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R. N. SLATE ET AL
SWITCH CONTROL KNOB

2,701,286

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2 Sheets-Sheet 1

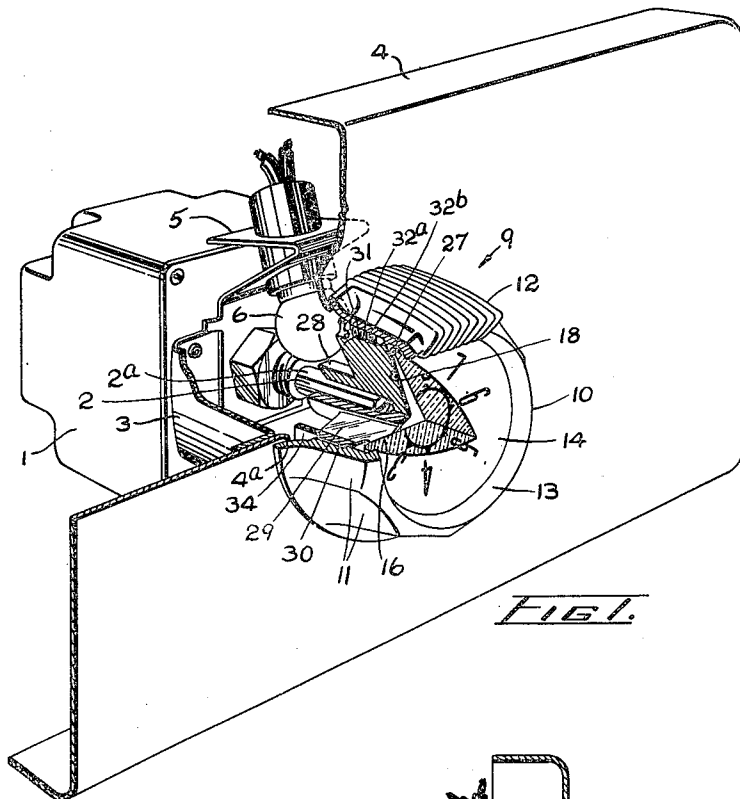


FIG. 1

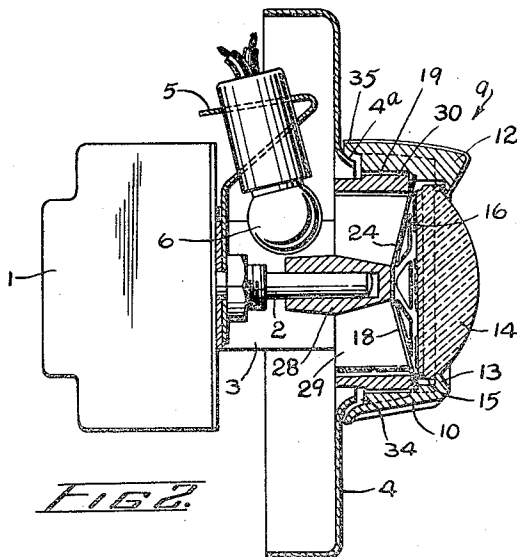


FIG. 2

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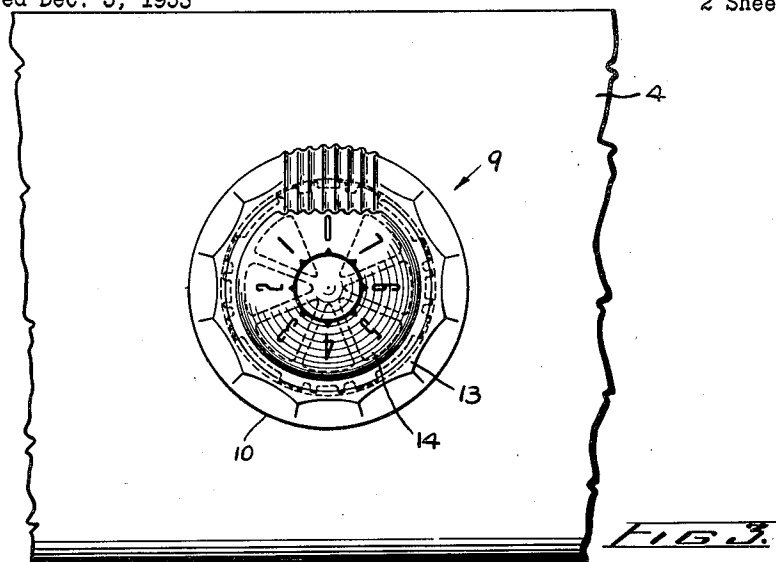
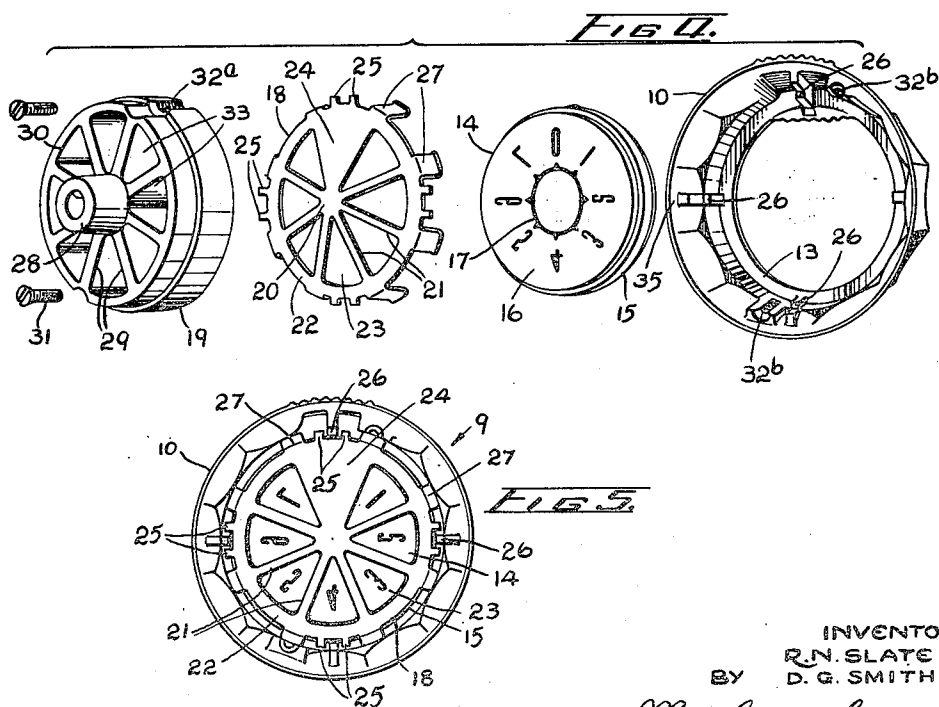
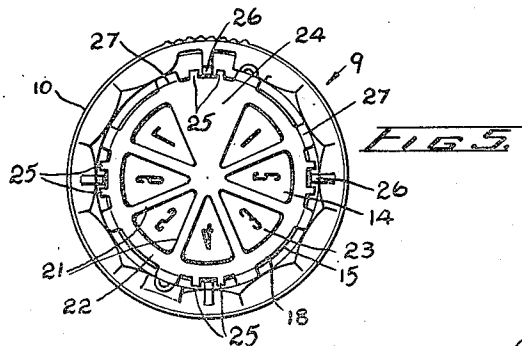
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SWITCH CONTROL KNOB

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10 Claims. (Cl. 200—167)

This invention relates to a rotatable switch positioning control knob.

The object of the invention is to provide an illuminated control knob which will give a clear indication of switch position, and which is attractive, easily fabricated, and durable.

In the accompanying drawings illustrating a preferred embodiment of the invention:

Fig. 1 is a perspective partly sectional view of an illuminated switch control knob mounted on the control panel of an electric stove and coupled to a switch, the switch being in the "off" position;

Fig. 2 is a side view of the switch with the control panel and control knob in section;

Fig. 3 is a front view of the apparatus of Figs. 1 and 2;

Fig. 4 is an exploded perspective view showing rear and side faces of the elements of the control knob; and Fig. 5 is a rear view of the control knob partly assembled.

Projecting from the front of the housing 1 of a conventional rotary switch having an "off" position and seven "on" positions is a split shaft 2 by means of which the switch is rotated from position to position. The switch is supported by a bracket 3 at the rear of a panel 4, and a resilient clip 5 suspends a lamp 6 over the shaft 2.

The shaft 2 projects through a circular opening in the panel 4, the panel having a forwardly directed annular flange 4a around the opening.

The control knob, generally indicated by reference numeral 9, has an outer metallic annular member 10 the outer surface of which is formed with facets 11 providing ornamental finger grips. The member 10 also has a forwardly projecting fluted portion 12 which is uppermost when the switch is in the "off" position. At the front the member 10 has an end opening surrounded by an inwardly directed flange 13, and fitting in the end opening against the flange 13 is a lens-shaped light-transmitting indicator dial 14, the flange 13 co-operating with a flange 15 on the dial to prevent the latter from falling out of the front of the member 10.

The dial 14 is made of transparent material, and painted on its inner surface 16 are eight numerals, from "0" to "7," arranged in a circle to designate the eight positions of the switch. An ornamental ring 17 is also painted on the surface 16. After the numerals and the ornamental ring have been applied to the dial, the surface 16 is coated or frosted so as to be translucent.

Behind the dial 14 is a thin metallic dished spider member 18, and behind that again is a heavier cast spider member 19. The member 18 has a central portion 20 and arms 21 radiating outwardly and forwardly to a circular rim 22. The rim 22 and arms 21 define seven pie-shaped openings 23 in the member 18, and the member 18 also has one opaque sector 24. On the rim 22 are a plurality of tabs 25 arranged in pairs for positioning the member 18 in the annular member 10, the tabs of each pair fitting on opposite sides of positioning lugs 26 in the member 10. The member 18 when properly positioned in the member 10 has its opaque sector 24 directly behind the numeral "0" on the dial, with the openings 23 behind the other numerals. From the rim 22 a plurality of spaced apart resilient fingers 27 extend forwardly to contact the flange 15 on the dial 14; this is normally the only contact between the dial and the spider member 18.

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The spider member 19 has a hub 28 frictionally engaging the split shaft 2, the latter having the usual flattened surface 2a and the hub being of complementary internal configuration so that the shaft and the spider member 19 must rotate together. Radiating from the hub 28 are a plurality of thin, vane-like arms 29 lying in planes radial to the axis of the shaft and having their outer ends connected by an integral rim 30. The member 19 fits into the member 10 with the rim 30 abutting against the lugs 26 and is there secured by split screws 31 which fasten into tapped cylindrical holes formed by semi-cylindrical portions 32a in the rim 30 and matching semi-cylindrical portions 32b in the member 10.

The arms 29, at the front of the member 19, extend forwardly from the hub 28 to the rim 30 so that the front of the member 19 is concave. The dished member 18 fits snugly into the concavity against the member 19, the rim 22 registering with the rim 30, and the arms 21 registering with the arms 29 so as not to obstruct the spaces 33 between the arms 29, save for the obstruction of the forward end of one of these spaces by the sector 24. It will be seen that with the screws 31 tightened the member 18, through its fingers 27, acts as a pressure exerting device on the dial 14 yieldably holding the dial against the flange 13. When the screws 31 are tightened right up, the tips of the fingers 27 contact the flange 13. The resilient member 18 provides automatic compensation for possible variations in the glass or plastic of the dial and also provides the dial with a resilient mounting which minimizes the chance of accidental breakage.

When the switch 1 is in its "off" position, the control knob 9 is in the position shown in the drawings, with the ornamental portion 12 and the numeral "0" on the dial uppermost. The lamp 6 is not energized but the numerals on the dial are visible with ordinary kitchen illumination reflected off the frosted surface 16. When the knob is rotated to bring any of the numerals "1" to "7" uppermost, the switch is in an "on" position and the lamp 6 is energized. Light passing forwardly from the lamp 6 passes primarily through the uppermost space 33 immediately in front of the lamp, the rear edges of the arms 29 being quite close to the lamp and the hub 28 shading the lower spaces 33. To prevent light from escaping around the periphery of the knob 9, the flange 4a is located in a recess 34 formed between the rim 30 and a rearwardly extending rim 35 on the member 10. The member 10 and rim 30 may hereinafter be referred to as the annular portion of the knob 9 and the arms 29 as the spider portion, the spaces 33 forming a transparent central portion of the knob surrounded by the opaque annular portion.

The light passing into the uppermost space 33 is directed by the vane-like arms 29 at either side as a V-shaped beam onto the dial 14, and illuminates a V-shaped area of the dial, said area including one of the numerals "1" to "7." As seen in Fig. 2, the hub 28 tapers conically to its front end and the arms 29 are located on this tapering portion; this construction, together with the lens-shape of the dial 14, results in the V-shaped illuminated area of the dial having the lower tip of the V appearing at the axis of rotation, on which the dial is centered.

Some light reaches the dial through spaces 33 other than the uppermost one, but this light has a relatively large angle of incidence on the translucent surface 16 and is diffused thereby and by the lens-shaped dial to give only a dim general illumination to that part of the dial outside the aforementioned brightly illuminated V-shaped area.

It is to be understood that the form of the invention herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of the parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

What we claim as our invention is:

1. A rotatable switch positioning control knob, comprising an annular portion, a plurality of arms extending inwardly from and fixed relatively to the annular portion, the arms having spaces between them, the annular por-

tion having an open end forwardly of the arms, a light-transmitting member in the open end and in front of the arms, the annular portion having retaining means for preventing the light-transmitting member from falling out of the open end, and resilient pressure means between the light-transmitting member and the arms resiliently urging the light-transmitting member against the retaining means.

2. A rotatable switch positioning control knob, comprising a spider portion having arms and spaces between the arms, an annular portion around the spider portion and fixed relatively thereto, the annular portion having an open end forwardly of the spider portion, a light-transmitting member in the open end and in front of the spider portion, the annular portion having retaining means for preventing the light-transmitting member from falling out of the open end, and resilient pressure means between the light-transmitting member and the spider portion resiliently urging the light-transmitting member against the retaining means.

3. A control knob as claimed in claim 2, in which the spider portion has a switch rotating hub which tapers conically to its front end, and the arms are thin vanes located on the tapering portion of the hub in planes radial to the axis of the hub for directing light in a V-shaped beam onto the light-transmitting member.

4. A control knob as claimed in claim 3, in which the light-transmitting members is lens-shaped.

5. A control knob as claimed in claim 2, in which the pressure means comprises a thin member bearing against the front of the spider portion and having a plurality of spaced apart forwardly extending resilient fingers contacting the light-transmitting member.

6. A control knob as claimed in claim 5, in which the retaining means of the annular portion is a flange, and the fingers have tips contacting the flange.

7. A rotatable switch positioning control knob comprising an annular member having an open end, a light-transmitting member in the open end, the annular member having a flange engaging the light-transmitting member to prevent the light-transmitting member from falling out of the open end, a rigid inner member within the annular member rearwardly of the light-transmitting member, means for tightening the inner member forwardly towards the light-transmitting member, and resilient pressure means between the light-transmitting member and the inner member for preventing fracture of the light-transmitting member.

8. A control knob as claimed in claim 7, in which the inner member has a rim closely adjacent to the annular member, and the tightening means are screws in threaded engagement with and between the rim and the annular member.

9. A rotatable switch positioning control knob, comprising a spider portion having a hub for attachment to a switch, a plurality of arms radiating from the hub and having spaces between them, and a peripheral rim joining the outer ends of the arms, the arms at the front of the spider portion extending forwardly from the hub to the rim so that the front of the spider is concave, an annular member fixed to the rim of the spider portion and having an open end forwardly of the spider portion; a light-transmitting member in the open end and in front of the spider portion, the annular member having retaining means engaging the light-transmitting member near its periphery for preventing the light-transmitting member from falling out of the open end; and pressure means between the light-transmitting member and the spider portion resiliently urging the light-transmitting member against the retaining means, the pressure means comprising a thin metallic dished spider member fitting against the concave front of the spider portion and having arms registering with the arms of the spider portion, a peripheral rim registering with the rim of the spider portion, and a plurality of spaced apart forwardly extending resilient fingers contacting the light-transmitting member along its periphery.

10. In combination, a wall having a circular opening and a forwardly directed annular flange surrounding the opening, a switch position control rotatable about an axis through the centre of the opening, the control having a spider portion with thin vane-like arms disposed in planes radial to the axis, an annular portion surrounding and fixed relatively to the spider portion and located in front of the flange, the annular portion having at its rear an annular recess into which the flange extends, the annular portion also having an open end at its front, a lens-shaped light-transmitting member in the open end and in front of the spider portion, the annular portion having retaining means for preventing the light-transmitting member from falling out of the open end, resilient pressure means between the light-transmitting member and the spider portion resiliently urging the light-transmitting member against the retaining means, and a light source rearward of the spider portion for illuminating the light-transmitting member through the spaces between the arms of the spider portion, the flange in the recess substantially preventing escape of light around the flange, the light-transmitting member having on its surface adjacent the spider portion indicia arranged in front of the spaces between the arms of the spider portion, said surface being translucent and the portion of the light-transmitting member in front of the indicia being transparent.

No references cited.