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RANGE HEAT INDICATOR

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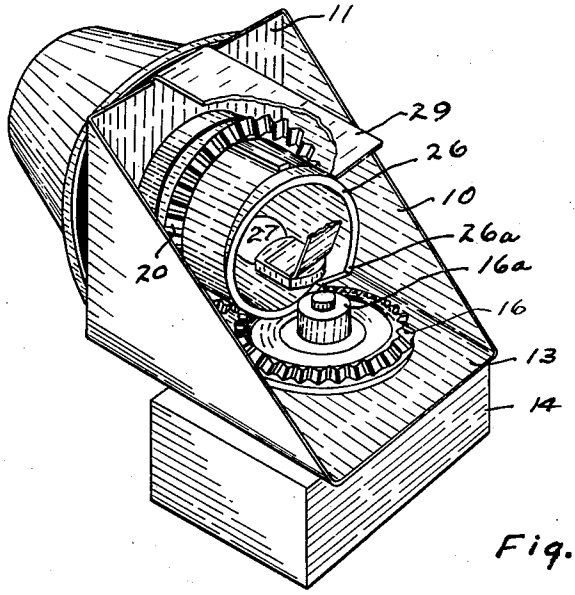


Fig. 1.

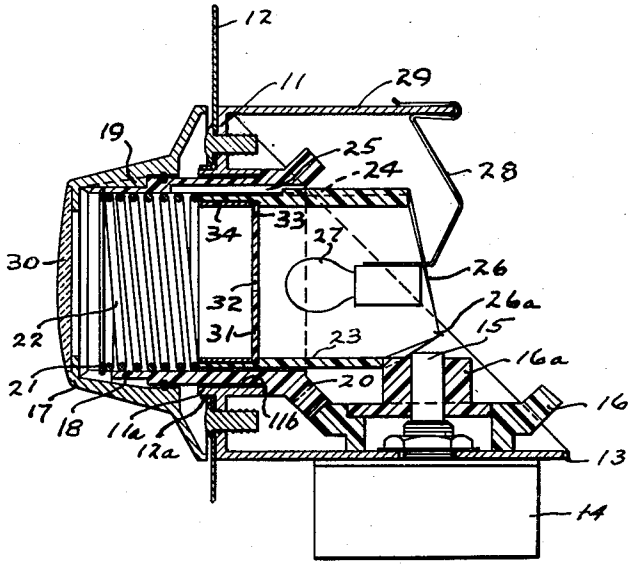


Fig. 2.

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RANGE HEAT INDICATOR

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This invention relates generally to an arrangement for giving a visual indication of the heat setting of a heating unit, and is particularly directed to such an indicator for electrical cooking apparatus, such as an electric range.

Commonly in electrical cooking equipment, such as ranges, fry pans and the like, the heat setting of the cooking element is under the control of a thermostat, which in turn is under the control of a manually operated device, such as a rotatable control knob. While the control knob setting in such equipment usually tells the temperature for which the heating element is set, it is advantageous to provide an auxiliary visual indicator which will more strikingly call to the operator's attention the heat setting of the equipment. The present invention is directed to such a visual indicator.

It is an object of the present invention to provide on a heating apparatus a novel arrangement for visually indicating its heat setting.

It is also an object of this invention to provide on electrical cooking apparatus a novel visual indicator arranged to effectively call to the user's notice the heat setting of the apparatus.

Another object of this invention is to provide a novel visual heat-setting indicator for electrical cooking apparatus which is of simplified and rugged construction which lends itself to economy of manufacture.

Other and further objects and advantages of the present invention will be apparent from the following description of a preferred embodiment thereof applied to an electric range. This preferred embodiment includes a stationary lamp positioned to direct a light beam toward the control knob for the heating unit and a movable plate between the lamp and the control knob which presents an aperture through which the light passes to the control knob. The spacing of this plate from the lamp is determined by the setting of the control knob and the size of the light spot visible on the control knob is correspondingly varied so as to give a high noticeable visual indication of the heat setting.

In the drawings:

Figure 1 is a perspective view, with parts broken away for clarity, showing the present assembly viewed from the back of the control knob; and

Figure 2 is a longitudinal section through the Figure 1 assembly.

Referring to the drawings, a physical support for the heat control and indicator in the present invention is in the form of a sheet metal bracket **10** which has its front wall **11** suitably fastened to the splash-back panel **12** of an electric range. The rearwardly extending bottom wall **13** of the bracket supports the housing **14** of a control, which may be a thermostat or rheostat or any other element which is used to control the circuit that determines the heat output of the heating unit, and which is suitably connected electrically to the heating unit of a top burner on the range. The adjustable portion of the

control is coupled to a rotary stem **15**, which projects through the housing **14** and up beyond the bottom wall **13** of the supporting bracket. A bevel gear **16** is suitably affixed to stem **15**, such that turning of this gear causes the control setting to be changed accordingly.

As shown in Fig. 2, the splash-back panel **12** is formed with a forwardly projecting annular flange **12*a*** which defines a circular opening. The bracket front wall **11** has a forwardly and rearwardly projecting annular flange **11*a*** snugly received in this opening in the splash-back panel and defining a circular opening **11*b***.

A manually rotatable control knob **17** is positioned at the front of the splash-back panel **12**. The control knob is mounted on a tubular outer sleeve **18** by means of internal splines **19** on the control knob received snugly in complementary external grooves on the forward end of sleeve **18**. With this arrangement, the sleeve **18** turns as a unit with control knob **17**. The sleeve **18** extends back through the splash-back panel **12** and the opening **11*b*** in the front wall **11** of the support bracket. At its rear end the sleeve **18** carries an integral bevel gear **20**, which meshes with the bevel gear **16** for the control. Thus, when the control knob **17** is turned to a particular angular position the setting of the control is adjusted accordingly.

Adjacent its front end, which is disposed within the axial opening in control knob **17**, the outer sleeve **18** carries a metal retaining ring **21**. One end of a compression coil spring **22** abuts against this ring. The other end of this spring abuts against the front end of a hollow inner sleeve **23**. Sleeve **23** is keyed to sleeve **18** by means of an integral longitudinal spline **24** on the top of sleeve **23**, which is received in a complementary longitudinal internal groove **25** in sleeve **18**. The back end of sleeve **23** presents a cam surface **26** which is biased by spring **22** into engagement with the cylindrical periphery of the hub **16*a*** of bevel gear **16**.

A lamp bulb **27** is fixedly supported by means of a spring clip **28** mounted on the back end of the upper wall **29** of support bracket **10**. This bulb is positioned to direct a beam of light onto the transparent front panel **30** of the control knob **17**. A shutter arrangement in the form of an opaque plate **31** with a central aperture **32** is provided to control the size of the light beam impinging on the control knob. Plate **31** is secured against an internal transverse annular shoulder **33** on the sleeve **23** by means of a retaining ring **34**. Thus, the plate **31** moves toward or away from the lamp bulb **27** to vary correspondingly the size of the light spot on the control knob as the inner sleeve **23** slides within the outer sleeve **18**.

In the overall operation of the above described arrangement, when the control knob is in its extreme clockwise position (viewed from the front), the high point **26*a*** of the cam surface on sleeve **23** engages the hub **16*a*** of the gear **16**. This positions sleeve **23** at its extreme forward position (against the bias of spring **22**) and the apertured plate **31** is remote from the lamp **27**. This is the "off" position of the control knob, with the control at its zero setting. At this time the lamp **27** is extinguished by means of a suitable limit switch (not shown) operated by the control knob.

If it is desired to go through progressively higher heating temperature settings, the control knob **17** is turned counter-clockwise (viewed from the front), the control stem **15** being turned correspondingly through gears **20** and **16** to set the control to establish the cooking temperature called for by the control knob. At the same time, the progressively declining cam surface **26** on the sleeve **23** rides across the gear hub **16*a*** under the influence of the spring **22**, and the apertured plate **31** carried by

this sleeve moves toward the lamp bulb **27**. With the lamp bulb now illuminated, the size of the light spot impinging on the front of the control knob increases as the plate aperture **32** is positioned progressively closer to the lamp bulb. Thus, the temperature setting to which the control knob is turned determines the size of the light spot visible on the front of knob.

Alternatively, starting from the "off" position the heat control can be turned rapidly to the full "on" setting simply by turning the control knob **17** clockwise, so that the steep declining portion **26***b* of cam surface **26** rides across the hub **16***a*.

Conversely, when it is desired to turn the heating unit off, the control knob may be turned in either direction.

From the foregoing it will be apparent that the present invention provides an extremely effective, notice-catching arrangement for indicating visually the temperature setting of the heating unit.

While in the foregoing description the present invention has been described with reference to an electric range, it is to be understood that it may be used equally well in other types of cooking equipment, such as electric fry pans, electric roasters, gas ranges, and the like.

Also, while there has been described in detail and illustrated in the accompanying drawings a particular preferred embodiment of the present invention, it is to be understood that various modifications, omissions and refinements which depart from the disclosed embodiment may be adopted without departing from the spirit and scope of the present invention.

We claim:

1. In heating apparatus, the combination of adjustable means controlling the heat setting of the apparatus, light source means for producing a light spot visible at the exterior of the apparatus, an apertured member positioned in front of said light source means to control the size of said light spot, and means for adjustably positioning said apertured member toward or away from said light source means in response to the setting of said adjustable means to thereby control the size of said light spot in accordance with the heat setting of the apparatus.

2. In electrical cooking apparatus, the combination of a rheostat for controlling a heating element in said cooking apparatus, a rotatable control knob coupled to said rheostat to determine the setting of the rheostat, a light source positioned behind said control knob to direct a light spot toward the control knob, a plate between the light source and the control knob and having a circular aperture through which the light shines from the light source onto the control knob, and means for adjusting the position of said plate toward and away from the light source in response to the adjustment of the control knob to thereby control the size of the circular light spot on the control knob in accordance with the rheostat setting.

3. In cooking apparatus, the combination of a manually rotatable control knob for controlling the temperature setting of the apparatus, said control knob having a light-transmitting portion, a light source positioned to direct a beam of light toward said light-transmitting portion of the control knob, an apertured member positioned between the light source and said light-transmitting portion of the control knob to control the size of the light spot on said light-transmitting portion of the control knob, and means for positioning said apertured member toward or away from said light source in accordance with the angular position of the control knob to thereby control the size of said light spot in accordance with the temperature setting of the apparatus.

4. In cooking apparatus, the combination of a first bevel gear coupled to the heat control means for the apparatus and presenting a cylindrical hub, a manually rotatable control knob having a light-transmitting portion, an outer sleeve coupled to the control knob to turn therewith and carrying a second bevel gear which meshes with said first bevel gear, an inner sleeve coupled to said outer sleeve to turn therewith and slidable axially within said outer sleeve, said inner sleeve carrying a cam surface remote from the control knob, spring means biasing the inner sleeve to position said cam surface in engagement with the periphery of said hub on the first bevel gear, a lamp bulb fixedly positioned within said inner sleeve to direct a beam of light toward said light-transmitting portion of the control knob, and an opaque plate carried by the inner sleeve and positioned to intercept said beam of light, said plate presenting an aperture which passes light from said bulb to said light-transmitting portion of the control knob to produce a visible light spot on the control knob whose size is determined by the spacing of said opaque plate from the bulb.

5. In cooking apparatus having an adjustable heat control means having a portion with a peripheral surface thereon, the combination of a manually rotatable control knob having a light-transmitting portion and coupled to the heat control means to determine the latter's setting, a sleeve coupled to the control knob to turn therewith and slidable axially toward and away from said light-transmitting portion of the control knob, said sleeve carrying a follower surface remote from said light-transmitting portion of the control knob, spring means biasing the sleeve axially to position said follower surface in engagement with said peripheral surface on the heat control means, one of said surfaces being a cam surface so that rotation of the control knob causes the inner sleeve to be displaced axially toward or away from said light-transmitting portion of the control knob, a lamp fixedly positioned to direct a beam of light toward said light-transmitting portion of the control knob, and an opaque member carried by the inner sleeve to move axially therewith, said opaque member being positioned between said lamp and said light-transmitting portion of the control knob to intercept said beam of light, said opaque member having an aperture which passes light from said lamp to said light-transmitting portion of the control knob to produce a visible light spot on the control knob whose size is determined by the spacing of said opaque member from the lamp.

6. The apparatus of claim 5, wherein said peripheral surface on the heat control means is a cylindrical surface which extends around an axis perpendicular to the axis of said sleeve, and said follower surface on the sleeve is a cam surface which faces away from said light-transmitting portion of the control knob and has tangential engagement with said cylindrical peripheral surface on the heat control means.

7. In cooking apparatus having an adjustable heat control means having a portion with a peripheral surface thereon, the combination of a manually adjustable control member coupled to the heat control means to determine the latter's setting, a light source positioned to produce a beam of light visible at the exterior of the apparatus, an apertured member positioned in front of said light source to control the size of the light spot visible at the exterior of the apparatus, and a follower member carrying said apertured member and slidable toward and away from said light source, said follower member carrying a follower surface which engages said peripheral surface on the heat control means, one of said surfaces being a cam surface so that the adjustment of said control member to adjust the setting of the heat control means also adjusts the apertured member slidably toward or away from said light source to control the size of the light spot visible at the exterior of the apparatus.

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