United States Patent [19]

Ohlhauser et al.

[11] **3,780,281**

[45] **Dec. 18, 1973**

[54] **DEMOUNTABLE LIGHT FIXTURE FOR BATHROOM CABINET**

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[73] Assignee: **The Celotex Corporation,** Tampa, Fla.

[22] Filed: **Mar. 29, 1972**

[21] Appl. No.: **239,089**

[52] **U.S. Cl.** ..... **240/4.1,** 240/2 W, 240/52.1, 312/223

[51] **Int. Cl.** **F21v 33/00,** A47b 97/00

[58] **Field of Search** ..... 240/2 W, 4.1, 4.2, 240/52 R, 52.1, 106, 149; 312/223

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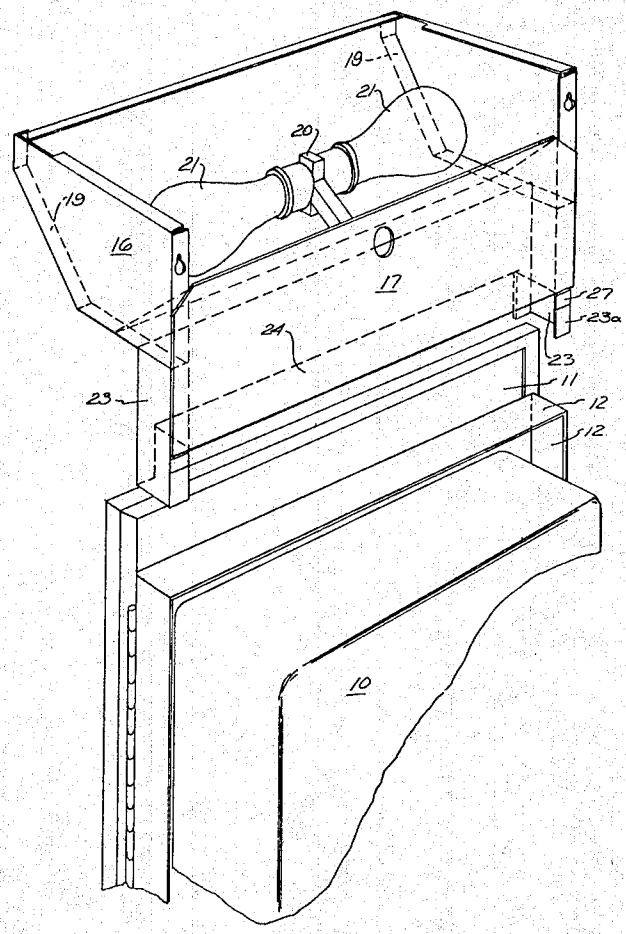
Attorney—John W. Melville et al.

[57] **ABSTRACT**

An attachable-demountable light fixture for a wall cabinet having a swing mirror door, e.g. a bathroom medicine cabinet, as well as a cabinet-light fixture combination, Where the cabinet is reversible, i.e. symmetrical about a horizontal plane, so that it can be mounted with the mirror hinge either on the right or on the left, the light fixture is attachable identically without regard to the orientation of the hinge. The fixture is provided with a sleeve element at each side, telescopingly engageable with the front face frame of the cabinet and automatically interlocked therewith. The fixture comprises a sheet metal encasement for a light source, open at the top, and having a translucent front panel for light diffusion. The translucent panel comprises a portion arranged to diffuse the light downwardly, and a portion arranged to diffuse the light outwardly and downwardly.

5 Claims, 12 Drawing Figures



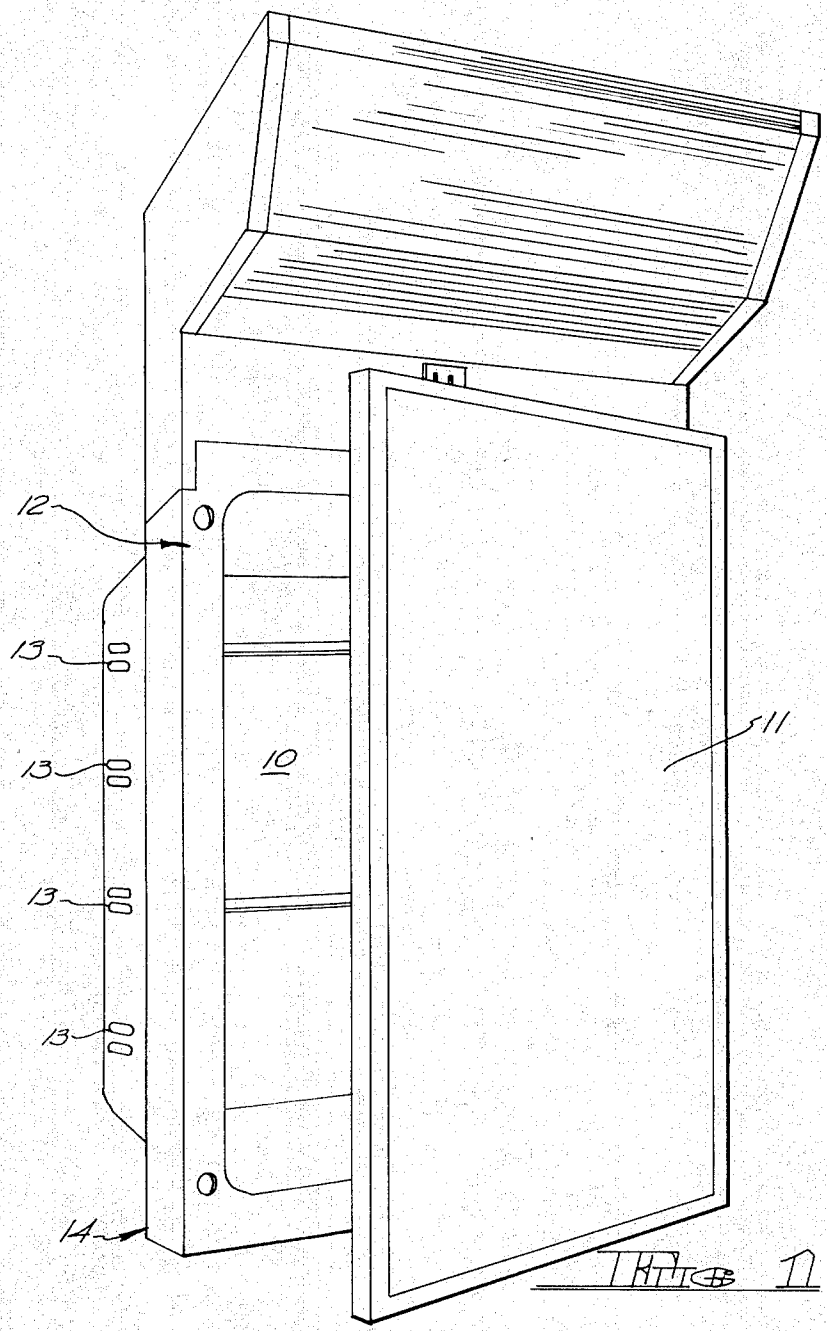


FIG 1

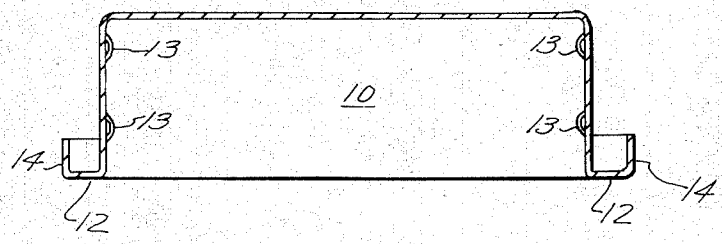


FIG 4

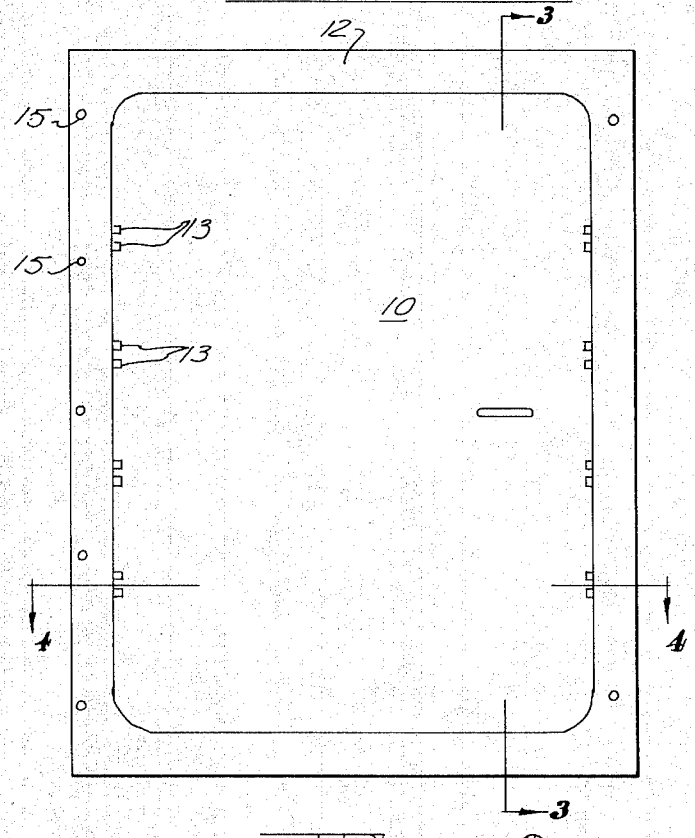


FIG 2

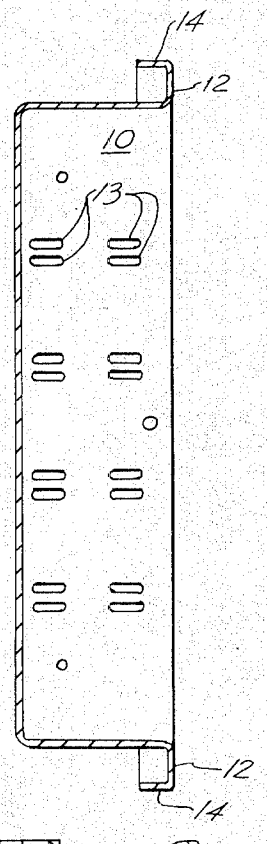


FIG 3

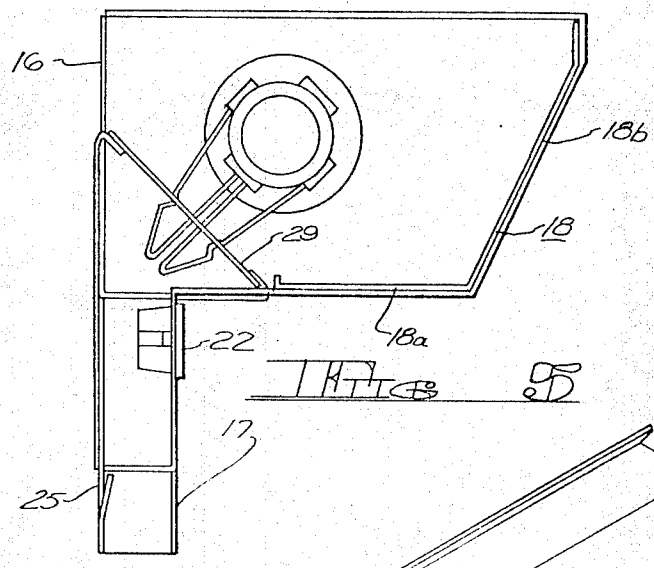


FIG. 5

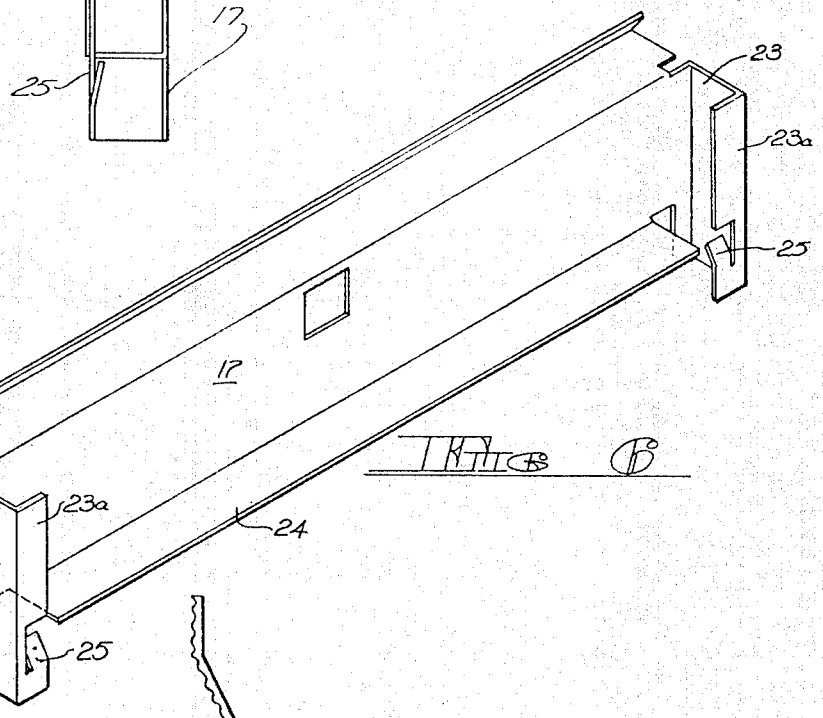


FIG. 6

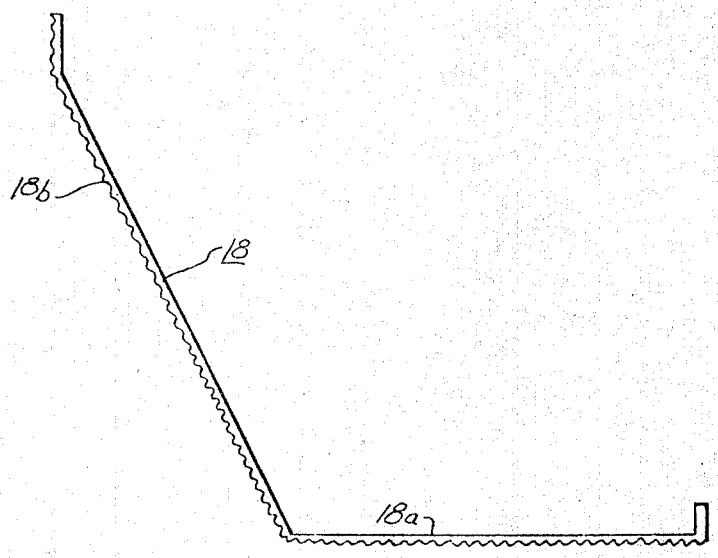


FIG. 7

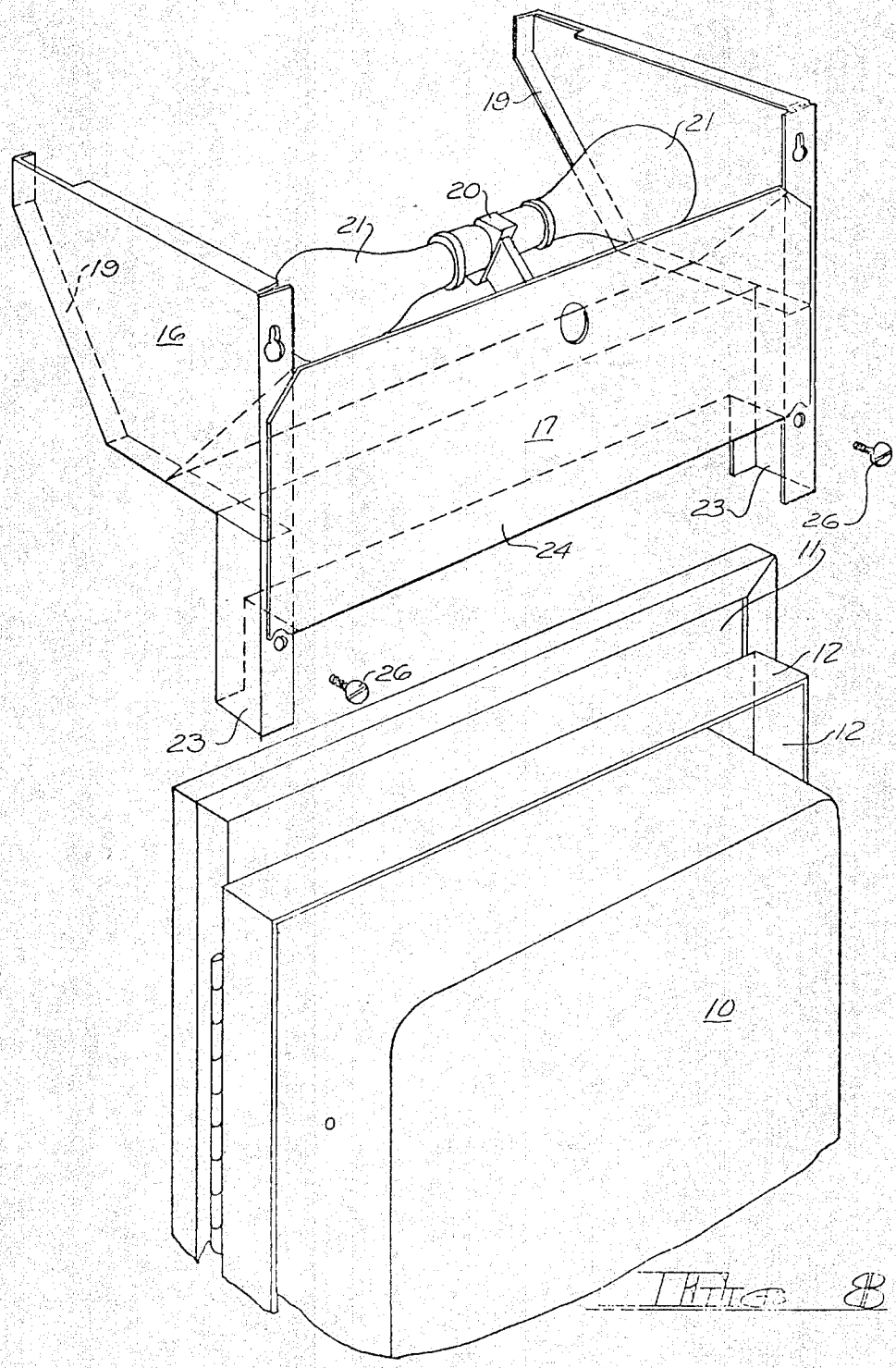


FIG. 8

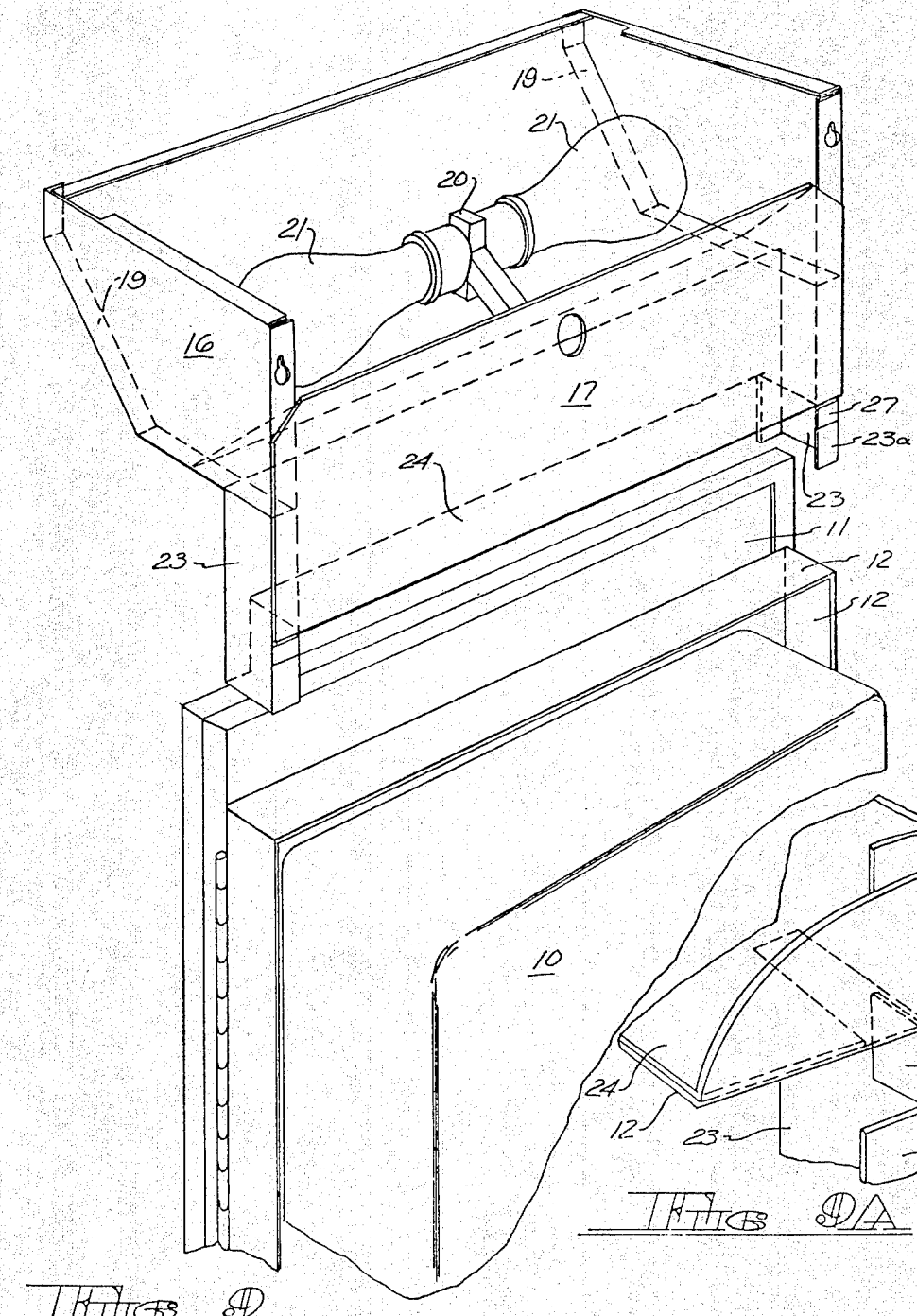


FIG 9

FIG 9A

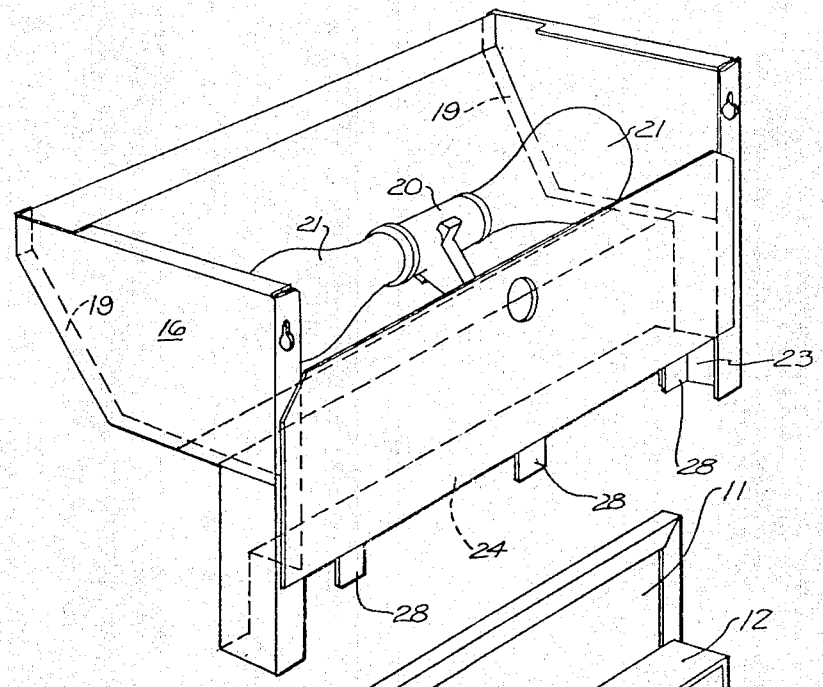


FIG. 10

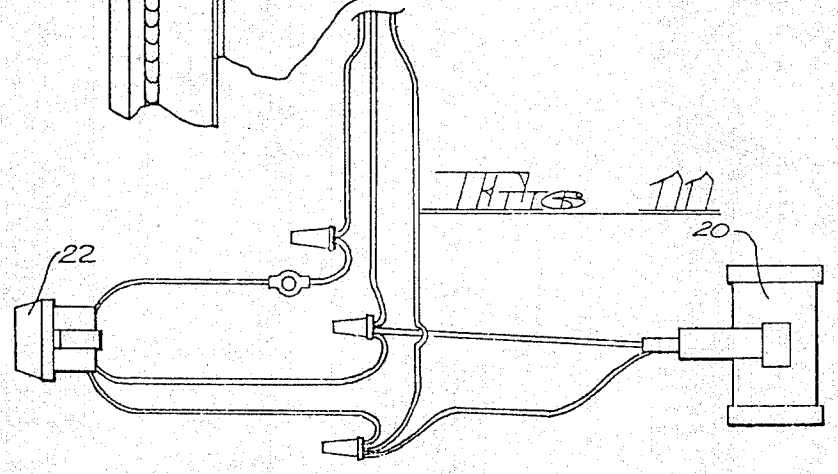


FIG. 11

DEMOUNTABLE LIGHT FIXTURE FOR BATHROOM CABINET

BACKGROUND OF THE INVENTION

Many millions of rectangular wall cabinets with swing mirror doors have been produced and installed in American bathrooms and this type of bathroom cabinet has become quite well standardized in form and dimensions. Specifically, to enable installing a cabinet of the recessed type between wall studs with standard 16 inches spacing, the width of the rough wall opening is usually about 14 inches. A typical specification is 14 inches width, 18 inches height, 3½ inches depth, although the height may vary in some cases. The inside dimensions of a typical cabinet body are: 13¼ inches width, 17¼ inches height, 4¼ inches depth; the front face frame is: 15⅝inches width,19⅝ inches height, frame width 1 3/16 inches and the width of the return flange is 1 inch. The mirror door frame is 16 5/16 inches × 22 5/16 inches.

Some recessed cabinets are produced with larger dimensions and of course surface-mounted cabinets are not restricted as to width by the stud spacing in the wall.

The most serious deficiency of this type of cabinet is that it is unlighted, with no provision for adequate or uniform illumination of the mirror, the lavatory or the person using these facilities. Some lighting is usually provided by installing a single incandescent lamp independently, on the wall above the cabinet, with a translucent glass enclosing shade to direct the light downwardly. Such lighting is invariably inadequate and nonuniform. Slightly better is a fluorescent tube light fixture installed horizontally on the wall above the cabinet. Another expedient is to install a fluorescent light fixture vertically on each side of the cabinet, either attached to the side flanges of the frame or independently mounted on the wall. The cost of these light fixtures and the labor cost for their installation is excessively high and the resulting illumination is still not fully satisfactory.

For the surface-mounted type of cabinet, attempts have been made to obtain improved lighting by placing a light fixture directly on top of the cabinet body, and attached to it. This gives unsatisfactory results because virtually all of the illumination is directed outwardly and little or none toward the mirror and lavatory. Of course, such a cabinet with a permanently attached light fixture cannot be reversible, because inverting the cabinet puts the light fixture at the bottom. Consequently, the reversible cabinet is always produced as an unlighted unit and the problem of providing proper lighting is left unsolved.

BRIEF SUMMARY OF THE INVENTION

This invention embodies a novel, demountable light fixture which can easily be attached to the top of a rectangular wall cabinet, particularly a bathroom cabinet with a mirror door, such as usually is installed above a lavatory. The fixture consists of an upper sheet metal encasement which encloses the light source and this encasement has a translucent front panel to diffuse the light. The lower section of the fixture which supports the light enclosure has a slidable sleeve at each side to engage the front face frame of the cabinet, and each sleeve has, on its rear flange, an interlocking tab to engage and interlock automatically with the return flange

of the cabinet face frame, to secure the light fixture permanently in place when it is installed on top of the cabinet. When thus assembled, the combination of the demountable light fixture with the cabinet provides an integrated top-lighted unit that has many advantages over a wall cabinet with a separate wall-mounted light.

The demountable light fixture is especially advantageous for use with the "reversible" type of cabinet because the fixture is adapted for attachment to either the "top" or "bottom" of the face frame and is placed and attached only after the desired direction of door opening has been determined.

A particularly advantageous use of the demountable light fixture is to provide greatly improved diffused lighting in a bathroom by attaching the fixture to a cabinet which is already installed. This can be done very readily with recessed-type cabinets which are provided with a front face frame having a return flange, on which the horizontal flange of the support frame can rest and to which the interlocking device can be secured.

Careful analysis of the requirements for satisfactory lighting of a bathroom cabinet, mirror and lavatory has indicated that the light fixture should be located substantially above and forward from the mirror face and that the light distribution should be directional from two different planes of the diffuser panel. To achieve the most effective illumination the demountable light fixture of this invention is of special shape and dimensions, is thus located in relation to the mirror front, and is provided with a special angular two-plane diffuser panel for the front face and lower front of the light enclosure. The light diffuser consists of two planes of a rigid, translucent sheet material preformed as an integral panel, with the planes having their axes parallel to the mirror front.

The first plane is adjacent the mirror front, above and spaced from it and is horizontal; the second plane extends upwardly and outwardly from the first plane at an obtuse angle and constitutes the front panel of the light encasement. The combination of these structural features of the light fixture provides directionally dispersed diffuse lighting for the mirror, lavatory, and the person using these facilities, that is greatly improved over any lighting means previously available for this type of wall cabinet.

PURPOSES OF THE INVENTION

The chief purpose of this invention is to provide a reversible, rectangular wall cabinet with a demountable top light fixture that is adapted to be attached to and securely interlocked with either the "top" or the "bottom" of the cabinet body. This enables changing the direction of opening of the swing mirror door from left to right or vice versa at the site of installation, as desired or found necessary for convenient use. If the opening direction is specified in advance, the light fixture may, of course, be permanently installed before shipment. This flexibility of installation avoids the necessity for producing and stocking top lighted cabinets with both right hand and left hand doors.

Another object of the invention is to provide a demountable top light fixture that has attachment sleeves and interlocking devices adaptable for installation of the fixture either on a recess-mounted reversible cabinet or on a surface-mounted reversible cabinet, by making suitable alterations in the dimensions and the

arrangement of the attachment parts of the demountable fixture.

As one preferred embodiment of the invention, a special purpose is to provide a recess-mounted, reversible cabinet with a demountable top light fixture that is surface-mounted and adapted to be attached to and automatically interlocked with the top return flange of the front face frame of the cabinet. This makes it unnecessary to provide a wall opening for the light fixture in addition to the recessed opening for the cabinet body. With the automatic interlocking feature, the installer does not require the use of any tools to combine the cabinet with the light fixture.

A special object of the invention is to provide a demountable top light fixture that may be installed and securely interlocked with a rectangular, recessed-type cabinet that is already in place on the wall. This may be done by simply loosening the attachment screws or bolts holding the cabinet in place, sliding the attachment sleeves of the fixture down over the top flange of the face frame until the fixture automatically interlocks with the return flange, then retightening the screws or bolts. As the fixture is surface-mounted, no cutting into the wall is required for its installation. This enables adding an integrated light fixture to an installed cabinet, to replace the ordinary, inadequate incandescent lamp mounted on the wall above the cabinet, such as has very commonly been used for lighting such cabinets. Thus, the novel demountable fixture can be marketed either as a complete top lighted cabinet, combined with a reversible cabinet body, or as an independent top light unit for installation on a cabinet that is already in service.

Ancillary to the above objects of the invention and affording a significant enhancement of the overall effectiveness of the light fixture is a substantial improvement in the distribution of the illumination provided by it, that results from the structural arrangement of the light enclosure and its location in respect to the cabinet. These factors, combined with the directional dispersion of the diffused light by a preformed, angular, biplanar light diffuser which constitutes the front panel of the light enclosure, are important features of the novel demountable light fixture.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective front view of the complete cabinet, assembled with the demountable top light fixture, showing one side of the cabinet body and with the mirror door partially opened to show the cabinet interior, the front face frame and one of the attachment sleeves of the fixture.

FIG. **2** is a front elevational view of the cabinet body, from its open face, showing on one side the holes in the face frame flange for attachment of the hinged mirror door.

FIG. **3** is a vertical sectional view of the cabinet body taken on the line **3—3** of FIG. **2**, showing the front face frame with the rearwardly-turned flange and the shelf retainer slots.

FIG. **4** is a horizontal sectional view of the cabinet body taken on the line **4—4** of FIG. **2**, showing the front face frame with the return flange.

FIG. **5** is a vertical sectional view of the demountable light fixture, showing the locations of the incandescent lamps and electrical appliance or "convenience" outlet, the sleeve to engage the cabinet front frame, the interlocking tab device for securing the light fixture to the return flange, and the special angular biplanar form of the light diffuser panel.

FIG. **6** is an isometric rear view of the lower part of the light fixture assembly, showing the attachment sleeves at each end, the return flange which rests on the top of the cabinet front frame, and the interlocking tabs at each end.

FIG. **7** is a cross sectional view of the light diffuser panel of FIG. **5**, showing the lower horizontal plane and the front plane projected upwardly at an obtuse angle thereto.

FIG. **8** is an exploded view, from the rear, of the demountable light fixture in relation to the upper part of the cabinet, showing an alternate construction to provide secure attachment of the fixture to the cabinet body.

FIG. **9** and FIG. **10** are views similar to FIG. **8**, illustrating two additional modifications of attachment devices for securing and interlocking the demountable light fixture to the cabinet body.

FIG. **9a** is an enlarged detailed view of the lower right-hand portion of the fixture of FIG. **9**.

FIG. **11** is a schematic wiring diagram for the incandescent lamps and the electrical appliance outlet of the light fixture.

DETAILED DESCRIPTION

In FIG. **1** there is shown a cabinet indicated generally at **10** and which may be a bathroom wall cabinet. The cabinet is of the so-called reversible type in that it is symmetrical about a horizontal plane so that it may be mounted either end up. Thus, a mirror door **11** may be hinged to the cabinet on one side and then the mirror may be a left opening or a right opening mirror, depending upon which way up the cabinet is installed. Such cabinets do not constitute a part of the invention and the cabinets therefore need not be described in great detail.

The front face frame of the cabinet is indicated at **12** and the light fixture according to the present invention is attached to the face frame **12** as will be described in more detail hereinafter. Supporting means for the shelves are indicated generally at **13.** As best seen in FIG. **3** and in FIG. **4** the front face frame **12** has the return flange **14.** In FIG. **2** the mirror has been omitted but the hinge mounting holes **15** are shown.

Referring now to FIGS. **5** to **8** inclusive, the light fixture itself and the manner of its attachment to the cabinet are more clearly shown. The light fixture basically comprises an upper encasement **16** and a supporting member **17.** A diffuser **18** is mounted in the upper encasement and the diffuser is shown separately in FIG. **7.** It will be observed that the diffuser, which is of a white, translucent, medium-impact polystyrene plastic, comprises two plane portions at an angle to each other. The portion **18*a*** is horizontally disposed and diffuses light downwardly, whereas the portion **18*b*** is disposed at an angle and diffuses light downwardly and forwardly. The upper encasement **16** is best seen in perspective in FIG. **8** where it will be observed that it is open at the top and is provided with the flanges **19** which support the diffuser **18.** Within the upper encasement there is mounted the fixture **20** for preferably two incandescent bulbs **21.** An electrical convenience outlet may be provided at **22** (FIG. **5**).

The supporting member **17** has at each end a channel configuration **23** and a bottom return flange **24.** The return flange **23***a* of the channels **23** is provided with a tab **25** which may be bent in as shown in FIG. **6** to lock the supporting member in position.

In assembling the light fixture to the cabinet, reference may be had to FIG. **8.** It will there be seen that the channels **23** are arranged to slide over the front face frame **12** of the cabinet until the return flange **24** rests on the top of the front face frame **12.** When the supporting member **17** is slid into position as above described, the tabs **25** will engage under the flange of the front face frame **12** to lock the fixture in position on the cabinet. If desired, of course, the encasement **16** may be further secured to the wall by means of screws or toggle bolts through holes provided through the rear flange at each end, but this is not necessary.

Referring back to FIGS. **5** and **7,** in the preferred embodiment the lower horizontal plane **18***a* of the diffuser is about 3 inches in width and the front plane is about 4 inches in width and is preferably disposed at an obtuse angle of about 117° with respect to the surface **18***a*. The thickness of the diffuser may be about 0.070 inch and the outer surface of it is preferably ribbed as shown to increase the diffusion of the transmitted light. Some variation in the angle of the two planes **18***a* and **18***b* is permissible; but for effective directional illumination, the angle should generally be from about 105° to about 135° and preferably it should be between about 110° and about 125°. While the diffuser element may be made from white translucent glass, it is preferred that it be made of a light- and heat-stabilized durable plastic such as medium- or high-impact polystyrene. Such a diffuser panel is sufficiently rigid, is easy to install, and is less subject to breakage than glass.

While the construction with regard to the attachment sleeve and interlocking tabs shown in FIGS. **5** and **6** is preferred since it makes possible the securing of the light fixture to the cabinet automatically without the use of tools, it is obvious that other interlocking means may be used and are within the scope of this invention. Three such alternate means are shown in FIGS. **8, 9** and **10.** In FIG. **8** a sheet metal screw **26** may be inserted through the rear flange of the support member at each end beneath the return flange of the face frame **12** to act as a stop and prevent the fixture from being removed. In FIG. **9** an alternative is shown wherein a tab **27** is formed in the rear flange **23***a* of the slidable sleeve at each end of the support member. This flange is then bent over against the adjacent side of the sleeve beneath the return flange **12** of the face frame to provide a secure interlock, as best seen in FIG. **9***a*.

In FIG. **10** a construction is shown wherein three tabs **28** are formed along the lower edge of the rear panel of the fixture which tabs **28** may be bent underneath the return flange **12** of the face frame after the light fixture has been assembled to the cabinet.

In the wiring diagram of FIG. **11,** the twin light socket is indicated at **20** and the "convenience" outlet is indicated at **22.** This type of wiring is conventional in fixtures of this kind.

It will be understood that the fixture of the present invention may be provided separately from the cabinet so that the purchaser can then determine whether he wants a right opening door or a left opening door, and the purchaser can then attach the fixture at either end of the cabinet. The fixture may of course be used with a recessed cabinet or with a surface-mounted cabinet. The fixture may also be sold separately to be attached to a cabinet which is already mounted. If such a cabinet is recessed, it is only necessary to loosen the toggle bolts or screws which secure the cabinet to the wall sufficiently to permit the channels **23** to be telescoped over the front face frame **12** thereof, whereupon the toggle bolts or screws securing the cabinet to the wall may again be tightened.

The fixture shown herein is advantageous in that it provides directional diffuse illumination both downwardly to the mirror and the lavatory (and if the door is open, to the cabinet interior) as well as outwardly and downwardly toward the person using the facility. The fact that the fixture is open at the top makes it easier to clean the diffuser and to replace bulbs and also permits ready heat dissipation from the bulbs. Furthermore it permits some illumination upwardly toward the ceiling which light would be reflected downwardly.

As pointed out above, the demountable light fixture may be installed on a surface-mounted cabinet. In such case, however, the slidable attachment sleeves and the interlocking device must be slightly modified. Usually the surface-mounted type of wall cabinet has a front face frame but it also has a collar which completely encases the inner body so that the return flange of the face frame is not opened for engagement of the interlocking device. It is only necessary to extend the end panels of the fixture encasement and support member to the rear of the cabinet so that the slidable sleeves fit over the front and rear vertical edges of the cabinet body. They may then be interlocked with the cabinet by means of downwardly extending tabs having hook edges which can engage and interlock with mating horizontal slots at the top rear of the cabinet body.

A typical example of the preferred embodiment of the invention employs twenty-three gauge (0.0269 inch) killed cold rolled sheet steel for the cabinet body. Preferably the sheet steel for the light fixture parts is slightly heavier, such as 20 gauge cold rolled steel (0.0344 inch). The light fixture encasement and supporting member are preferably assembled by spot welding the parts to form the structure shown in FIG. **5.** The electrical junction box inside the fixture is provided with a steel cover plate **29** secured with sheet metal screws to protect the wiring. Normally two 60 Watt incandescent lamps are recommended for use in the fixture.

It will be understood that numerous modifications may be made without departing from the spirit of the invention, and therefore no limitation not expressly set forth in the claims is intended or should be implied.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In combination, a rectangular, reversible, wall-recessed cabinet body with a demountable top light fixture, said cabinet body having a front face frame with a rearwardly-turned flange integral with and extending along the entire periphery of said frame and adapted to contact the wall surface and having a hinged mirror door attached to one side of said face frame, said light fixture having an upper encasement including a diffuser panel for the light source and being adapted to be surface-mounted on the wall, and having lower slidable sleeve members having return flanges adapted to engage said front face frame of the cabinet for attachment

thereto and a return flange forming a partition wall for said upper encasement, said light fixture having an interlocking device adapted to secure said light fixture to said cabinet body, said interlocking device comprising at least one inwardly bent tab portion formed on one of said return flanges, said cabinet body being reversible, whereby the direction of said door opening may be reversed by inverting said cabinet and attaching and securing said demountable light fixture to the thus inverted uppermost portion of the face frame.

2. The combination as recited in claim **1**, in which said interlocking device consists of an inwardly bent tab portion formed on the return flange of the slidable sleeve at each side of the fixture attachment member, adapted to engage beneath said rearwardly turned flange of said face frame when said slidable sleeves are pushed downward over the corners of said frame to attach said fixture thereto, and thereby secure said fixture in place on said cabinet.

3. The combination as recited in claim **1** in which said interlocking device adapted to secure said light fixture to said cabinet body comprises an inwardly bent tab portion formed on said partition wall-formin return flange adapted to engage beneath said rearwardly turned flange of said face frame when said light fixture is to be attached to said cabinet.

4. The combination as recited in claim **1** in which said diffuser consists of a preformed panel of rigid, translucent sheet material disposed in two planes with their longitudinal axes parallel to the front of said cabinet, the first of said planes being adjacent said cabinet front and horizontal, to provide diffuse illumination directed downwardly toward said mirror and the horizontal surfaces below said cabinet, the second of said planes extending upwardly and ourwardly from said first plane at an obtuse angle thereto, to provide diffuse illumination directed outwardly and downwardly toward a person viewing himself in said mirror.

5. The combination as recited in claim **4**, wherein said obtuse angle is between about 105° and about 135°.

* * * * *