April 3, 1962 V. G. SHARPE 3,028,208

REFRIGERATOR LIGHTING ARRANGEMENT

Filed May 19, 1960 2 Sheets-Sheet 1

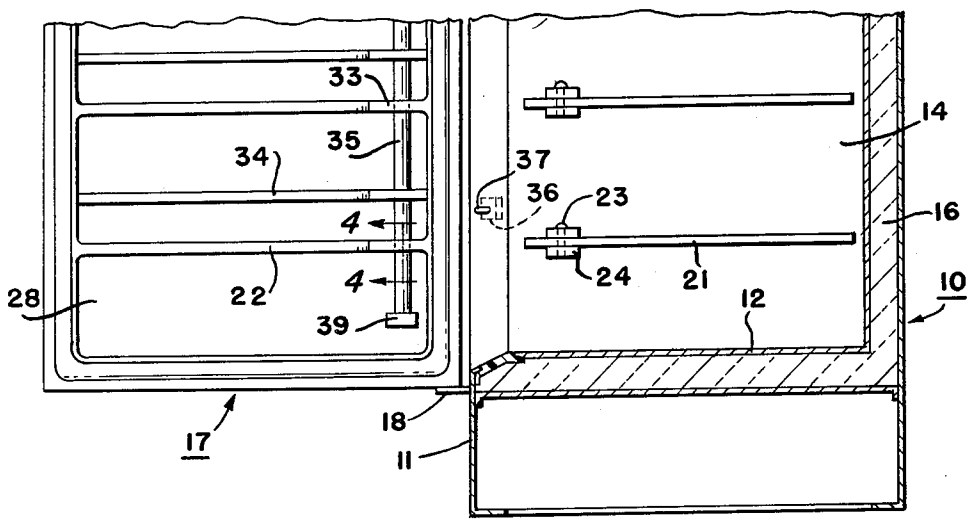


Fig. 3

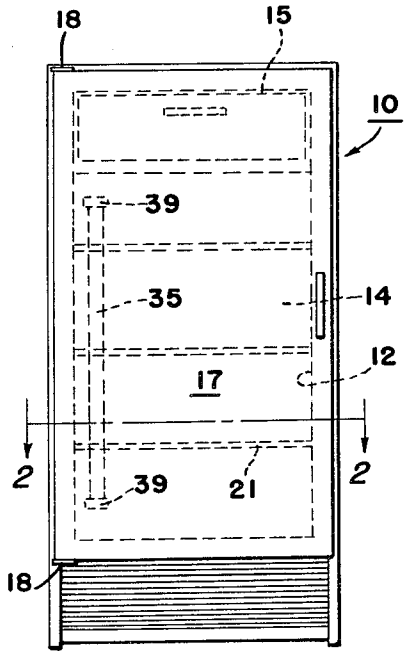


Fig. 1

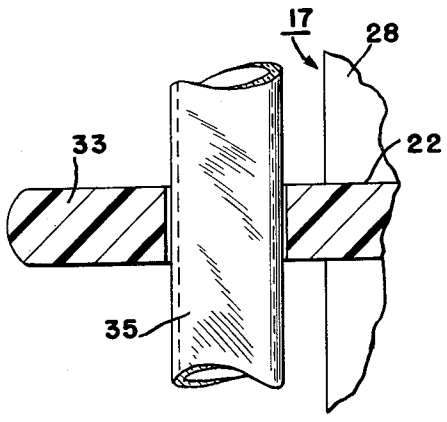


Fig. 4

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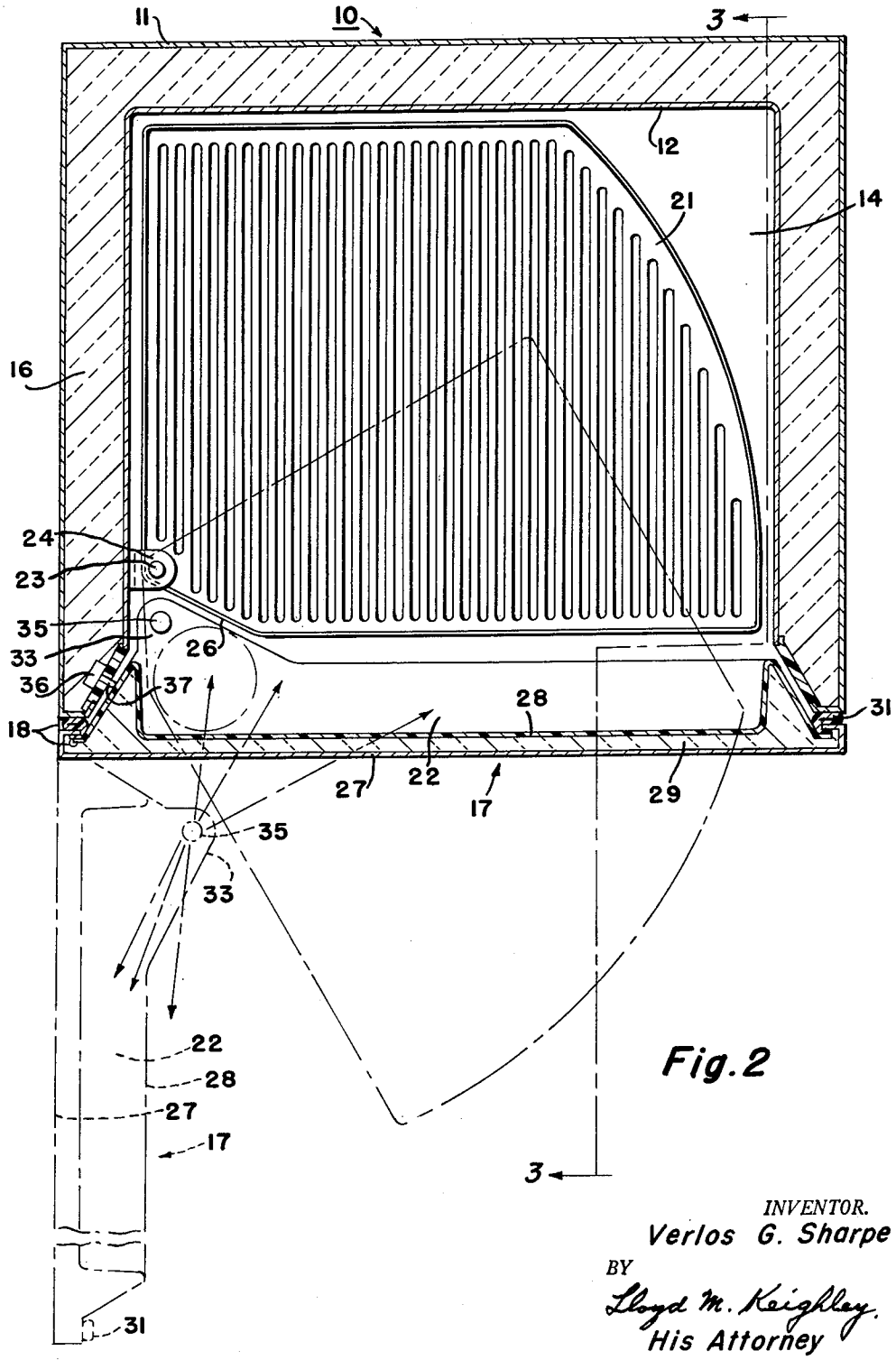


Fig. 2

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REFRIGERATOR LIGHTING ARRANGEMENT

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This invention relates to a lighting arrangement for a cabinet and particularly to illuminating a chamber and a food supporting device associated with the chamber of a household refrigerator.

An object of my invention is to effectively and efficiently illuminate contents of a refrigerator cabinet from a lamp carried by and movable with a horizontally swingable door on the cabinet.

An object of my invention is to provide a unique and improved arrangement for and method of illuminating the interior of a refrigerated food storage chamber of a refrigerator cabinet and a sectional complemental food supporting device associated therewith including a shelf section on and movable with the door outwardly of the chamber.

A further object of my invention is to mount an electric illuminating lamp on an inner part of a refrigerator cabinet door adjacent its hinged side to be movable therewith into a position at the open front of a refrigerated food storage chamber in the cabinet, whereby rays of the lamp will be directed into the chamber and also over the inner face of the opened door.

In carrying out the foregoing objects, it is a still further and more specific object of my invention to illuminate food products stored on various complementary shelf sections of a sectional food supporting device associated with a refrigerated chamber of a refrigerator cabinet wherein one of the shelf sections is mounted on the cabinet door by an elongated electrically energizable lamp carried in a vertical position on an inner part of the door so that rays of the lamp are simultaneously directed in perpendicular directions with respect to the elongation thereof when the door is opened toward the complemental shelf sections in the chamber and over the inner face of the door across other of the complemental shelf sections thereon both above and below the shelf sections of the sectional device.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein preferred embodiment of the present invention is clearly shown.

In the drawings:

FIGURE 1 is a front elevational view of a refrigerator cabinet of a type to which my invention is applicable;

FIGURE 2 is an enlarged horizontal sectional view taken along the line 2—2 of FIGURE 1 showing an electric lamp carried by the refrigerator cabinet door and illustrating in full lines the door closed, and in dot-dash lines the door opened;

FIGURE 3 is a vertical fragmentary sectional view taken along the line 3—3 of FIGURE 2 showing the cabinet door open to illustrate the elongation of the electric lamp and moved sections of a sectional article supporting device associated with the refrigerated chamber of the cabinet; and

FIGURE 4 is an enlarged fragmentary sectional view taken along the line 4—4 of FIGURE 3 showing the lamp bulb extending through an enlarged portion of a shelf section on the refrigerator cabinet door.

Referring to the drawings, I shown in FIGURE 1 thereof a household refrigerator cabinet member 10 having a plurality of insulated walls including an outer metal shell or panels 11 and an inner metal can-like member 12 spaced therefrom (see FIGURE 2) forming a liner of a food storage chamber 14 in the cabinet. Any suitable or desirable insulating material 16 is disposed in the space between liner 12 and outer panels or shell 11. A refrigerating system (not shown) is associated with the refrigerator 10 and this system includes, in addition to a refrigerant translating device or motor-compressor-condenser unit, a refrigerant evaporator connected by suitable pipes or conduits in closed refrigerant flow circuit relationship therewith. Such an evaporator may be of the sheet metal type mounted in the upper portion of chamber 14 behind a cover 15 separate from and inwardly of the refrigerator cabinet door closing an opening in the front of the evaporator, as is conventional in the refrigeration art. The evaporator of the refrigerating system withdraws heat from the interior of chamber 14 and cools and causes circulation of air therein for preserving food products stored in the chamber as is now well known. An electric cable or extension cord ordinarily leads from a suitable wall outlet socket to the electric motor of the refrigerating system for energizing and de-energizing same in response to a control interposed in this circuit and and electric illuminating lamp to be hereinafter described forms a part of that circuit.

Liner 12 has an open front providing chamber 14 with an access opening to the interior thereof. An insulated door member or structure 17 is hingedly mounted at one side thereof upon cabinet member 10 by hinges 18, as is conventional in the art, for horizontal swinging movement relative or with respect to the cabinet member, and this door member normally closes the open front of chamber 14. One or more generally flat sectional article or food supporting devices are disposed within chamber 14 intermediate its top and its bottom and each of these devices compries two complemental shelf sections 21 and 22 mounted in the same horizontal plane with one another and forming complementary parts of a supporting surface occupying substantially all of the cross sectional area of the chamber. The shelf section 21 may be formed of a plurality of secured-together rods or wires, or they may be pressed or stamped from perforated sheets of metal insofar as the present invention is concerned.

It is to be noted that the one shelf section 21 is pivotally mounted in chamber 14 as at 23 on a bracket 24 rigidly secured in the cabinet member so as to be shiftable outwardly of the open front of the chamber when door member 17 is opened. The front corner part adjacent the pivotal mounting of shelf section 21 on cabinet 10 has a cut-out portion 26 and this cut-out is at the side of chamber 14 where door member 17 is hingedly mounted upon the cabinet member. The other or complementary shelf section of the sectional supporting device is provided on door member 17 as will be presently described. Door member or structure 17 includes an outer metal pan 27 and an inner molded plastic panel 28 with any suitable or desirable insulating material 29 disposed

therebetween (see FIGURE 2). A plurality of screws or bolts spaced apart around door 17 secures door pan 27 to door panel 28 along peripheral edges thereof and clamp a portion of a resilient rubber-like gasket 31 therebetween. This gasket is preferably provided with a hollow bulbar part containing a permanent magnet means which is attached to a metal door chamber on the cabinet member 10 to hold the door member shut for closing the open front of chamber 14. The construction and arrangement of gasket 31 may be similar to that disclosed in the co-pending application of Carl F. Petkwitz, Serial No. 833,-166, filed September 12, 1959, and assigned to the assignee of the present application. A magnetic gasket seal of this type is advantageous in that it eliminates the utilization of a door latching mechanism on a refrigerator cabinet. Inner panel 28 of door member or structure 17 is molded into a shape to provide vertically spaced-apart ledges or supports intermediate a recessed portion of this panel and directed away from the inner face of the door, so as to be disposed within chamber 14 when door 17 is closed, and one of which ledges forms the complemental shelf section 22 of each of the sectional supporting devices in the food storage chamber. Each of the ledges or supports on the inner face of door member 17 is provided with a portion 33 enlarged with respect to the remainder thereof adjacent the hinged side of the door. This portion 33 of each shelf section 22, in addition to having an electric lamp within the confine thereof in accordance with my invention, serves other purposes. For example, the enlarged portion 33 of shelf section 22 accommodates or may have supported thereon a larger diametered bottle or jar than can be stored on the remainder of shelf section 22, as shown by the dot-dash lines in FIGURE 2. Also, the inwardly protruding edge part of the enlarged portion 33 of a shelf section 22 will engage the front edge of shelf section 21 when same is shifted about its pivot 23 outwardly of the open front of chamber 14, as shown by the dot-dash lines in FIGURE 2, to return the section 21 into the chamber upon swinging door 17 closed. As door member 17 is swung shut to return shelf section 21 to its proper position within the food storage chamber, as shown by the full lines in FIGURE 2, the enlarged portion 33 of shelf section 22 fits into and substantially fills the space formed by the cut-out portion 26 of shelf section 21 so as to be complemental thereto in providing an article or food supporting surface or device which occupies the major portion of the horizontal cross section of chamber 14. Guard rails or the like 34 spaced above the shelf sections 22 (se FIGURE 3) are secured at their ends to door panel 28 and these rails prevent articles or food products supported on the door shelf sections from being shifted off same during opening and closing movements of door 17.

According to my invention I show in the present disclosure an elongated tubular or bulbar electric lamp, generally represented by the reference numeral 35, carried by and swingable with the door member or structure 17. Since my invention relates to an illuminating lamp and its location, this lamp may be of any suitable or desirable type. For example, it may be an incandescent lamp energized and de-energized by opening and closing swinging movements of door 17 or it may be a fluorescent lamp having necessary elements associated therewith to control its energization by operation of door 17, as is disclosed and described in my copending application, Serial No. 774,216, filed November 17, 1958, now Patent No. 2,953,-909, issued September 27, 1960. For the sake of simplicity, lamp 35 will herein be considered as being of the incandescent character wherein any now well-known or conventional arrangement of extending electric wires from the electric circuit leading to the motor of the motor-compressor unit of the refrigerating system associated with refrigerator 10 out of the cabinet and to the lamp on the cabinet door may be employed. Any suitable electric switch, generally represented by the reference numeral 36, is mounted on the cabinet door jamb and is provided with an actuating button or plunger 37 which is spring biased and projects from the door jamb for engagement by a portion of door 17. Electric wires leading to lamp 35 are connected to switch 36 and this switch controls energization of the lamp in response to opening and closing movements of door 17. Such a switch is also conventional and well known to those skilled in the art and therefore needs no detailed description herein. Lamp 35 is located on an inner part of door member 17 inwardly of cabinet member 10 from the point of engagement of gasket 31 by one of the members and is exposed to the temperature prevailing in food storage chamber 14. The ends of elongated lamp 35 are located or anchored in suitable electric sockets or brackets 39 mounted on a portion of the inner panel 28 of door 17, spaced from the upper and lower shelf or support sections 22. Lamp 35 is located adjacent the hinged side of door 17 and extends vertically along the inner part thereof through suitable openings provided in the spaced-apart shelf sections 22 (see FIGURE 4) so as to project beyond either the upper or lower surfaces of the shelf sections on the door. Thus lamp 35 is located within the confine of enlarged portion 33 of shelf sections 22 and may, if desired, be protected from breakage by any suitable means such, for example, as by a molded plastic shield secured about same. It is preferred that the lamp tube or bulb itself be provided with opposed nontransparent portions coextensive with the elongation of lamp 35 so as to insure emission of light rays from the lamp when door 17 is opened, especially in two opposite directions. In other words, the provision of nontransparent portions on the glass bulb of lamp 35 should be arranged so that substantially concentrated light rays are directed by the lamp, upon opening door 17, in a direction from one side thereof inwardly into food storage chamber 14 and from the other side of the lamp in a direction toward the inner face of the opened cabinet door.

When door member 17 of refrigerator cabinet member 10 is pulled open from its closed position or the full-line position thereof illustrated in FIGURE 2 of the drawings and swung 90° about its pivotal mounted hinges 18 to an open position illustrated by the dot-dash lines, spring biased plunger 37 of switch 36 moves outwardly of the cabinet door jamb and makes contact between electric terminals in the switch for completing or closing the electric circuit to lamp 35, thus energizing same whereby it emits light rays. These light rays are, when door 17 is opened, preferably directed, as hereinbefore explained, in two opposite directions indicated by the arrows in FIGURE 2 into chamber 14 and toward or along the inner face of opened door 17. By virtue of the elongation of lamp 35 and its traversing the sections of the sectional complemental food supporting device the rays of light emitted therefrom are directed in perpendicular directions both above and below each of the shelf sections 21 in chamber 14 and above and below each of the shelf sections 22 on the door. The interior of chamber 14 and the shelf sections therein and door 17 as well as the shelf sections of the complemental sectional food supporting device on the door are in this manner effectively illuminated so that the user of the refrigerator does not have to rely on a kitchen lamp or light to illuminate particularly the inner surface of the opened door which surface may be shielded therefrom by opening of the door. Obviously door 17, when opened, permits either one of the shelf sections 21 of the complemental sectional food supporting device to be swung about its pivotal mounting 23 outwardly beyond the open front or access opening of chamber 14 into the position shown by the dot-dash lines in FIGURE 2 so as to facilitate access to articles or food products supported on the cabinet shelf sections. Since the complemental shelf sections 21 and 22 of the sectional supporting device are disposed in the same horizontal plane, one of the sections 22 will

engage and cam the outswung section 21 when door 17 is closed to return this section to its normal position within chamber 14. As best illustrated in FIGURE 2 of the drawings, lamp 35 is in such position at the hinged side of door member 17 while the door is open as to prevent a person standing in front of the refrigerated chamber 14 of refrigerator cabinet member 10 from obstructing light rays emitted or directed from the lamp in the directions described. In this manner all the contents of refrigerator cabinet 10, and particularly items stored on or supported by the shelf sections 21 and 22 of the supporting device associated with the refrigerated chamber 14 are fully illuminated.

It should be apparent from the foregoing that I have, in addition to mounting a lamp on a door of a refrigerator to be carried thereby for movement therewith to improve the lighting of the cabinet interior, also arranged the lamp on the door in a unique fashion whereby to illuminate shelves thereon or shelf sections of a sectional complemental food supporting device incorporated in the refrigerator construction. By my invention of providing a movable lamp for a refrigerator cabinet I improve the illumination of products stored therein over former or known arrangements wherein light rays of a lamp stationarily mounted in the chamber of a cabinet are frequently blocked or obstructed by food products and prevented from illuminating desired portions of the interior of the chamber. Since articles such as milk, beer or other bottled or canned drinks which are desired to be removed from a refrigerator without disturbing or shifting food products stored in a chamber thereof are ordinarily supported on shelves on the refrigerator door, these articles are effectively illuminated by my unique lamp arrangement at each opening of the door. The employment of an elongated electric lamp and its specified location as herein disclosed has many advantages in the art of illuminating contents of a refrigerator cabinet.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is as follows:

1. In combination, a refrigerator cabinet having a food storage chamber therein provided with an open front, a door hingedly mounted at a side thereof upon said cabinet for horizontal swinging movement with respect thereto normally closing the open front of said chamber, said door having walls providing a recess in its inner face, a generally flat sectional food supporting device within said cabinet intermediate the top and bottom of said chamber, said sectional food supporting device comprising complemental shelf sections one mounted in said chamber and the other mounted on said door within the recess therein for movement with the door relative to said one shelf section, said other shelf section including a portion adjacent the hinged side of said door enlarged with respect to all other portions thereof, said one shelf section having a cut-out portion at the front thereof to receive said enlarged portion of said other shelf section while said door is closed for completing the complementary relationship of the shelf sections of said sectional food supporting device in said chamber, a single electric lamp for illuminating contents of said cabinet, said lamp being carried by and swingable with said door, said lamp being elongated and extending vertically through an aperture provided in said enlarged portion of said other shelf section, said aperture being spaced from the inner face of said door inwardly into said chamber to dispose said lamp beyond walls of the recess in the door within the cut-out portion of said one shelf section, means for controlling energization and de-energization of said lamp in response to opening and closing said door respectively, and the disposition of said single lamp being such that it directs light rays when said door is opened into said chamber and over the door both above and below each of said shelf sections of said sectional complemental food supporting device.

2. The combination defined by claim 1 wherein a part of the one shelf section of the complemental food supporting device is shiftable outwardly of the open front of the chamber while the cabinet door is open and the lamp is energized.

3. In combination, a refrigerator cabinet having a food storage chamber therein provided with an access opening, a door hingedly mounted upon said cabinet at a side of the access opening to said chamber for horizontal swinging movement normally closing the chamber opening, said door including walls providing a recess in the inner face thereof, a generally flat sectional food supporting device within said cabinet intermediate the top and bottom of said chamber, said supporting device comprising complemental shelf sections one mounted in said chamber and the other mounted on said door within the recess therein for movement therewith relative to said one shelf section, said other shelf section including a portion adjacent the hinged side of said door enlarged with respect to the remainder thereof, the front of said one shelf section having a cut-out portion in the neighborhood of the hinged side of the door for receiving said enlarged portion of said other shelf section while said door is closed to complete the complementary relationship of the shelf sections of said sectional food supporting device in said chamber, an electric lamp carried by and swingable with said door, said lamp being elongated and extending vertically through an aperture provided in said enlarged portion of said other shelf section, said aperture being spaced from the inner face of said door inwardly of said chamber to dispose said lamp beyond walls of the recess in the door within the cut-out portion of said one shelf section, means for controlling the energization and deenergization of said lamp in response to opening and closing said door respectively, and the elongation of said lamp together with its proximity to said hinged side of the door cooperating to direct light rays when said door is opened over the inner face thereof both above and below said other shelf section thereon.

4. In combination, a refrigerator cabinet having a food storage chamber therein provided with an access opening, a door hingedly mounted upon said cabinet at a side of the access opening to said chamber for horizontal swinging movement normally closing the chamber opening, said door including walls providing a recess in the inner face thereof, a generally flat sectional food supporting device within said cabinet intermediate the top and bottom of said chamber, said supporting device comprising complemental shelf sections one mounted in said chamber and the other mounted on said door within the recess therein for movement therewith relative to said one shelf section, said other shelf section including a portion adjacent the hinged side of said door enlarged with respect to the remainder thereof, the front of said one shelf section having a cut-out portion in the neighborhood of the hinged side of the door for receiving said enlarged portion of said other shelf section while said door is closed to complete the complementary relationship of the shelf sections of said sectional food supporting device in said chamber, an electric lamp carried by and swingable with said door, said lamp being elongated and extending vertically through an aperture provided in said enlarged portion of said other shelf section, said aperture being spaced from the inner face of said door inwardly of said chamber to dispose said lamp beyond walls of the recess in the door within the cut-out portion of said one shelf section, means for controlling energization and deenergization of said lamp in response to opening and closing said door respectively, the elongation of said lamp together with its proximity to said hinged side of the door cooperating to direct light rays when said door is opened over the inner face thereof both above and below said other shelf section thereon,

said one shelf section of said complemental food supporting device being unattached to the door and pivotally anchored adjacent the cut-out portion thereof to a side of said chamber for swinging movement outwardly of the chamber independently of said door while the door is open, the pivotal anchorage of said one shelf section aligning it at all times vertically with said other shelf section on said door, and the enlarged portion on said other shelf section serving to engage the front edge of said one shelf section when it is swung outwardly of said chamber for camming same back thereinto upon closing said door.

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