

Service Bulletin

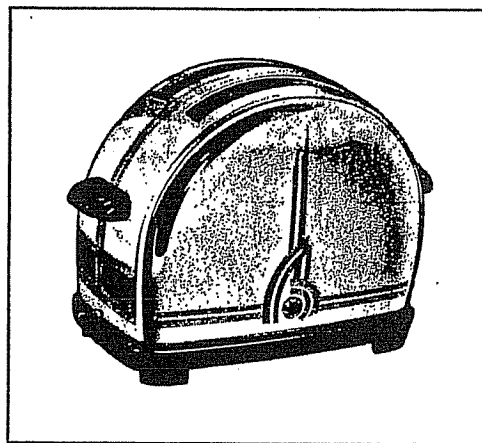
1298

Supersedes Service
Bulletin No. 24
Revised April 8, 1941

No. 17-2 TOASTER

January 3, 1949

INSTRUCTIONS FOR SERVICING SUNBEAM SILENT AUTOMATIC TOASTER MODEL T9



GENERAL

The Model T9 Sunbeam Silent Automatic Toaster differs from previous Sunbeam toasters in design and in the addition of a selective "pop-up" feature by which the toast may be made either to rise automatically or to remain inside the toaster at the end of the toasting period by the setting of a control knob. The thermostat timing mechanism is so arranged that it will toast bread to the same reasonably uniform degree of brownness whether the toaster is hot or cold. No toaster, however, will automatically and effectively compensate for voltage fluctuations or for considerable differences in bread (as between whole wheat and white bread, or fresh and dry bread), but such variations can be taken care of by a change in the setting of the Bakelite adjustment knob on the side of the Sunbeam Toaster. For large voltage variations a second adjustment can be made readily as described in the Toaster instruction booklet, (one of these booklets is attached to next page) and as explained in Section 3N-3 of this bulletin.

The thermostat is located at one end of the toasting chamber and the "pop-up" mechanism at the other. The hinged crumb-plate under the toasting chamber is easily opened for cleaning. The wiring diagram on the next page shows the

electrical circuit connections as arranged in the 110-120 volt and 125-130 volt Model T9 Toasters.

Note: The front of the Toaster is the side with the signal light; which places the movable handle and thermostat adjustment knob on the right side and the fixed handle and "pop-up" control knob on the left side when the user faces the front of the Toaster. USE ON ALTERNATING CURRENT ONLY.

HOW TO SERVICE MODEL T9 SUNBEAM AUTOMATIC TOASTER

1. Normal Operation

Plug toaster cord into electric power circuit of same voltage as that marked on name plate at bottom of toaster. The electric power circuit must have sufficient capacity for supplying the Toaster with the wattage it requires — 1100 watts. When the movable handle (see Key Number 15 on illustrated parts list attached to this bulletin) is lowered the switch closes, all elements will heat to a cherry red color, and the signal light will glow.

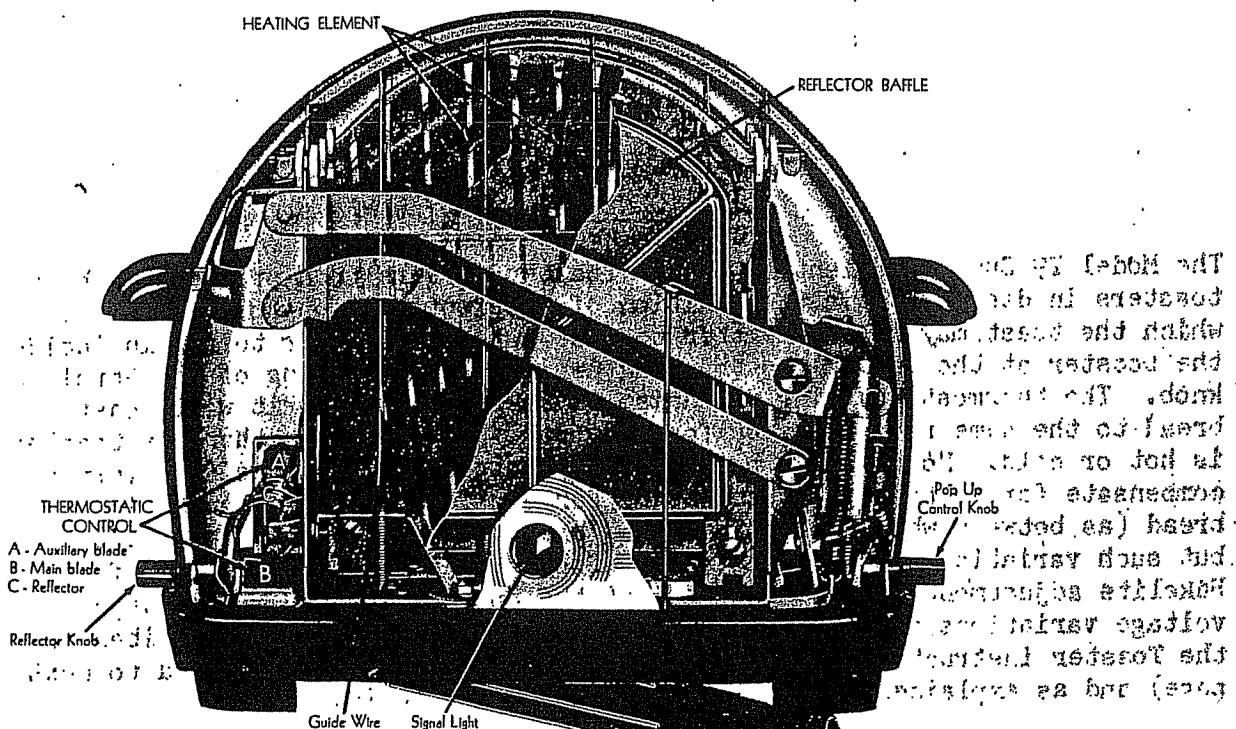
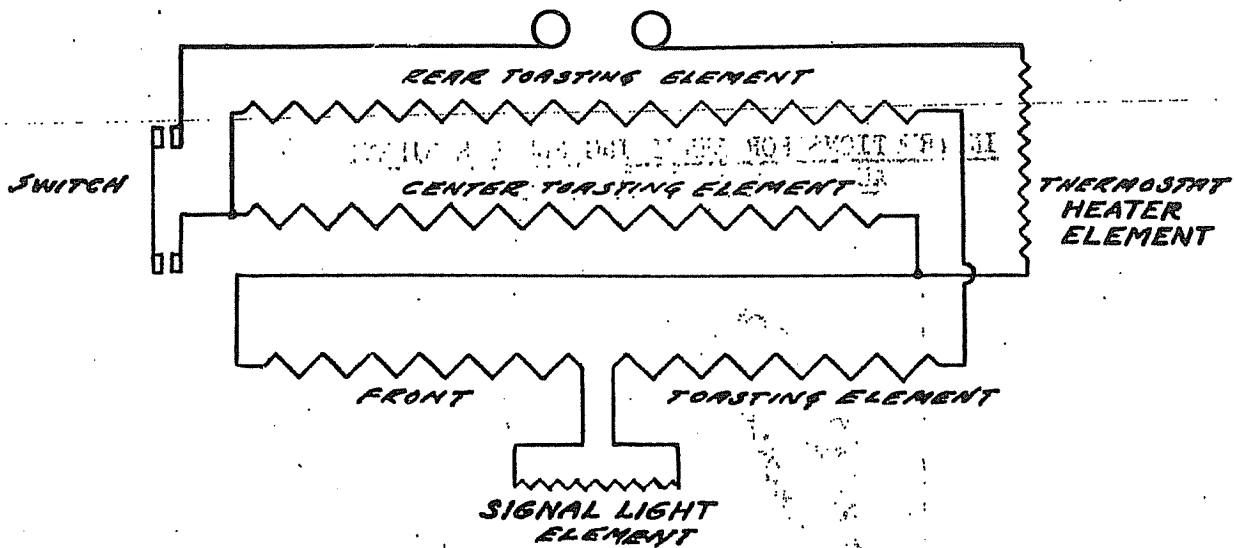
The main thermostat blade (key number 47) is heated by the thermostat heater element (5), the heat is reflected to the thermostat by the reflector (3) and the amount of heat reaching the thermostat blade is regulated by moving this reflector through the cam (13) turned by the thermostat adjustment knob (24). The temperature at which the thermostat snaps off is regulated by the tension of the coiled spring (48) which can be adjusted by turning the nut (49A). The thermostat blade will snap with a "click" against the flat surface of its supporting casting. But before it reaches this surface the thermostat blade hits the end of lever (33) which opens the switch and if the control (24D) is set to "pop-up" the toast rack will move up, coming to a slow stop. The cushioning cylinder (56A) dampens the action of the "pop-up" spring. If the control knob (24D) is in the position marked "Keeps Toast Warm", the movable handle (15) must be raised by hand to remove the toast. The thermostat blade (47) cools rapidly and snaps back into its original position with a second "click" a few seconds after the first, thus re-setting the thermostat. The next toast must not be started until after this second click. The auxiliary thermostat (46) compensates for the temperature rise in the metal parts of the toaster. Without the auxiliary thermostat, the toast would tend to become lighter as successive slices were made.

2. Taking Toaster Apart.

2-A. To remove bottom cover and thermostat bracket assembly (12). Use Tool No. 1 (see list of tools at the end of this bulletin) to remove the four Gulmite screws (60A) near the edges of the thermostat bracket and the crumb tray and bracket (12) may be removed from the plastic base (16). The thermostat bracket should be carefully lifted out, sliding the thermostat blade (47) over the end of the switch locking lever (33). Removing the thermostat bracket (12) permits inspection of the heat adjustment cam (13), the reflector assembly (3) and the thermostat heater element (5).

2-A1. The thermostat blade (47) may be removed from the assembly by first loosening the spanner nut (49A) for tension on adjusting spring (48). Then take off shield (64) from the auxiliary thermostat (46), and remove shoulder screw (44) and its nut (44A). This will relieve pressure of set screw (55) on the main thermostat blade (47) which may now be lifted out from under the thermostat stop (43).

Revised April 8, 1941
 Bulletin No. 24
 Superheater Bureau



The Model 15-20
 toaster is a
 double blade
 toaster with
 a pop-up
 control knob
 and a crumb
 tray.

- 2-B. To remove plastic base (16), remove the four base fastening studs (16A) and two base fastening screws (16B). Remove hexagon nuts (30D) from terminal studs (30). The plastic base and cord can now be lifted off.
- 2-B1. Cord (14) is removed from the molded base by loosening two round-head screws (66) and hexagon nuts (67) holding the two cord clamps (54). Remove the tape from the cord and it may then be turned and carefully twisted out of molded base (16).
- 2-C. To remove body (40, 51, 52). - The three parts of the body are fastened to the bottom mounting plate (11) by eight body mounting screws (41). Before the center section is removed take off the movable handle (15) by loosening its set screw (15A). After lifting off the center section (40), the stationary handle (39) may be removed if necessary. It is held in place by two machine screws (39A).
- 2-D. To remove toast rack assembly (56), remove the four shoulder screws (10A). Remove the switch spring (23) and the ejector extension spring (21). The adjustment nut (21A) and screw (32) for the ejector extension spring may be removed at the same time from the mounting plate. When this is done, carefully raise and pivot the top parallel bars of the rack assembly (56) over the top of the toaster. The rack may now be withdrawn and carefully guided by hand through the openings at the end of the element frame (1). The parallel bars and rack form one complete assembly riveted and spot-welded together and no effort should be made to separate its parts.
- 2-E. Upper and lower shaft assemblies (9 and 10). - The upper shaft assembly (9) and lower shaft assembly (10) may be removed after the four shoulder screws (10A) have been taken out. The upper shaft assembly (9) is pushed to one side and through the extruded opening in the element frame assembly (1). Pivoting on the upper shaft assembly (9) is the ejector lever (35), cushioning cylinder (56A) and roller bracket (34) which are securely held in position by retainer clips. The lower shaft and switch assembly (10) cannot be removed until the switch locking lever (33) is disengaged from the switch arm (36A). To do this, bend back the bearing supports for the locking lever (33) at the bottom of the element frame assembly (1) with a pair of pliers. The locking lever and its torsion spring (33A) may be readily lifted out of place. The lower shaft assembly (10) may now be removed from element frame by pushing the shaft to one side through its bearings in the element frame. The switch assembly (36) and the moving contact points (36B) are part of this assembly (10) and if they are damaged the entire assembly must be replaced.
- 2-F. To remove control knobs (24 and 24D) and cams (13 and 22), remove hexagon nuts (24A), lock washers (24B) and tension washers (24C).
- 2-G. To remove toaster heating element assemblies (6, 7, 8). - All elements used in Model T9 Sunbeam Toasters are graded and matched for resistance value. To obtain uniform toast all of the elements used in a toaster must have the same grade number, 1, 2, 3, 4 or 5, stamped on the upper metal border of the element and this same number must also appear on the thermostat heater element (see Section 2L). Before removing the toasting elements, remove the sixteen guide wires (19 & 20). Lift the wires out of holes with a small hook or bent wire. Do not stretch the wires more than necessary in removing or the springs may lose their tension. Keep the eight longer center guide wires separate from the eight shorter ones to avoid confusion later in reassembling. Remove the element frame top (18) by bending outward with a pair of pliers the

four pairs of ears at the ends so they can be lifted over the lugs on the element frame (1). The insulating spacing washers (59 & 65) may now be lifted out and the elements can be removed by disconnecting bus-bar connections. See wiring diagram on page 1 of this bulletin for bus-bar connections.

- 2-H. The signal light element (57) at the front of the toaster may be replaced after the front cover (52) has been removed. Connections are made by two small terminal screws (69), nuts (71) and washers (70). The nuts (71) can usually be held with the fingers reaching inside the element frame, but if this is impossible the front heating element (6) must be removed and the nuts (71) held with a wrench.
- 2-I. To remove bottom mounting plate assembly (11), twist the four small lugs on the bottom of the element frame with pliers so that they will pass through the slots in this plate.
- 2-J. To remove reflector (3). - The reflector may be removed by filing or cutting one flattened end of the hinge pin (4) and pulling it out. Before reassembling toaster, be sure that the inner surface of the reflector is clean and bright. Dust or burned marks on this reflector will affect the timing of the thermostat by reducing the heat which reaches it.
- 2-K. Stationary switch contact points (2) are riveted to element frame assembly and if they need replacement the frame assembly (1) should be replaced.
- 2-L. To remove thermostat heater element (5), first remove the two terminal screws (73) which connect the element (5) to bus-bars (25 & 26). Mica washers (30A & 5B) should be removed and put aside. The thermostat heating elements (5) are graded and grade number is marked on one supporting bracket, to match grade of toasting elements. When replacing, be sure that the same grade number appears on all heating and toasting elements including this thermostat heater (see Section 2G).
- 2-M. Piston assembly for cushioning cylinder (63). - The piston (63) is fastened to bottom mounting plate (11) with a split washer (68). The piston must not bind at the point where it passes through the plate (11). If the toast rises too rapidly examine the graphite surface of the piston and the interior of the cushioning cylinder (56A) for scratches or signs of wear. Do not put grease or oil on the graphite plunger. If parts are worn, replace them.

3. Assembling Model T9 Toaster

- 3-A. To fit toasting elements (6, 7, 8) into element frame (1), make sure that all elements used have the same grade number stamped on the upper metal border (see Section 2-G). For correct electrical connections, refer to the wiring diagram on page 1 of this bulletin. (When repairing 200 to 250 volt toasters observe bus-bar connections before taking apart. Elements on such toasters are connected in series so that bus-bar connections are not made as indicated below.) Fix elements in place by fastening terminal screws on bus-bar as tightly as possible to prevent loosening in operation of the toaster and poor electrical contact. On 110-120 volt (and 125-130 volt) toasters, bus-bar (26) connects terminal stud (30) to thermostat heating element (5). Bus-bar (25) connects other end of the thermostat heating element to left end of front toasting element and to right end of center toasting element (7). Bus-bar (28) connects right ends of front and rear toasting elements (6 & 8). Bus-bar (27) connects left ends of rear and center toasting elements. Bus-bar (1A) is

permanently riveted to one fixed switch contact point and connects it to left end of center element (7) and fixed bus-bar (1B) connects other switch contact to terminal stud, thus completing the circuit as shown on the wiring diagram.

- 3-B. To fit top for element frame (18), put six porcelain insulators (59) in position on frame (1) and fit top (18) in position by bending ears over lugs on element frame. (See note under Key No. 18 on parts list). Be sure that top is firmly held in correct position.
- 3-C. Guide wires (19 & 20). - The long (19) and short (20) guide wires may be replaced, long ones in the center, by first hooking the lower ends to the openings in small lugs on the bottom of the element frame and then pulling the top loops up with a small hook to engage the openings in the element frame top (18).
- 3-D. Bottom Mounting Plate Assembly (11). Before assembling the bottom mounting plate to the toaster, the adjusting cam for reflector (13) and the ejector cam (22) should be assembled to their respective bearings. The order of assembly for each one is as follows: Control Knob (24), spring tension washer (24C), bearing cam lock washer (24B) and hexagon nut (24A). Then place the bottom mounting plate assembly under the element frame (1) so that the projecting lugs of element frame enter corresponding slots in the mounting plate. Twist the lugs just enough to insure a tight engagement between the element frame and mounting plate.
- 3-E. The reflector (3) for the thermostat heating assembly is mounted on the element frame assembly by inserting reflector pin (4) through the bracket openings and hinge in the back of the reflector. Projection on top of reflector should be outside, not under, reflector spring (31). Flatten end of pin (4) so that it will not fall out. Turn the cam adjustment knob (24), observing whether the reflector moves freely. Movement of the reflector changes the amount of heat being reflected to the thermostat blade (47). For light toast the angle of the reflector is such that a maximum amount of heat is reflected from the thermostat heating element (5) to the thermostat blade (47). This causes the thermostat to snap off sooner.
- 3-F. Ejector Pawl and Ejector Release Pawl (58). - Two pawls are assembled on the same stud in the element frame assembly (1). The lower pawl is operated by the ejector cam (22) which is turned by the control knob (24D). A tension spring (29) fits about the pivoting stud and applies pressure on both pawls. Make certain that this spring fits properly into recesses in the pawls.
- 3-G. Upper and Lower Shaft Assemblies (9 & 10) and Rack Assembly (56). - The upper and lower shafts and the rack assembly (56) should be assembled at the same time. Insert the bread-carrying racks carefully through the lower ends of the slots at the bottom of the element frame (1) from the reflector end of the element frame assembly. The upper parallel bars should be swung over the top of the toaster and sprung apart where necessary to bring them to their approximate location at the ejector end of the toaster. The lower parallel bars are easily located after the rack is in its position in the toasting chamber. The end of the upper shaft assembly (9) is inserted through the openings in the side of the element frame which serve as bearings for the shaft. The ejector lever (35) is placed so that it can engage with the ejector pawl (58). The switch roller assembly is raised so that the bracket engages the rack assembly in the correct manner. The cushioning cylinder (56A) is fitted over the pis-

ton (63) which is attached to the bottom mounting plate (11). When the parts are aligned in the proper manner, insert the shoulder screws (10A) and lock washers (10B) through the upper parallel bars into the upper shaft assembly (9).

The lower shaft assembly (10) is mounted underneath the upper shaft assembly through two extruded holes in the element frame assembly (1). The movable switch contacts (36B) face toward the stationary contact points (2). The lower parallel bars are raised directly opposite the lower shaft ends and the shoulder screws (10A) and lock washers (10B) inserted. When all four shoulder screws are in position, raise and lower the rack assembly (56) to see that it operates freely.

It may be necessary to adjust relation between pawls (58) and upper rack (56) if, when rack is lowered, ejector lever (35) does not move the correct distance to engage in pawl (58). It should never be necessary to file these parts and ejector lever (35) should not be bent. If pawl support is found bent, it may be straightened so that it forms a right angle with element frame. Raise or lower the round rod on which cushioning cylinder is mounted to increase or decrease throw of ejector lever (35) and switch bracket (34). Using long-nose pliers, grasp flat metal of upper rack near point where it is riveted to ends of round rod and twist slightly in direction required to move round rod up or down. Twist each end the same amount to keep rod level. It will be found that a slight upward twist near each end of the rod will increase the throw of lever (35) considerably.

3-H. Switch Spring (23) and Ejector Spring (21). - The switch spring is fitted between the notched projections on switch lever (36) and slot in the element frame (1) directly behind the upper shaft. The ejector spring (21) is fitted between the adjusting screw (32) projecting through a slot in the bottom mounting plate (11) and the top of ejector lever (35). To fit this spring, remove the adjustment nut (21A) from adjusting screw (32) and loop the end of the spring (21) through the screw. Lower this through the slot in the mounting plate and fit adjustment nut (21A). With the end of a small screw driver, raise the other end of the spring to the hole in the ejector lever (35).

3-I. Switch Locking Lever (33). - The switch locking lever (33) may be replaced as follows: Torsion spring (33A) should be fitted about pivoting pin so that the switch lever (33) moves downward inside switch arm (36A). Insert the pivoting pin of the lever into its proper location on the underside of the bottom mounting plate. Bend the lugs with the bearing holes up to normal position to locate the locking lever. When the plastic base (16) has been put on the mounting plate, examine the switch locking lever for clearance with the thermostat blade (47) at the reflector end of the toaster. It is important that the switch locking lever be from 3/64 to 3/32 inch above the top of the casting upon which the thermostat blade is mounted. This is checked after fitting plastic base (16) by inserting gauge T20491-1 in position where thermostat bracket (50) fits. The end of the lever should enter but not pass the step in the gauge. The test should be made with movable handle (15) lowered.

3-J. Cut-Out Rod (17). - When the cut-out rod is in place, check its effect on the switch locking lever (33) by raising and lowering rack assembly (56). As the rack assembly moves upward, the cut-out rod will operate switch locking lever (33) and open the circuit.

3-K. Check of "Pop-Up" Mechanism. - At this stage of assembly check the "pop-up" feature of the toaster. Turn the control knob (24D) to the right (Keeps toast warm) as far as it will go; this action permits torsion spring (29) to move a pawl into engagement with the ejector lever (35), when the toaster rack (56) is lowered. When the toaster rack is raised again to its starting position, the lever remains in engagement with the pawl. When the control knob (24D) is turned to the left (pops toast up) the ejector lever is released by the ejector release pawl, (58). The extension spring (21) which has been placed under tension on first lowering the rack assembly (56), operates on the ejector lever (35) through shaft to raise the rack. During the toasting operation, control is effected from the thermostat through the switch locking lever assembly (33), switch arm (36A), and ejector pawl (58) which controls movement of the ejector lever (35). Be sure that the torsion spring (29) fitting about ejector pawl stud (58) applies tension to both the ejector pawl and ejector release pawl.

To check operation of the toaster when the control knob (24D) is in the "pop-up" position, lay the toaster on its side so as to take the weight off the switch locking lever (33). Lower the rack assembly (56). The switch arm (36A) should engage the switch locking lever (33). Lift the end of the switch locking lever which makes contact with the thermostat. The rack assembly should move up on the release of the switch arm (36A) and ejector lever (35). The movement is dampened by cushioning cylinder and piston (63) and rack should not slap against top of slots in element frame (1).

3-L. Front, Center and Rear Sections of Body (52,40,51). - When assembling the body to the toaster, the front and rear covers should be put on first, taking care that the front section with glass signal disc (52A) is located in front of the signal element (57). Use screws (41) in fastening the bodies to the toaster. The stationary handle (39) is attached to the center section by two screws (39A). The center section (40) may now be slipped into place over the top of the toaster, with the projecting arm for the movable handle through the slot in the center body. The movable handle (15) is attached by set screw (15A) to lever projecting from the side of the toaster.

3-M. Attachment of plastic base (16) and cord (14). - The cord is held in position on the base by two cord clamps (54), screws (66) and nuts (67). The plastic base is fastened to the mounting plate with six screws (16A & 16B). Electrical connections are established at terminal studs (30) by hexagon nuts (30D).

3-N. Bottom Cover and Thermostat Assembly (50). - The bottom cover and thermostat assembly is fastened to the toaster base with four Gulmite screws (60A). It should be carefully guided into position so that the end of locking lever (33) slips under main thermostat blade (47).

3-N1. Adjustment of Thermostat. - The thermostat may be adjusted for correct toasting with the two calibrating weights (Tool No. 2 & No. 3). All thermostat adjustments should be conducted in a room at temperature of 75 to 80 degrees Fahrenheit. The bottom cover and thermostat bracket assembly (50) is placed on a flat table. Be sure that all thermostat parts are at room temperature. Place the rubber bumper of small weight (Tool No. 3 - 1.85 Lbs.) upon the center of thermostat blade (47) directly opposite thermostat stop (43), but be sure that the stop does not interfere. With a finger, depress the thermo-

stat blade to its down position as the smaller weight will be insufficient to cause the blade to snap down. With Tool No. 4, turn set screw for auxiliary thermostat adjustment (55) to the right against the lip on thermostat blade (47). Then carefully balance the smaller weight so that it rests in a perpendicular position on the center of blade. Hold weight by means of sliding collar on rod. Continue to tighten set screw (55) until the thermostat blade (47) acquires just enough tension to force the blade up with the small weight resting in the middle. If the weight should rise without the set screw (55) touching end of main thermostat blade, replace the main thermostat blade (47). This setting may be accurately determined by sliding the collar up and down the rod. The weight plus the friction from the collar sliding down should suffice to keep the blade down, but the weight minus the friction from collar sliding up should allow the thermostat to snap up. A few trials will soon give the operator the proper "feel" for handling weight Tool No. 3.

- 3-N2. After adjusting auxiliary thermostat adjustment screw (55) as explained above, the Tool No. 2 heavier weight (2 lbs) is placed on the rod on top of the smaller weights. Both weights are then placed in the center of main thermostat blade (47) and the tension increased in adjusting spring (48) by turning spanner nut (49A) until the blade just has sufficient tension to support the larger weight when the blade is up in its curved position. Movement of sliding collar up should allow blade to remain up, and movement of collar down should force the blade down. At this point, recheck the auxiliary thermostat adjustment as in paragraph 3-N1 and then check the main thermostat spring again as in this paragraph.
- 3-N3. After adjusting thermostats, make 3 or 4 slices of toast. If dark or light, turn the adjustment nut (49A) for spring (48) in accordance with instructions on the bottom of the casting. If the set screw (55) has been set correctly as outlined in 3-N1, the auxiliary thermostat should require no further adjustment to produce uniform toast.

REPAIRS

4. First establish where repairs are to be made. Check the performance of the toaster as in Section 1. If any or all of the heating elements fail to light, check the electrical circuit as directed in Section 4A below. For other departures from normal operation, check toaster in accordance with instructions given in Section 4-B to 4-G.
- 4-A. If toasting elements do not heat when handle (15) is pulled down (testing electrical connections): - Place toaster upon its side and open the crumb plate (53). On the front side of toaster, examine the connections at the two terminal studs (30), which are protected by terminal insulators (61). To check cord and plug assembly (14), remove insulators (61), place one tip of tester set on one terminal stud and the other tip on one prong of the attachment plug and then the other (any circuit continuity test lamp may be used to make this test). The test lamp should light for one of the connections. Repeat for the other terminal stud (30) and if lamp fails to light for either of the terminals, replace cord set (14). The 3 toasting elements, the signal element and the thermostat heater should also be examined and tested for open circuit by placing the tips of the tester set on the terminals