

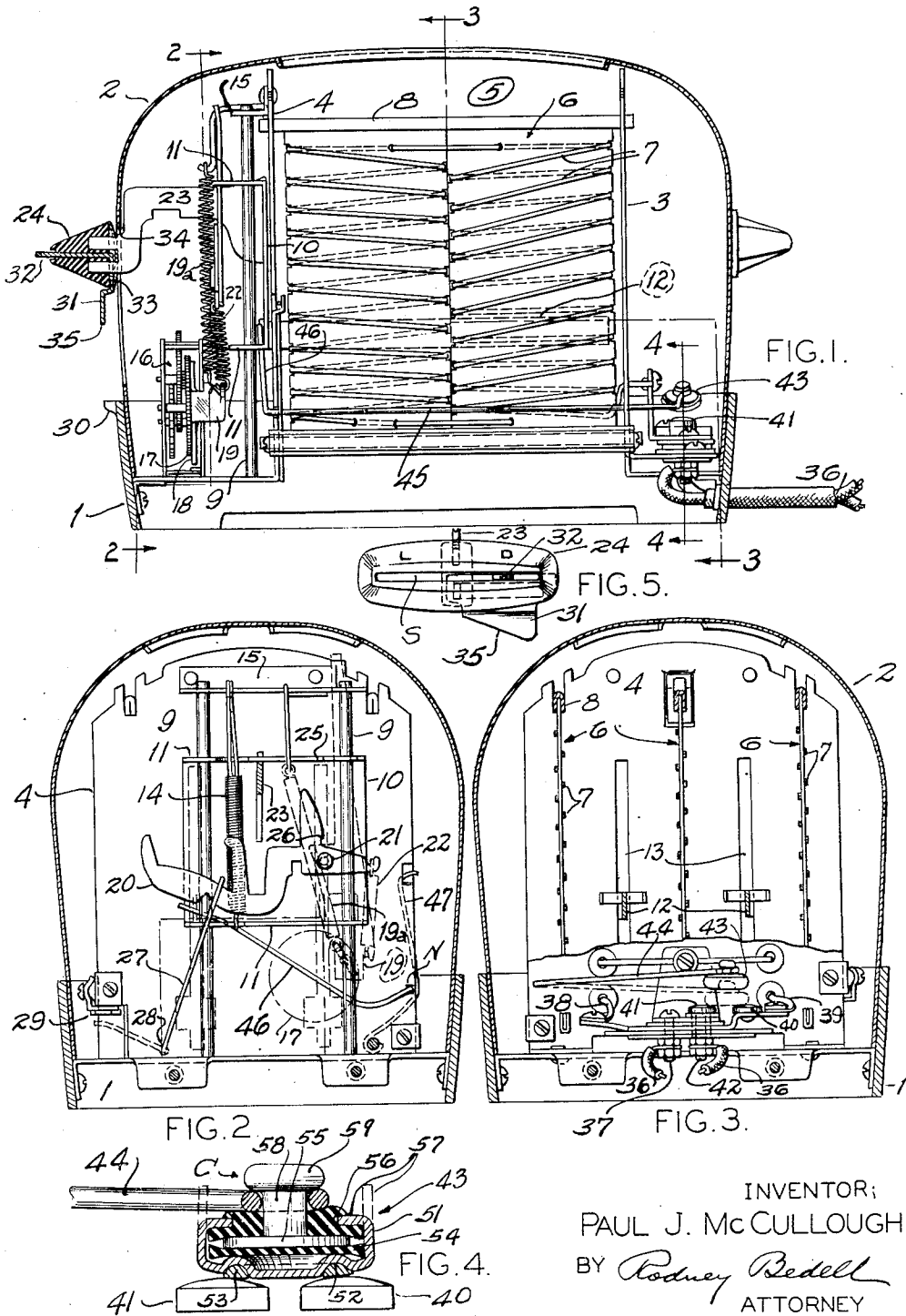
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CONTROL STRUCTURE FOR ELECTRICALLY HEATED DEVICES

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CONTROL STRUCTURE FOR ELECTRICALLY HEATED DEVICES

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3 Claims. (Cl. 219-19)

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The invention relates to apparatus for controlling the operations of electric toasters or other cookers, and more particularly to such apparatus which is set for a heating operation during a predetermined period only and then acts automatically to terminate the heating operation.

One object of the invention is to simplify the construction of the device by segregating the parts for connecting the device to an electric supply current from the parts forming the timing mechanism and the parts for manually setting and regulating the timing mechanism.

An incidental object is to decrease the expense of the construction by avoiding the use of substantial bus bars or corresponding lengths of wiring usually required in like devices for leading the current from the supply circuit connection at one end of the device to the control mechanism at the other end of the device.

Another object is to simplify the control of the device by utilizing a single manually operated member for closing the electric circuit, energizing the timing mechanism and determining the setting of the latter, i. e. the timing period.

These and other detail objects of the invention as will appear below are attained by the structure shown in the accompanying drawings, which structure is intended to be illustrative and not exclusive of other arrangements embodying the general inventive principles. In these drawings—

Figure 1 is a longitudinal vertical section through a domestic bread toaster.

Figures 2 and 3 are vertical transverse sections through the toaster taken on the corresponding section lines of Figure 1.

Figure 4 is a detail section taken on the line 4-4 of Figure 1 and drawn to an enlarged scale.

Figure 5 is a detail elevation of the operating handle and associated control member at the front or left hand end of the toaster.

The toaster body includes a base 1, a housing 2 and end plates 3 and 4 forming the toasting chamber 5. These parts also comprise framing upon which the resistance heaters, the timing mechanism, the switch and other elements are carried. The body base, housing and end plates may be constructed and assembled as illustrated and described in an application, Serial No. 470,191, filed by the present inventor December 26, 1942, now Patent No. 2,404,915, July 30, 1946.

Each of the heating units 6 consists of resistance wires 7 wound upon a sheet of insulation and supported by bars 8 from plates 3 and 4. Three of such units are shown, there being a

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space between the middle unit and each side unit for a slide of bread to be toasted.

End plate 4 mounts spaced uprights 9, and a channel-shaped carriage 10 has apertured flanges 11 slidably along the uprights. Slice supports 12, rigid with carriage 10, extend through slots 13 in plate 4. A tension coil spring 14 has its lower end secured to the lower flange 11 of carriage 10 and has its upper end anchored to a bracket 15 on plate 4. The spring yieldingly supports the carriage 10, and the parts mounted thereon, in the elevated position indicated in Figures 1 and 2.

The timing mechanism unit includes a clock work escapement, indicated generally at 16, which has a main gear 17 driven by a friction disc 18 provided with an arm 19 which carries a latching and trip lever 20 pivoted to the arm at 21 and tilted in a clockwise direction by a tension coil spring 22. A coil spring 19a is anchored to bracket 20 15 and pulls arm 19 upwardly.

A bracket 23, rigid with carriage 10, extends through a slot in the front wall of the housing and mounts a handle 24 by which the carriage may be moved manually from the elevated position shown in Figure 1 to a lowered position in which a lug 25 on the upper flange 11 of carriage 10 will engage a notch 26 on lever 20 to hold carriage 10 and the parts mounted thereon against upward movement by spring 14 except as permitted slowly by clock work escapement 16 and as released by the tripping of lever 20 by a link 27 pivoted at 28 and slotted to receive the tail of lever 20 and limit its upward movement with carriage 10, thereby swinging notch 26 to the left. Link 27 may be controlled by a thermostat 29 to trip lever 20 at different intervals of time dependent upon the temperature to which the thermostat is subjected. This timing mechanism unit in itself does not constitute the present invention but is illustrated, described and claimed in an earlier application filed by the present inventor November 12, 1940, Serial No. 365,255, now Patent No. 2,336,696, December 14, 1943.

Obviously, the period during which carriage 10, and the parts mounted thereon, moves upwardly before lever 20 is tripped by link 27 depends (aside from the thermostatic positioning of link 27) upon the initial downward movement of the carriage by handle 24. This downward movement is limited by the engagement of a stop 30 on body base 1 by a piece 31 slidably along the rear face of handle 24 and having a horizontal finger 32 projecting through a horizontal slot S extending transversely of the handle. A flat spring 33 seated against a shoulder 34 on bracket 23 thrusts

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piece 31 against the rear face of the handle to frictionally retain the piece in its adjusted position transversely of the handle. The lower edge 35 of piece 31 which engages stop 30 forms a cam surface whereby the downward movement of handle 24 will be varied according to the lateral adjustment of piece 31 on the handle.

The toaster is connected to a current supply line by a cord 36 having the usual fitting (not shown) at its outer end for plugging into a suitable outlet. One of the cord wires is secured to a binding post 37 which is connected by a wire 38 to one end of the resistance heating unit consisting of elements 7. The other end of this unit is connected by a wire 39 to a contact 40 adjacent to but spaced from a contact 41 on the other binding post 42 to which the other cord wire is attached.

Contacts 40 and 41 are connected and disconnected electrically by the movement towards and away from them of a disc-like member 43 carried on the outer end of an arm 44 extending transversely of the toaster from a shaft 45 journaled in notches N in plates 3 and 4 and having an arm 46 at the forward end of the toaster extending upwardly through a slot in lower flange 11 on plate 10. A wire spring 47 is anchored to plate 4 at its ends and intermediate its ends bears against shaft 45 to hold the same to its seat in the adjacent notch N.

When handle 24, bracket 23 and plate 10 are moved downwardly they serve as an actuator to energize the timing mechanism, arm 46 being swung downwardly to rotate shaft 45 and to lower arm 44 and disc 43 to close the circuit. Elements 40, 41 and 43 form a switch structure for the heating element circuit. Normally this switch will be closed during the early downward movement of handle 24 and plate 10 and elements 44, 45 and 46 will be formed of spring wire which will be distorted during the further downward movement of plate 10 after disc 43 engages contacts 40 and 41. Hence the shaft and its arms will contribute to the energizing of the timing mechanism. Also the spring structure of elements 44, 45 and 46 accommodates maintenance of a closed switch during most of the upward movement of plate 10 by the springs under the control of the clock work. The circuit will be opened suddenly upon tripping of lever latch 26 and not before.

Member 43 and its mounting on arm 44 are detailed in Figure 4. The member body consists initially of a cup-shaped part 51 having an annular groove 52 receiving a ring 53 of silver or similar high-conductive material. An insulation washer 54 overlies the bottom of cup 51. A collar button-shaped element C has its base 55 seated on insulation 54 and is covered by an insulation washer 56 and is clamped between these washers by the bending inwardly and downwardly of the upper portion 57 of the cup wall. A shank 58 extends upwardly from base 55 and has an enlarged head 59. The end of arm 44 is loosely coiled around shank 58 beneath head 59 and member 43 is free to tilt about an axis extending at right angles to the plane of contacts 40 and 41 and is free to rotate about that axis. Accordingly, when part 43 is moved towards the contacts, it will readily engage the two contacts with equal pressure and the rotation of the part resulting from the jars attending each engagement and disengagement will oppose an infinite number of spots on ring 53 to the contacts so that wear of the contact-engaging portion of part 43 will be negligible.

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With a device constructed as described, the cord connection to the source of current supply is at the rear of the device and the part manipulated by the user is at the front of the device, as is desirable and as is customary in devices of like nature, but the switch in the device itself is also at the rear of the device but is operated by the manually manipulated parts at the front of the device. This provides for the segregation of the switch parts and the timing and setting mechanism, although they are operatively connected, and eliminates a substantial amount of wiring, or bus bars, as is customary to carry the current from the rear of the device to a switch located at the front of the device. The switch is closed and the timing mechanism is energized and the device set for terminating the operation at the end of a predetermined period by the manual manipulation of a single part, namely the handle 24, and the timing period may be varied by an element of this same part, namely the finger 32 which is slidable transversely of the handle. In other words, the user needs to observe but a single restricted part of the toaster.

It will be understood that the features referred to may be embodied in devices other than bread toasters and in detailed structure differing substantially from that illustrated and described without departing from the spirit of the invention, and the exclusive use of modifications coming within the scope of the claims is contemplated.

What is claimed is:

1. In an electric circuit control for an apparatus, a pair of spaced terminals, an element for engaging both of said terminals, a manually operable part spaced a substantial distance from said terminals and slidable from a non-operating position to a selected one of successive operating positions to vary the operation of the apparatus and to close a circuit and slidable from said operating positions to open the circuit, an elongated member journaled near its ends in stationary bearings and having arms extending transversely of its length, one of said arms being secured to said terminal engaging element and the other of said arms being connected to said part, said part rotating said member to engage said element with said terminals when said part reaches the first of said positions and said member yielding upon engagement of said terminals by said element to accommodate further movement of said part to successive positions.

2. In an apparatus including a timing device and an electric circuit switch controlled thereby, a manually operated part slidable from an inoperative point to one of several successive operative positions to energize the timing device for different periods of operation according to the selected position to which the part is moved, and movable from the selected operative position to the inoperative point as the timing device functions, a switch actuator comprising a rod journaled in stationary bearings and having a resilient crank arm at one end connected to and movable by said part to rotate the rod as the part is moved between said point and the first of said positions, an offset arm on the other end of said rod, and a switch member connected thereto adapted to close and open the switch by said movements of said actuator, said actuator yielding independently of movement of the switch to accommodate movement of said part between said first-mentioned position and another of said positions.

3. In a device of the class described, an elec-

trically energized unit having a compartment with substantially spaced ends and substantially spaced sides, a switch opening and closing member near the center of one end of the unit, a manually operated part near the center of the other end of the unit, an elongated U-shaped rod connected at one end to said part and extending therefrom alongside the corresponding end of the unit to one side of the unit, then alongside said side of the unit to the other end of the unit and then alongside of the first-mentioned end of the unit to said switch member, said part being mounted to slide on a stationary mounting in a substantially straight line from a non-operating position to a selected one of several operating positions, a device varying the time said member holds the switch closed according to the operating position of said part, said rod being actuated by said part to move said member to switch closing position as said part is movable to the first of said operating positions and then yielding to accommodate further movement of said part and the end of said rod connected thereto.

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