle clamp securely with a screw driver.

WINDING THE BOBBIN

Disengage the hand wheel (Fig. 4) from the stitching mechanism by turning the clutch toward you or counterclockwise. Place a spool of thread on one of the spool pins, lead thread under the handle and through the upper thread guide on the arm, and down through the tension disc (11, Fig. 5) at the base of the machine. Run end of thread through a hole in the bobbin edge and place bobbin on spindle B of winder 4, fitting the notch on bobbin over small pin on spindle. Push
bobbin winder pulley against hand wheel. Hold thread end loosely and start machine slowly. Bobbin will be released automatically when it is filled. Break off loose thread end used to start the winding.

Turn clutch away from you until sewing mechanism is again engaged so that needle moves when you turn the hand wheel.

If the bobbin winds unevenly, adjust bobbin winding tension disc to the right or left by loosening the screw. When disc is in proper position, tighten screw.

THREADING THE BOBBIN CASE

Refer to Figs. 6, 7 and 8 to familiarize yourself with the procedure. Hold the bobbin case in your left hand. Let about two inches of thread hang free from the bobbin, and insert bobbin into case so that thread will be rotating counterclockwise. Guide the thread end through the slot on the side of the case and under the tension spring until it enters the small notch on the edge of the spring.
PLACING BOBBIN CASE IN SHUTTLE

Open hinged cover plate in front of the needle. (See 15, Fig. 1). Hold the bobbin case latch, D, Fig. 9, between the thumb and forefinger of the left hand, with at least three inches of thread running from the top of the bobbin case to the right. Insert and center the bobbin case on the stud of the shuttle body, C. Be sure the bobbin case finger, E, is opposite shuttle race notch, A. Press the bobbin case into the shuttle as far as possible until latch catches on the center post of shuttle. THEN release the bobbin case latch, D). Press bobbin case again after latch has been released to make sure the bobbin case is locked securely in place. Close the cover plate.
HOW TO THREAD THE MACHINE
(Single Needle, Fig. 10)

Turn hand wheel toward you to raise take-up lever to highest position.

1. Place a spool of thread on spool pin A,
2. lead thread through eyelet in arm thread guide B,
3. pass the thread down and around tension discs C from right to left
4. into check spring D
5. then tug on thread to pull it around and into hook E (Fig. 11)
6. lead up to take-up lever F, threading from right to left,
7. down into thread guide G
8. into needle bar guide H
9. and through needle I from front to back.
Pull about four inches of thread through needle. Hold thread end and turn hand wheel toward you. As the needle goes down and comes up again, the bobbin thread will be drawn up in a loop, see Fig. 11. Grasp both threads and pass under presser foot toward back of machine.

THREADED TWIN NEEDLES
See Fig. 3 for inserting needles.

Follow above procedure with these exceptions:
Place thread, matching or contrasting in color, on both spool pins. Draw threads through separate eyelets in upper arm thread guide B. Pass threads from right to left through front and back tension discs and into check spring D, then into hook E. Now treat both threads as one until you reach the needle eyes. Pass thread from the spool on the left through left needle and the thread from the right spool through the right needle.

Extra twin needles may be purchased from your sewing machine dealer.
STRAIGHT STITCHING

For straight sewing on fine fabric or very soft material, it is advisable to use the straight stitch presser foot and the straight stitch needle plate which are included in your accessory box. Both have narrow needle slots.

Changing the Foot and Plate. To change presser foot (16, Fig. 1) loosen thumb screw 17 and remove zigzag foot. Replace with hinged straight foot and tighten screw securely.

To change needle plate (14, Fig. 1) remove screw and lift off with cover plate 15 attached. Hold needle plate with left hand and cover plate with the right. (Fig. 12) Press upper corner of cover plate (right side up) down slightly and slip pin from groove in needle plate. Avoid using too much pressure. When the pin is released the two plates will separate.

Attach cover plate to straight stitch plate by reversing the above procedure.

Slip pin on lower side of cover plate into groove on needle plate. Insert tongue into square opening and slide upper pin into position. Put plates on machine and fasten securely with needle plate screw.
Be sure to set the stitch width at 0, or the needle will break in striking the foot or plate. Push the zigzag lever 7, Fig. 13, all the way to the left so that pointer is over 0 in stitch width window.

Set both locks, 6, as far to the left as possible. To move locks, pull knobs slightly and slide, then release.

SETTING THE STITCH LENGTH

The length of the stitch is regulated by the dial A shown in Fig. 14. Near 0 is the shortest stitch and 6 is the longest. Turn the dial to the left to lengthen and to the right to shorten the stitch.

STITCH LENGTH CHART (Approximate)

<table>
<thead>
<tr>
<th>Figures on dial</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of stitches per inch</td>
<td>No Feeding</td>
<td>36</td>
<td>20</td>
<td>12</td>
<td>9</td>
<td>7</td>
<td>5</td>
</tr>
</tbody>
</table>

--- 13 ---
SEWING IN REVERSE

When you wish to sew backward to tie the threads at the beginning or end of a seam, press in the reverse button B, Fig. 14, as far as it will go. The machine will sew backward as long as the button is held in.

ADJUSTING THE TENSIONS

Always adjust the upper tension with the presser foot down, as the tension is automatically released when it is raised. To increase the tension on the upper thread, turn dial Fig. 15 to the right, or clockwise. To decrease, turn to the left. The higher the number on the dial the tighter the tension.

Before adjusting lower tension be sure that the machine is threaded properly. When necessary to change the bobbin tension, turn small screw (Fig. 16) on side of the bobbin case clockwise to tighten, counterclockwise to loosen.
When the upper and under tensions are properly balanced, a perfect stitch will be formed with both threads interlocking in fabric. Fig. 17.

When the upper tension is too tight, the lower thread is pulled up over the upper thread which is lying flat on the fabric. When the under tension is too tight, the upper thread forms loops over the lower thread lying flat on the fabric.

ADJUSTING PRESSURE AND FEEDING OF FABRIC

General Sewing. Usually for straight sewing and manual embroidery, the pressure bar cap or darning release, B, Fig. 18, is at its lowest position and the feed is at its highest level, with the red triangle on the drop feed knob A, Fig. 19, turned to REG.

Sewing Thin or Light Weight Fabrics. When lighter pressure is required to sew satisfactorily on thin silk or filmy material, the pressure cap should be about halfway down. Release all the way by pressing the snap lock, A, Fig. 18, and then press cap
B down again to halfway spot. Lower the feed slightly by turning the drop feed knob to SILK.

**Darning and Monogramming.** In order to move the fabric freely in any direction for darning, mending and certain kinds of free-hand embroidery, release the pressure cap B completely by pressing down on the snap lock, A, Fig. 18. Turn the drop feed knob to DARN position, which drops the feed well below the needle plate. To return feed to normal, turn knob to REG.

**PREPARING TO SEW**

Have take-up lever at highest point before starting to sew. Do not try to help the feeding by pulling the material as this may deflect the needle and cause it to break.

*NEVER* run machine without material between presser foot and feed. Place material and threads in position under the presser foot and lower the presser foot. Turn the hand wheel toward you until the needle is at its highest point. You are now ready
to begin sewing. By having the needle at its highest point it is not necessary to touch the hand wheel to start the machine. You merely press the control. The speed of the machine is regulated by increasing or decreasing the amount of pressure exerted on the control.

REMOVING THE WORK

Be sure to stop the machine when the thread take-up lever and needle bar are located at the highest position. Now raise the presser foot and draw the fabric back and to the left, Figs. 20 and 21, and pass the threads over the thread cutter. Pull down slightly, holding thread in both hands, so as not to bend the needle. Leave the ends of thread under the presser foot.
ZIGZAG STITCHING

Setting the Stitch Width and Locks. Move zigzag lever 7, Fig. 22, clear over to right edge of its channel. Pull left stop, 6, out slightly and slide it to the right until the black pointer on the lower part of indicator, 5, is under the width required. Then move lever, 7, back to the left until it forces left lock to snap into its groove. The red pointer on the upper part of the indicator is then above the number stitch width required.

To set the right stitch width lock, move lever to the left and slide the lock toward the right to the width required. Move lever back to snap lock into its groove.

When the left and right locks are set at two different widths the zigzag lever can be moved freely between the two settings.
CREATIVE EMBROIDERY

Be sure zigzag presser foot and zigzag needle plate are in place.

The satin stitch, Fig. 23, which is really just a very short zigzag stitch, and the basis for most embroidery, is obtained by setting the stitch length as near 0 as possible without stopping the feeding action. The width may be set anywhere from just past 0 to the widest, 4, for single needle work. For twin needles the stitch width must be no wider than No. 1½ setting. When using twin needles, always turn hand wheel manually until you are sure needles clear the needle hole.

Embroidery Patterns.

With the machine set for a short stitch length, different designs can be made by swinging the stitch width or zigzag lever back and forth between 0 and 4 or any other combination of widths. Try setting the locks at 1 and 4, 2 and 4, etc. Set a rhythm for yourself and then proceed. After a while you will become quite skillful, varying your designs by the speed of the machine, stitch length and width, and the manipulation of the lever. Always run the machine at a uniform speed, whether fast or slow.
The following patterns will be altered by the machine speed. At slow speed the patterns will be shorter than at moderate or fast speed.

A. Sew a few stitches at 5\( \frac{3}{4} \) width, then quickly move lever back to 0 for a short period. Count, if necessary, to establish a rhythm.

B. Set width locks at 1\( \frac{1}{2} \) and 4, then move lever slowly between settings, operating machine rather fast.

C. Set width locks at 1 and 4. Gradually move lever from 1 to 4, then snap it back quickly to 1.

D. Set locks at 1 and 4. Operate machine at moderate speed. Stitch at 1 while you count "1, 2, 3." Then stitch at 2\( \frac{1}{2} \) and 4 for the same count. Return to 2\( \frac{1}{2} \) and 1. Repeat.
E. Drop feed, lock stitch width at 4, take 3 or 4 stitches, leave needle in fabric left of stitches. Pivot fabric on needle to make next daisy petal. Continue until flower design is complete. Lock threads by setting stitch width at 0 and taking 3 or 4 stitches in center of design.

**Twin Needle Work** (See Figs. 24 and 25)

Variations of the designs shown in Fig. 24 (with the exception of the daisy) may be done with twin needles **when the right stitch lock is set on No. 1½ width.** Always turn the wheel by hand to be sure needles do not strike either side of the needle plate hole.

A. Set locks at 0 and 1½. Move lever at even pace from 0 to 1½, and back. Keep repeating in rhythm.

B. Set stitch length at 2, the stitch width at 1. Do a few zigzag stitches, drop feed for 3 or 4 stitches, then raise feed quickly. By operating the feed knob rhythmically, it is not necessary to count stitches to obtain uniformity of pattern.

C. Set width locks at ½ and 1½. Sew a few stitches at 1½, then quickly move lever to ½. Repeat the back and forth movement while running machine rather slowly.
D. Set locks at 0 and 1½. Gradually move lever from 0 to 1½, then snap it back quickly to 0. The speed of the machine will govern the length of the triangular pattern.

E. Set the stitch length at 1, then follow directions for pattern A.

For double rows of straight stitching, lengthen the stitch and set the stitch width at 0, with lever as far to the left as it will go. Keep the zigzag foot on the machine.
EMBROIDERING WITH A HOOP

It is easy to follow a stamped design or to work free hand when embroidering or monogramming. (See Fig. 26). Release the pressure from the foot by pressing down the snap lock on the automatic darter. Turn the drop feed knob to "DARN" position. Stretch the fabric in an embroidery hoop, and place under the needle after removing the presser foot. Set the stitch width at the size you prefer and lower the presser bar lifter. Then operate machine at a rather high speed while moving the hoop slowly with both hands. Work carefully and be sure to keep fingers out of the path of the needle.

MAKING BUTTONHOLES

First, mark the beginning and end of the buttonhole on fabric with a basting line or tailor’s chalk. Make one on scrap fabric (following directions below) to be sure machine adjustments are correct.

1. Replace presser foot with buttonhole foot which is grooved deeply underneath to
prevent piling up of thread. (See Fig. 27.)

2. Lock the stitch width at 2 with the left stop, and at 4 with the right stop. Set the stitch length near 0.

3. Lower needle carefully into the mark on fabric indicating the beginning of buttonhole. Stitch to the mark for the end of the buttonhole, step 1, Fig. 28, stopping machine with needle in fabric at right side of stitching.

4. Lift the presser foot and using the needle as a pivot, turn the fabric end for end.

5. Lower presser foot and turn hand wheel just enough to raise needle out of fabric.

6. Turn feed knob to DARN and move zig-zag lever to 4. Take five or six stitches to form bar tack, step 2, Fig. 28.


9. Make bar tack by repeating 5 and 6 above (step 4).

10. Return stitch width to 0 and take two or three stitches to fasten bar threads and prevent raveling. Cut the buttonhole opening with the seam ripper, being careful not to cut the stitching.

If you plan to make buttonholes on sheer or soft material, place tafletan or paper, which can be torn away after stitching, under the fabric. And it is always wise to make several buttonholes on scraps of fabric before working on the garment.

For narrower buttonholes, set the left stitch width lock at less than 2, the right lock at the setting which will produce a bar tack twice as wide as one bank of buttonhole stitching.

SEWING ON BUTTONS

1. Remove hinged presser foot and attach button sewing foot. See Figs. 29A, B and C.

2. Turn drop feed knob to DARN.

3. Move zigzag width lever to 0 position or to the extreme left. Place button so that its left hole comes directly under the needle, then gently lower the presser foot.
Move the zigzag width lever to the right until needle comes exactly over the right hole of the button. Turn the balance wheel slowly back and forth by hand to be sure needle drops freely through both holes of the button. Lock stitch width, either at right or left.

4. Run the machine at medium speed, making five or six stitches, stopping with the needle in the left hole.

5. Move the lever to the left or to 0. Finish off with a few stitches. If you wish you may place a rounded toothpick over the button, between the two holes, and sew button to fabric in regular way. Remove toothpick and wind thread under button, forming a shank. Fasten.

If a four hole button is to be sewn, follow the same procedure above for the two hole button. Now lift presser foot slightly and move fabric to permit stitching the remaining two holes. Hooks, snaps, etc., are sewn to the fabric with the same procedure as for sewing two hole buttons.
HEMMING WITH THE ZIGZAG STITCH

Heavy cr pile fabrics such as tweed, camel's hair, felt and velveteen can be hemmed neatly and softly with a zigzag stitch. Smooth, figured material may be finished in the same way as the sidewise stitches will be barely noticeable and the fabric will hang as if hemmed by hand.

Prepare fabric for hemming either by stitching seam tape to the right side, or by folding the fabric under one half inch. Stitch one fourth inch from the edge with a normal straight stitch.

Press hem in place. Then fold the garment or large part of the fabric back on the hem fold. Let the edge of the hem extend beyond the folded fabric one-quarter inch. Hold in place with pins set crosswise every three to five inches, Fig. 30.

Set stitch length at 6, the stitch width at about 2. Test on a scrap of the fabric to be hemmed to determine what stitch width would be best. A narrow zigzag stitch will show less on the right side, but thicker fabrics require a wider stitch.

Place material under zigzag presser foot with the quarter-inch extension to the right. Guide fold of garment between the prongs of the presser foot.

Operate machine slowly in order to guide the fabric so that only the left side of the zigzag pattern catches the fold. The right side of the stitch should be only on the quarter-inch extension of the hem.
HOW TO USE ACCESSORIES

NARROW HEMMER. With the needle at its highest position, replace regular presser foot with narrow hemmer (Fig. 31). For a plain narrow hem, make a 1 8-inch double fold for about two inches along edge of fabric. Hold each end of the two inch fold, slip underneath hemmer. Bring fold up into the scroll of hemmer, draw forward to end and fasten with point of needle. Lower presser bar lifter.

Gently pull ends of thread as you start stitching. Guide material slightly to right, and it will automatically take a double turn through scroll.

LACE TRIMMED HEM. To sew a narrow hem and attach lace in one stitching, insert lace in the slot next to needle (Fig. 32). Sew hem as above, guiding lace under needle and hem into scroll.

LACE EDGE WITH INVISIBLE STITCHING. Hold
lace 1 8-inch from raw edge on right side of fabric. Insert both in scroll as for plain narrow hem (Fig. 33). Let hem roll over and sew in lace. Press lace out flat along edge with hem turned up.

It is possible to have a little fullness in lace by feeding it freely under scroll.

FRENCH SEAM. With right sides together, place top piece of material 1 8-inch inside edge of lower piece.

Insert in hemmer scroll, allowing hem to roll over, and sew in top fabric, making French seam.

FLAT FELLED SEAM. Open out French seam and insert rolled edge in scroll of hemmer. Edgestitch to lay seam flat.

HAND ROLLED EFFECT. Use a narrow zigzag stitch at approximately a #3 stitch length. It should be just wide enough to catch both edges of the narrow rolled hem.

QUILTING GUIDE. This guide for making parallel rows of stitching is attached by placing the pronged holder between the presser foot and the presser foot clamp screw (Fig. 34). Adjust the curved bar to press lightly on the fabric. By letting the guide
ride on the first stitching line, successive rows will be an equal distance apart. When the bar is attached so that the curved part is to the right of the needle, it may also serve as a seam width guide.

SEAM GAUGE OR CLOTH GUIDE. Use the seam gauge as a guide for straight seams and even rows of top stitching along edges of fabric. Fasten gauge with accompanying screw in threaded hole in needle plate or in bed of machine (Fig. 35). Adjust to seam width desired.

CARE AND MAINTENANCE OF YOUR MACHINE

HOW TO OIL YOUR MACHINE

Your machine should be oiled occasionally to keep it operating smoothly — how often depends on the amount of sewing you do. Oil the upper part of the sewing unit at points indicated by arrows in Fig. 36. Avoid over-oiling — only a drop is needed at each point.
Occasionally remove the top cover by removing screws and oil moving parts not accessible through oil holes, Fig. 37.

To oil parts under the bed of the machine, tip the unit back on its hinges and apply a drop of oil at each point indicated in Fig. 38.

To oil moving parts inside the face plate, which only rarely require oiling, remove plate by taking out the screws. Oil at spots indicated in Fig. 39.

Use gear lubricant on gears indicated by white arrows in Figs. 37 and 38. Lubricate only when machine seems to sew more slowly than usual.
HOW TO REPLACE LIGHT BULB

Grasp light bulb button (see 31, Fig. 2) and pull light bracket downward. Unscrew bulb and replace with bulb of same size, which is available from your sewing machine dealer.

HOW TO CHANGE THE BELT

If it should ever become necessary to replace the belt on your machine, the hand wheel must first be loosened and moved out.

To do this, follow these instructions:

1. Remove clutch nut A in center of wheel by taking out the small screw B near the edge, Fig. 40. Turn nut counterclockwise until it can be lifted off.

2. Before moving the hand wheel, note the position of the washer, C, Fig. 41, which fits under the clutch nut. It may fall out when you are changing the belt.

3. Pull hand wheel away from the machine carefully, Fig. 42. Pull it just far enough to make the grooved section which holds the belt accessible.

4. Slide old belt over hand wheel and over pulley on the end of motor.
5. Slide new belt into grooved section and over motor pulley.
6. Push hand wheel back against the machine.
7. If washer C has fallen off, replace so that the lips D, Fig. 41, are pointing toward the clutch nut.
8. Replace nut and tighten screw securely.

   After doing this, turn the clutch toward you to disengage the sewing mechanism. If the needle still moves up and down as you turn the hand wheel, again remove the clutch nut. Give the washer a half turn and replace the nut.

CLEANING AND OILING THE SHUTTLE
See Figs. 43 and 44.

The stitch forming mechanism occasionally becomes clogged with loose threads and lint. This will interfere with the efficient operation of the machine. Cleaning and removal of the lint will safeguard the performance.

To remove the shuttle assembly, proceed as follows:
1. Turn the balance wheel until the needle reaches its highest position. Tilt head back on its hinges.
2. Remove bobbin case (A), Fig. 43.
3. Turn the two shuttle race cover clamps (B) outward and remove the shuttle race cover (C) and shuttle body (D).

4. Clean the shuttle race, the shuttle, and shuttle race cover by removing all threads, lint, etc.

5. Apply a drop of oil with finger tip to outer edge of shuttle.

When the cleaning has been completed, proceed as follows to replace the shuttle assembly:

1. Turn the balance wheel until the needle reaches its highest position.

2. Place the shuttle body (D, Fig. 44) against shuttle driver and adjust into position.

3. Replace shuttle race cover, (C), fitting pin at lower edge into notch, and lock into position with shuttle race cover clamps, (B), making certain the clamps have been snapped securely into position.


5. Put the bobbin case into the shuttle race, fitting tongue into notch E, Fig. 43, of race cover.
CHECK UP FOR SMOOTH SEWING

Although your sewing machine is designed for maximum efficiency, should any of the following difficulties occur they can be remedied with minor adjustments.

Upper Thread Breaks
- Be sure needle is inserted properly.
- Check on correct way to thread machine.
- Use correct needle size for thread.
- Do not have upper tension too tight.

Lower Thread Breaks
- Check correct method of threading bobbin case.
- Be sure lower tension is not too tight.

Needle Breaks
- Do not tug or pull on the fabric while sewing as this will bend 'and eventually break the needle.
- Be sure presser foot is firmly attached to bar.
Skipped Stitches
Do not use a blunt or bent needle.
Insert needle correctly.
Use correct needle size for thread.
Be sure pressure on foot is sufficient when sewing heavy fabrics.

Stitches Loop
Make sure tensions are properly balanced and that machine is threaded correctly.

Machine Binds
Clean thread, dust and lint from hook, shuttle and race.
If condition continues it may be that the machine is gummy with oil. Apply kerosene to oil holes, run rapidly for a while, and wipe dry. Then lubricate again with fine sewing machine oil.