

Nov. 10, 1970

W. R. GARNETT ET AL

3,539,802

LATCH

Filed May 31, 1968

3 Sheets-Sheet 1

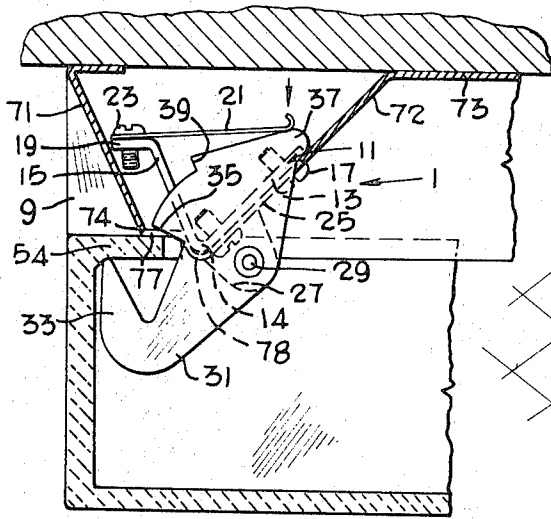


FIG. 2

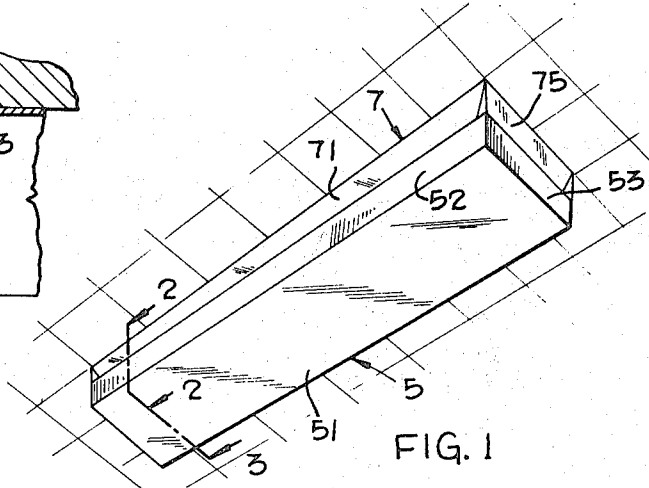


FIG. 1

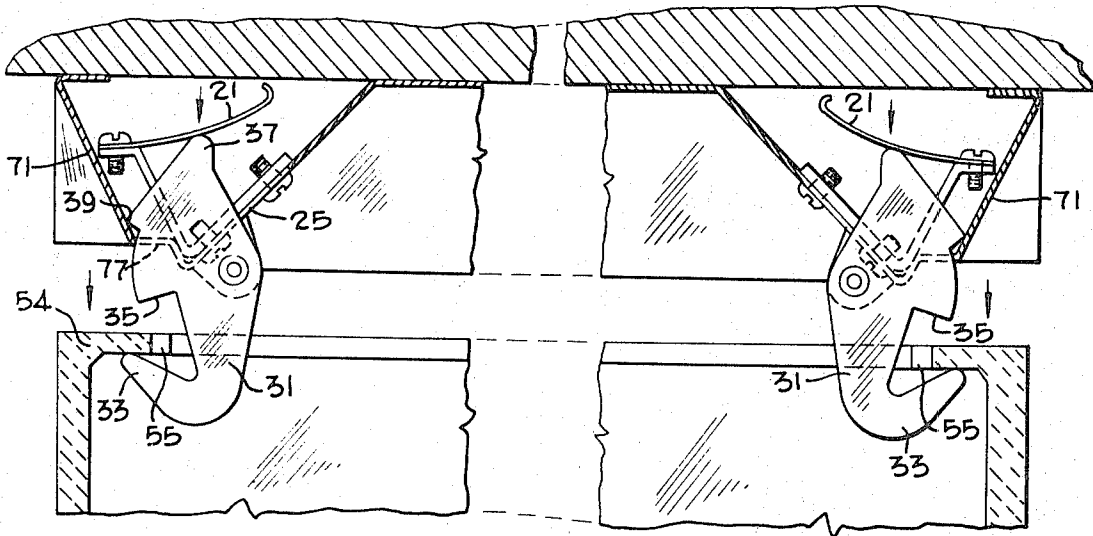


FIG. 3

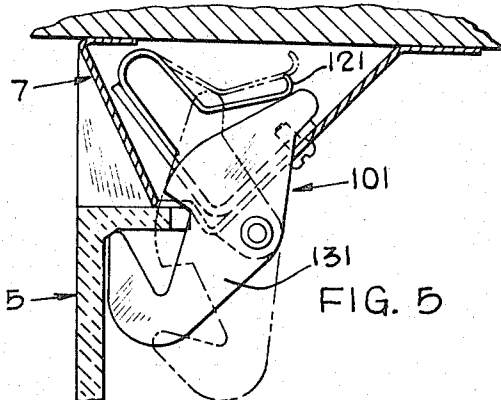
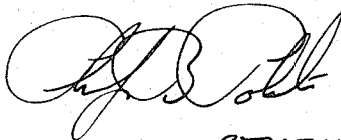


FIG. 5

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3 Sheets-Sheet 2

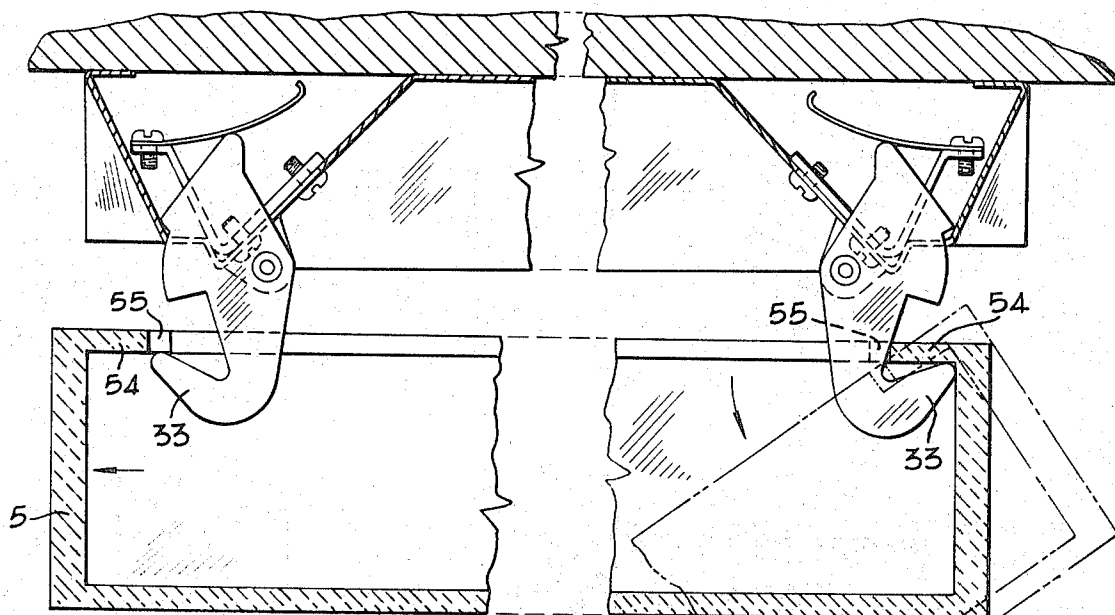


FIG. 4

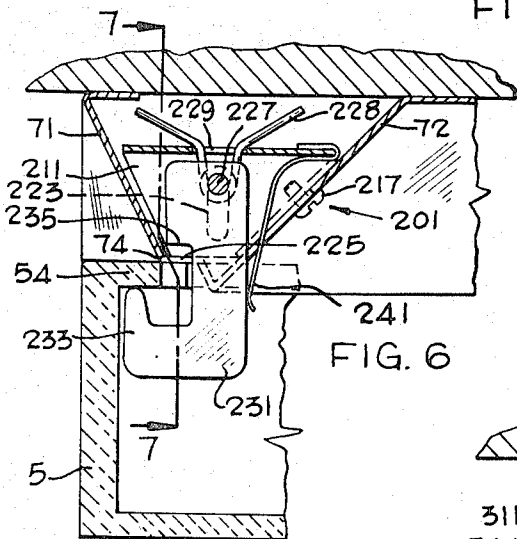


FIG. 6

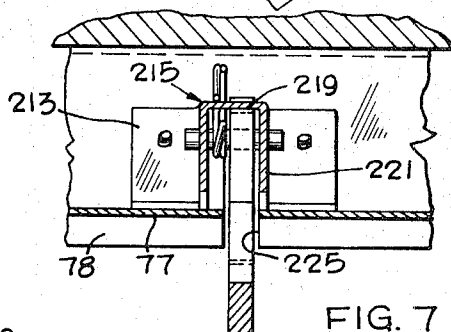


FIG. 7

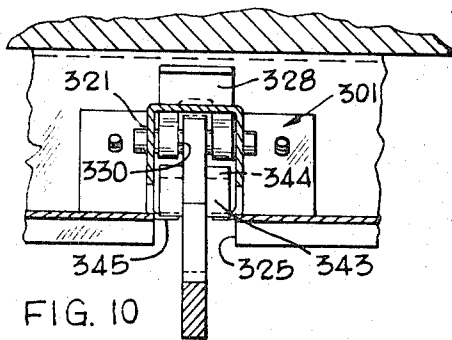


FIG. 10

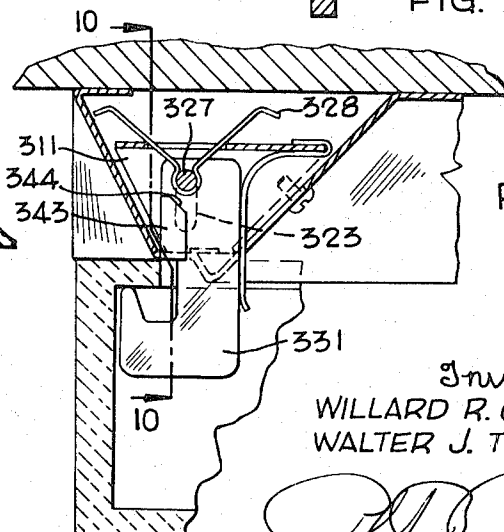


FIG. 9

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Filed May 31, 1968

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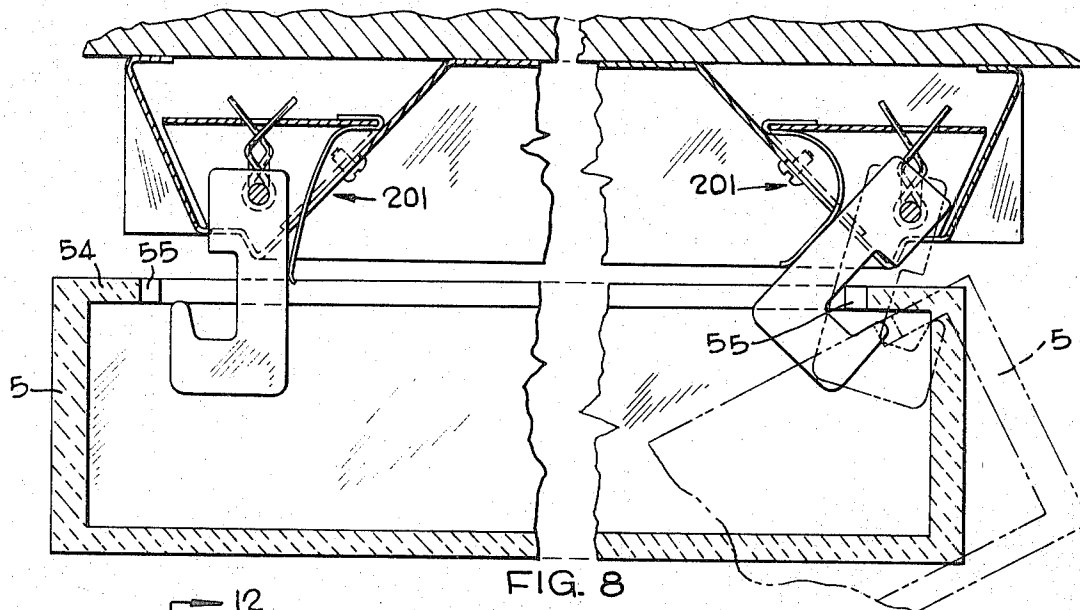


FIG. 8

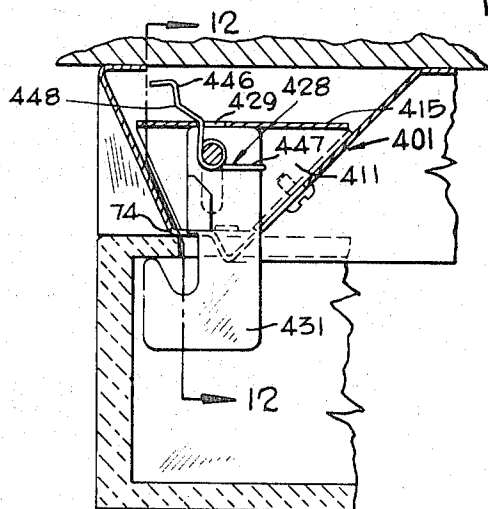


FIG. 11

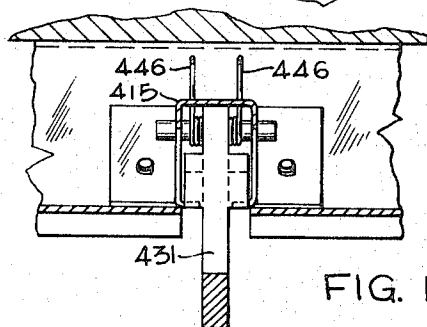


FIG. 12

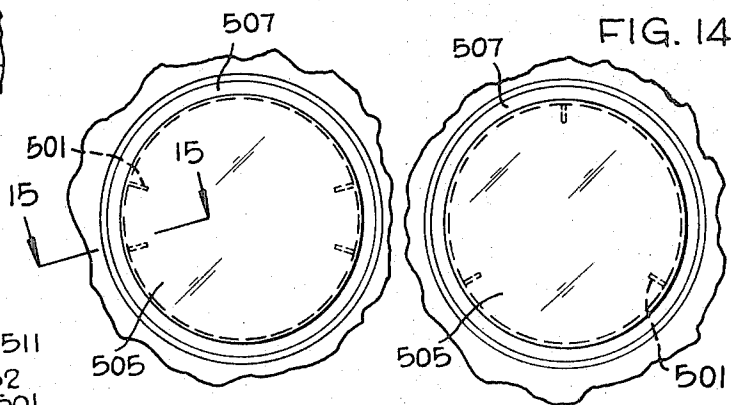


FIG. 13

FIG. 14

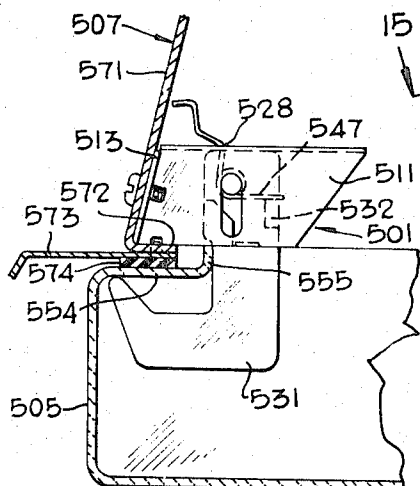


FIG. 15

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Filed May 31, 1968, Ser. No. 733,699

Int. Cl. F21v 17/06

U.S. Cl. 240-128

19 Claims

ABSTRACT OF THE DISCLOSURE

A latch for holding an inturned lip of a lighting enclosure to a lamp housing. The latch is stable in both an open and a closed position. In the closed position a finger on the latch urges the lip against the housing. A set of latches on opposite sides of the enclosure allow the enclosure to be pulled straight down until the latches reach their open position, moved laterally free of one side of the enclosure. Trigger shoulders above the fingers release the latches from their open position when the enclosure is pushed upward against the shoulders.

BACKGROUND OF THE INVENTION

This invention relates to a concealed latch for holding an enclosure to a housing positioned above it. It has particular, but not exclusive, application to holding a light transmitting enclosure to a lamp housing.

Numerous lighting fixtures include a lamp housing which is mounted in, on or from a ceiling structure and a light transmitting enclosure mounted on the housing at its lower, open end. In such fixtures it is highly desirable to provide a completely concealed means for holding the enclosure to the housing. A common method is to provide an inturned lip around at least a part of the upper edge of the enclosure and to provide a clip on the housing to engage the inturned lip. This clip type of latch tends to weaken with use and therefore cannot be relied upon to hold the enclosure tightly against the housing. Furthermore, to obtain a tight fit initially it is necessary that the clips be so stiff that removal of the enclosure is difficult. Because access to the lamps requires complete removal of the enclosure, lamp servicing is awkward and sometimes leads to breakage of the enclosure. Although these drawbacks are cured by hinging one side of the enclosure to the housing, additional framing is required and the hinges are generally visible. Furthermore, the enclosure is no longer easily removable for cleaning or replacing the enclosure or for better access to the lamp housing. Other approaches, such as that disclosed by Florence No. 2,701,299, have been tried, but share some of the disadvantages of the prior methods and have additional disadvantages such as restricting access to the lamp housing, casting objectionable shadows or seriously restricting the design of the housing and enclosure.

One of the objects of this invention is to provide a latch for holding a lighting enclosure to a lamp housing which holds the enclosure tightly against the housing, which allows the enclosure to be lowered simply by pulling downward on it, which allows one side of the enclosure to be swung down without danger of the enclosure's falling, and which allows the enclosure to be removed entirely if desired.

Another object is to provide such a latch which is entirely hidden by the enclosure and which casts virtually no shadows.

Another object is to provide such a latch which operates smoothly and effectively.

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Other objects will occur to those skilled in the art in the light of the following description and accompanying drawings.

SUMMARY OF THE INVENTION

In accordance with this invention, generally stated, a latch for holding an enclosure, having an inturned lip, to a housing above the enclosure is provided, including a bi-stable latch plate with a stable open and a stable closed position. An outboardly extending finger on the latch plate engages the inner surface of the lip of the enclosure and urges the enclosure into abutment with the housing when the latch plate is in its closed position. The latch plate is moved to its open position when the finger is moved downwardly by downward movement of the lip of the enclosure. An outboardly extending trigger shoulder on the latch plate above the finger is engaged by an upper surface of the lip at a stage in the mounting of the enclosure. Upward motion of the trigger shoulder releases the latch plate from its open position.

In the preferred embodiment the latch is mounted to the housing and includes a pivot on which the latch plate is mounted and a spring which bears on the latch plate. The spring biases the finger outboardly around the pivot when the latch plate is in its closed position. Also in the preferred embodiment latches are mounted on two opposite sides of the housing and are the sole support for the enclosure. Also in the preferred embodiment the enclosure and housing are parts of a lighting fixture having a light transmitting enclosure mounted by the latches on a lamp housing. Also in the preferred embodiment the latch plate is made of a light transmitting material.

In some illustrative embodiments the pivot is fixed to the housing and the latch bracket moves from its closed position to its open position by rotation which moves the finger inboardly. The length of inboard travel of the finger is less than the width of the lip on the enclosure, so that when the enclosure is pulled straight down until the latch brackets reach their open position both sides of the enclosure are supported by the fingers. The fingers extend outboardly from the latch plates sufficiently to allow the enclosure to be shifted laterally for releasing the lip on one side of the enclosure from its supporting latch or latches and simultaneously positioning the lip on the opposite side of the enclosure on its supporting latch or latches for hinging motion around the fingers. The spring engages a camming surface on the latch plate above the pivot and alternatively urges the finger outboardly when the latch plate is rotated outboardly to its closed position and inboardly when the latch plate is rotated inboardly to its open position.

In other illustrative embodiments of the latch of this invention the pivot is vertically slidable with respect to the housing from an upper stop position corresponding to the closed position of the latch plate to a lower stop position corresponding to the open position of the latch plate. The spring which biases the finger outboardly when the latch plate is in its closed position continues to bias the finger outboardly when the latch plate is in its open position. However, the latch plate may be rotated inboardly against the bias of the spring for releasing the lip on an opposite side of the enclosure from its finger or fingers. In two of these illustrative embodiments a leaf spring urges the finger outboardly and a second, torsion spring is provided for holding a pivot in an upper and a lower stop position. In a third of these illustrative embodiments a single spring is used for holding the pivot pin in an upper stop position and a lower stop position and for urging the finger outboardly.

In some applications a tight fit between the enclosure and the housing is desirable, whereas in other applications

ventilation of the lamps in the housing is needed and air gaps between the housing and enclosure are desirable. In the former case a gasket is often interposed between the enclosure and the housing, and in the latter case spacers are often interposed. It is to be understood, therefore, that such terms as "against" and "into abutment with," when used to describe the relation of the enclosure to the housing, include an arrangement in which a piece is interposed between the enclosure and housing.

BRIEF DESCRIPTION OF THE DRAWING

In the drawings, FIG. 1 is a view in perspective of a lighting fixture having a light transmitting enclosure held to a lamp housing by latches of this invention;

FIG. 2 is a sectional view taken along the line 2—2 of FIG. 1;

FIG. 3 is a sectional view taken along the line 2—2—3 of FIG. 1, showing a pair of latches in a stable open position;

FIG. 4 is a sectional view corresponding to FIG. 3, illustrating the method of removing the enclosure from one of the latches;

FIG. 5 is a sectional view corresponding to FIG. 2 of a second illustrative embodiment of latch of this invention;

FIG. 6 is a sectional view corresponding to FIG. 2 of another illustrative embodiment of latch of this invention;

FIG. 7 is a sectional view taken along the line 7—7 of FIG. 6;

FIG. 8 is a sectional view, corresponding to FIG. 4, of the embodiment of latch shown in FIGS. 6 and 7, illustrating the method of removing the enclosure;

FIG. 9 is a sectional view corresponding to FIG. 2 of another illustrative embodiment of latch;

FIG. 10 is a sectional view taken along the line 10—10 of FIG. 9;

FIG. 11 is a sectional view corresponding to FIG. 2 of another illustrative embodiment of latch;

FIG. 12 is a sectional view taken along the line 12—12 of FIGURE 11;

FIG. 13 is a diagrammatic bottom plan view of a different form of lighting fixture from that shown in FIGS. 1—12, showing placement of latches of this invention;

FIG. 14 is a diagrammatic bottom plan view of the lighting fixture shown in FIG. 13, showing another placement of latches of this invention; and

FIG. 15 is a sectional view taken along the line 15—15 of FIG. 13.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, and in particular to FIGS. 1—4, reference numeral 1 indicates one illustrative embodiment of latch of this invention. Four latches 1 placed near the four corners of a sheet metal lamp housing 7 hold a light transmitting enclosure 5 to the lamp housing 7.

The enclosure 5 is made of light transmitting material, preferably plastic, is rectangular and has a prismatic bottom wall 51, side walls 52, end walls 53 and an intumed lip 54 which extends around the entire periphery of the enclosure. Preferably the entire enclosure 5 is molded in one piece.

The housing 7 has side bounding wall 71 integral with reflector walls 72 and a top wall 73. End bounding walls 75 are integral with end reflector walls, not shown, which complete the reflector portion of the housing and support fluorescent lamp mounting sockets on each end. At each of the four corners of the housing, a fin 9 projects at 135° from the contiguous walls.

It can be seen that each of the bounding walls 71 slopes convergently downward to a lower outer edge 74 defined by the arris between the wall 71 and a planar ledge 77, the inner edge of which is in turn defined by a stop rib 78.

The slope of the end bounding walls 75 is identical with

that of the side walls 71. However, to accommodate lamp mounting sockets, the end walls 75 may extend downwardly to the level of the stop rib 78 of the side walls 71.

The lip 54 along the side walls 52 of the enclosure 5 projects inboardly of the lower outer edge 74 of the side bounding walls 71, and extends outboardly of the edge 74 to approximately the same vertical line as the upper edge of the bounding walls 71. The inner edge of the lip 54 terminates just short of the stop rib 78 to permit the upper edge of the lip 54 to seat against the ledge 77. At the ends, an upper inner edge of the lip 54 meets the sloping outer surface of the walls 75.

The latches 1 are mounted on the housing 7, spaced a short distance from the ends of the housing 7. Each latch 1 includes a V-shaped bracket 11. One arm 13 of the bracket 11 is mounted to the upper surface of the reflector wall 72 by sheet metal screws 17, the vertex 14 of the bracket 11 seats in the upper surface of the stop rib 78, and the other arm 15 of the bracket 11 is provided with an outwardly turned shelf 19 at its free end. One end of a leaf spring 21 is secured to the shelf 19 by a sheet metal screw 23. Adjacent the bracket 11 a slot 25 is provided in the housing 7. The slot 25 extends from the lower outer edge 74 of the side bounding wall 71, through the stop rib 78 and to a point approximately midway up the reflector wall 72. A tab 27 on the bracket 11 extends downwardly through the slot 25.

Pivotally mounted on the tab 27 by a rivet 29 is a latch plate 31. The latch plate 31 also extends through the slot 25. At its lower end the latch plate 31 is provided with an outboardly extending finger 33. Spaced above the finger 33 is a trigger shoulder 35 which also extends outboardly. At its upper end, the latch plate 31 is provided with an ear 37 which extends slightly beyond the upper margin of the slot 25 and the free end of the spring 21. Between the ear 37 and the trigger shoulder 35 the latch plate 31 is provided with a step 39.

Each latch plate 31 is movable from a stable closed position shown in FIG. 2 to a stable open position shown in FIGS. 3 and 4. In its stable closed position the lower, finger, part of the latch plate 31 is rotated outboardly by the force of the spring 21 against the ear 37, which is inboard of the pivot 29. The lip 54 on the enclosure 5 is thereby held snugly against the ledge 77 by the finger 33, which bears on the inner face of the lip 54. Excessive outboard rotation of the latch plate 31, which might otherwise occur if the latch plate 31 were accidentally moved to its closed position when the enclosure 5 was removed, is prevented by the fact that the lower face of the ear strikes the upper surface of the reflector wall 72.

The latch plate 31 can be moved to its stable open position by exerting downward pressure on the finger 33, which causes the latch plate 31 to rotate inboardly until the step 39 on the finger strikes the inner surface of the bounding walls 71. In the stable open position, the finger of the latch plate is urged inboardly by pressure exerted by the spring 21 on the ear 37, which overcenters before the step 39 strikes the side bounding walls 71.

The enclosure 5 may be swung away or removed from the housing 7 by the steps shown in FIGS. 3 and 4. First, the enclosure is merely pulled down by grasping the upper surface of the lip intermediate the length of the sides of the enclosure, which causes the latch plates 31 to move to their stable open position. The inner surfaces of the lip 54 remain in contact with the fingers 33 throughout this operation. The enclosure can now be moved sideways in either direction as shown in solid lines in FIG. 4. The latch plates do not move during this operation. A groove 55 in the lip 54 adjacent each latch plate increases the amount of lateral motion which may be given the enclosure 5, and facilitates its removal from the two latches on the side toward which the enclosure is moved. When one side of the enclosure is thus freed, it may be dropped down and the other side of the enclosure will remain suspended by the fingers 33 of the latches on the other side of the

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enclosure 5 as shown in broken lines in FIG. 4. If it is desired to remove the enclosure, it can simply be lifted from the fingers on which it rests. It will be noticed that in none of the steps after the latches are moved to their open position does any of the latches move in this illustrative embodiment.

For installing the enclosure, the opposite procedure is followed. The lip 54 on one side of the enclosure is hooked over the fingers 33 on the latches on one side of the housing 5, with the grooves 55 adjacent the latch plates 31. The free side of the enclosure is swung up and the enclosure is shifted toward the free side until the grooves 55 on the free lip clear the fingers 33 as shown in solid lines in FIG. 4. The enclosure is then centered and pushed upward until the lip 54 contacts the trigger shoulders 35 and forces the ears 37 to overcenter. The springs 21 then return the latch plates 31 to their closed position.

The latch plates 31 are preferably made of a high strength, slick, resilient-surfaced plastic, such as clear cellulose acetate butyrate or clear polycarbonate resin, which is easily molded, durable, easy on the enclosure, slick surfaced enough to permit easy sliding movement of the ear against the spring, and resilient enough to minimize vibration noise.

A second illustrative embodiment of latch 101 of this invention is shown in FIG. 5, again applied to holding the enclosure 5 to the housing 7. The latches 101 are essentially identical with the latches 1 of the first illustrative embodiment, except that the spring 121 is bent to provide more positive pressure on the latch plate 131 both in urging the latch plate 131 outboardly when it is in its closed position and in urging it inboardly when it is in its open position, than is provided the latch plate 31 by the spring 21 of the first embodiment. The operation of the latch 101 is identical with that of the latch 1 of the first illustrative embodiment.

A third illustrative embodiment 201 of latch of this invention is shown in FIGS. 6-8. The latches 201 are also used to hold the light transmitting enclosure 5 to the housing 7.

Each latch 201 includes a bracket 211 having two attachment wings 213 and a central housing section 215. The wing sections 213 are mounted to the upper surface of the reflector walls 72 by sheet metal screws 217, and the central housing section 215 overlies a slot 225 in the housing 7. The slot 225 is of the same length as the slot 25 of the first illustrative embodiment but is somewhat narrower. The central housing section 215 includes a horizontal upper wall 219 and a pair of vertical side walls 221. The bracket 211 is conveniently made of one folded piece of metal.

A pair of vertical slots 223 in the vertical side walls 221 of the bracket 211 are provided for slidably receiving a pivot pin 227 mounted through and between them. A torsion spring 228 is mounted on the pivot 227. The free ends of the torsion spring 228 extend outwardly upward through an aperture 229 in the horizontal upper wall 219 of the bracket 211. The torsion spring 228 provides a relatively firm stop position for the pivot pin when the pivot pin is at the top of the slots 223, allowing the pivot pin to be moved downward only with a pull significantly greater than the weight which it normally bears, and provides a relatively weak frictional stop, aided by gravity, when the pivot pin 227 is at the bottom of the slot 223.

A latch plate 231 is also mounted on the pivot pin 227. The latch plate 231 has an outboardly extending finger 233 at its lower end and an outboardly extending trigger shoulder 235 above the finger 233. A leaf spring 241, one end of which is bent to fit around the inner edge of the horizontal upper wall 219 of the bracket 211 and is held onto the wall 219 by the reflector wall 72, bears against the inner face of the latch plate 231 and urges the latch plate 231 outboard.

The latch plate 231 is movable from a stable closed position shown in FIGS. 6 and 7 to a stable open posi-

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tion shown in FIG. 8. In its stable closed position, its pivot pin 227 is urged firmly toward the top of the slot 223 in the bracket 211, and its shoulder 235 clears the lower outer edge 74 of the side bounding walls 71, thus allowing the spring 228 to urge the finger 233 upwardly and the spring 241 to rotate the finger 233 outboardly against the inner surface of the lip 54 on the enclosure 5. The lip 54 is thereby held snugly against the ledge 77 by the finger 233, which bears on the inner face of the lip 54.

The latch plate 231 can be moved to a stable open position by exerting downward pressure on the finger 233. This causes the latch plate 231 to move downward until the pivot pin 227 strikes the bottom of the slot 223 in the bracket 211. The latch plate 233 is held in its stable open position by gravity and by the friction of the spring 228 against the aperture 229 in the upper wall 219. Although the spring 228 exerts a considerable upward force when the latch plate 231 is in its closed position, it exerts continuously less upward pressure as the latch plate 231 is pulled down and virtually none when the latch plate 231 reaches its open position. The leaf spring 241 continues to exert some outward pressure against the latch plate 231, but the latch plate is restricted from outboard movement by its outboard edge above the shoulder 235, which bears against the outboard edge of the slot 225 at the lower outer edge 74 of the side bounding wall 71.

The enclosure 5 may be swung away or removed from the housing 7 by the steps shown in FIG. 8, which are, to the person performing them, virtually identical with the steps in removing the enclosure 5 when held by the first embodiment of latch of this invention. First, the enclosure is pulled down by grasping the upper surface of its lip intermediate the length of the sides of the enclosure. Pulling the enclosure 5 down causes the latch plates 231 to move straight down to their stable open position. The inner surfaces of the lip 54 do not move in relation to fingers 233 throughout this operation. The enclosure can now be moved sideways in either direction as shown in solid lines in FIG. 8. The latch plates on the side toward which the enclosure 5 is moved do not move during this operation. The latch plates on the other side of the enclosure, however, pivot inboard around the pivot pin 227, against the bias of the leaf spring 241. When one side of the enclosure is freed, it may be dropped down and the other side of the enclosure will remain suspended by the fingers 233 of the latch plates on its side. The enclosure can be removed, if desired, simply by lifting it from the latch plates on which it rests. It will be noticed that in this illustrative embodiment the latch plates 231 are stable with respect to movement toward their stable closed position but are not immobile when they are in their stable open position.

For installing the enclosure, the opposite procedure is followed. The lip 54 on one side of the enclosure is hooked over the fingers 233 on the latches on one side of the housing 5 with the grooves 55 in the enclosure 5 adjacent the latch plates 231. The free side of the enclosure is swung up and the enclosure is shifted against the bias of the leaf springs 241 toward the free side until the grooves 55 on the free lip clear the fingers 223 as shown in solid lines in FIG. 8. Momentary release of the enclosure 5 allows the inboardly rotated latch plates 231 to be rotated outboardly by springs 241 and thus to center the enclosure 5. The enclosure may then be pushed upward until the lip 54 contacts the trigger shoulders 235 and moves the latch plates 231 upward. As the springs 228 move upward in the apertures 229 they exert a stronger upward pressure and pull the pivot pins 227 firmly toward the top of the slots 223 in the brackets 211.

The latch plates 231 preferably have the same physical characteristics as the latch plates 31 of the first illustrative embodiment, and may be made of the same materials. Merely by way of example, the latch plate may be made of $\frac{3}{16}$ " plastic. The torsion spring may be eighteen gauge

music wire and the leaf spring may be .017 x $\frac{3}{16}$ inch spring steel.

A fourth illustrative embodiment of latch 301 of this invention is shown in FIGS. 9 and 10, again applied to holding the enclosure 5 to the housing 7.

The latch 301, except for minor differences in the proportions of parts, differs from the embodiment shown in FIGS. 6-8 only in a spring 328 on its pivot pin 327 and in providing a stop means for preventing inboard rotation of its latch plate 331 when the latch plate is in its closed position and excessive inboard rotation of the latch plate 331 when it is in its open position. The spring 328 in this illustrative embodiment is a double action leaf spring, the central bend of which is trapped by the pivot pin 327. A central slot 330 in the central bend of the double action leaf spring 328 is provided for mounting the latch plate 331 to the pivot 327. The double action leaf spring 328 provides the advantage over the torsion spring 228 of the previous embodiment that it prevents cocking of the pivot pin when the latch plate is moved up or down.

The stop means of this embodiment include a pair of wings 343 on the latch plate 331 which are positioned just outboard of a pair of inwardly turned tabs 345 on the lower margin of vertical side walls 321 of the bracket 311 of this illustrative embodiment. The upper inboard corners of the wings 343 are beveled to form cam surfaces 344. The inner edges of the wings 343 prevent inboard rotation of the latch plate 331 until the latch plate has been pulled to its open position, and then allow the latch plate 331 to be rotated inboard until the cam surfaces 344 on the wings 343 strike the lower faces of the inwardly turned tabs 345. To accommodate the wings 345, the outer part of slot 325 through which the latch plate 331 extends is made wider than the slot 225 of the previous illustrative embodiment. That part of the slot 325 inboard of the rib 78, however, is of the same width as the slot 225 of the previous illustrative embodiment. To enable the stop means to operate effectively, the slots 323 in the vertical side walls 321 of the bracket 311 and the aperture in the latch plate 331 through which the pivot pin 327 passes are positioned farther outboard than the corresponding apertures in the preceding illustrative embodiment.

The operation of this illustrative embodiment is precisely the same as that of the preceding illustrative embodiment.

A fifth illustrative embodiment of latch of this invention is shown in FIGS. 11 and 12 as applied to holding the enclosure 5 to the housing 7. This embodiment is particularly compact and effective.

A latch 401 differs from the latch 301 of the previous illustrative embodiment only in the proportions of some of its parts, and in the replacement of the two springs of the previous two embodiments, one for controlling the vertical movement of the latch plate and the other for controlling its rotational movement, with a single spring 428. The spring 428 is made from a single piece of wire and has a pair of outwardly extending arms 446 which extend through an aperture 429 in an upper wall 415 of a bracket 411 of this illustrative embodiment. A central span section 447 of the spring 428 bears against the inner face of the latch plate 431 of this illustrative embodiment. Because the latch plate 431 is prevented from excessive outboard rotation in either its open or closed position by the lower outer edge 74 of the housing 7, and because the spring 428 is bent approximately 90° out of its relaxed position, this arrangement provides at least as positive positioning and holding power as is provided by the two springs of the previous two illustrative embodiments. An elbow 448 in the arms 446 insures that the spring 428 exerts virtually no upward force after the latch plate 431 is pulled down to its open position and that it exerts a strong upward force as the latch plate 431 approaches its closed position.

As is shown in FIGS. 13-15, the use of the latch of this invention is not limited to the particular housing and en-

closure thus far described. In the illustrative embodiments shown in FIGS. 13-15, a circular enclosure 505 is held to a circular housing 507 either by placing latches in pairs on opposite sides of the circular enclosure as shown in FIG. 13, or by spacing them uniformly around the periphery of the fixture as shown in FIG. 14. In the latter case, care must be taken to provide sufficient space in the housing to accommodate the edge of the enclosure which moves upward when the opposite side of the enclosure is released from its latch, or to provide stop means for allowing the enclosure to be shifted only in a direction which will free it from more than one latch. The enclosure 505 has an inturned lip 554 having an upward curl 555 at its inner edge. The housing 507 includes a side bounding wall 571 having an inturned lip 572 at its lower margin. A bezel 573 is secured to the inturned lip 572, and a gasket 574 is secured to the inner margin of the bezel 573. The upper surface of the lip 554 on the enclosure 505 abuts the gasket 574 when the enclosure 505 is mounted on the housing 507.

Each latch 501 is generally identical with the previous embodiment of latch of this invention 401 except for the contour of the finger of the latch plate and the shape of the bracket 511, which is modified to fit the housing 507. On the inner edge of the latch plate 531 a small tab 532 is provided, against which the central span section 547 of the spring 528 bears, and which prevents the latch plate 531 from rotating excessively outboard when it is in its open position. The latch bracket 511 differs from the bracket 411 of the preceding embodiment in that its attachment wings 513 are on the outer, rather than inner, edge of the bracket and are attached directly to the side bounding walls 571.

Numerous variations in the latch of this invention, within the scope of the appended claims, will occur to those skilled in the art in the light of the foregoing description.

Having thus described the invention, what is claimed and desired to be secured by Letters Patent is:

1. In a fixture with an enclosure having an inturned lip on at least two opposite sides, said lip having an upper surface and a lower surface, and a housing above the enclosure having a part against which the enclosure abuts, the improvement comprising concealed latch means for supporting said enclosure in a first position in abutment with said housing and in a second position spaced from said housing, and for permitting downward hinging of said enclosure from said second position about a part of said latch means, said latch means comprising a pair of bi-stable latches mounted on said housing, the first of said latches being positioned to engage said lip on the first of said two opposite sides of said enclosure, and the second of said latches being positioned to engage said lip on the second of said two opposite sides of said enclosure, each of said latches comprising a bracket and a latch plate movably supported by said bracket, said latch plate being movable to a stable closed position and a stable open position, said latch plate comprising outwardly extending finger means, for engaging the lower surface of said inturned lip both in said open position to support said enclosure in said second position and also in said closed position to urge the enclosure into abutment with the housing.

2. The improvement of claim 1 wherein said latches are so constructed and arranged with respect to said enclosure that when said latch plates are in their open positions and said enclosure is in its second position, the enclosure may be moved laterally for removal of the lip on the first of said two opposite sides from the first latch and engagement of the lip on the second of said two opposite sides by the finger of the second latch, said finger of the second latch being constructed and arranged to support said enclosure hingedly when said first of said two opposite sides is removed from said first latch.

3. The improvement of claim 2 wherein each of said latches comprises a trigger means on said latch plate, con-

structed and arranged to be engaged by the enclosure at a stage in mounting the enclosure, for releasing the latch plate from its stable open position when said trigger means is engaged by the enclosure and moved toward the housing by it.

4. The improvement of claim 3 wherein the trigger means comprises an outboardly extending trigger shoulder above the finger, said trigger shoulders and said lip on said opposite sides of said enclosure being so constructed and arranged that said trigger shoulders are engaged by said upper surface of the lip on said enclosure at a stage in mounting the enclosure.

5. The improvement of claim 1 wherein said fixture is a lighting fixture, said enclosure is made of a light transmitting material, and said housing is a lamp housing.

6. The improvement of claim 2 including a pivot, around which said latch plate is rotatably mounted and a first spring, said spring urging said finger outboardly when said latch plate is in its open position.

7. The improvement of claim 6 wherein said latch plate is slidable in said bracket from an upper position when the latch plate is in its closed position, to a lower position when the latch plate is in its open position.

8. The improvement of claim 7 wherein said finger is inboardly rotatable about said pivot against the bias of said first spring when said latch plate is in its open position, and said latch plate is held in its upper position by a second spring operatively attached to said latch plate, two legs of said second spring being biased apart and passing through a cooperative member in said bracket, said legs bearing against said cooperative member for holding said latch plate in its upper position and allowing said latch plate to be moved downwardly to its lower position by a simple pull.

9. The improvement of claim 7 wherein said first spring includes a leg passing through a cooperative member in said bracket, said leg bearing against said cooperative member for holding said latch plate in its upper position and allowing said latch plate to be moved downwardly to its lower position by a simple pull.

10. The improvement of claim 2 wherein the latch plate is movable from its stable closed position to its stable open position by rotation around a pivot, the finger being rotated laterally inboardly at the stable open position of the latch plate a distance less than the width of the inturned lip and greater than half the width of the inturned lip.

11. The improvement of claim 10 including a spring bearing on a cam surface on said latch plate, said spring and said cam surface being adapted to urge said finger outboardly when said latch plate is in said closed position and inboardly when said latch plate is in said open position.

12. The improvement of claim 1 wherein said latch plate is made of a light transmitting material.

13. In a fixture with an enclosure having an inturned lip on at least two opposite sides and a housing above the enclosure having a part against which the enclosure abuts, the improvement comprising a pair of bi-stable latches mounted on said housing, the first of said latches being adapted to engage said lip on the first of said two opposite sides of said enclosure, and the second of said latches being adapted to engage said lip on the second of said two opposite sides of said enclosure, said latches being so constructed and arranged with respect to said enclosure that when said latch plates are in their open positions the enclosure may be moved laterally for removal of the lip on the first of said two opposite sides from the first latch and engagement of the lip on the second of said two opposite sides by the finger of the second latch, said finger of the second latch being adapted to support said enclosure hingedly when said first of said two opposite sides is removed from said first latch, each of said latches comprising a bracket mounted in said housing; a vertical slot in said bracket; a latch plate, said

latch plate being movable to a closed position and an open position, said latch plate comprising an outboardly extending finger, said finger being adapted to engage the lip of the enclosure and to urge the enclosure into abutment with the housing when said latch plate is in its closed position; a pivot, around which said latch plate is rotatably mounted, said pivot comprising a pivot pin, said pivot pin being slidable in said slot from an upper position when the latch plate is in its closed position to a lower position when the latch plate is in its open position; and a first spring, said spring urging said finger outboardly when said latch plate is in its closed position.

14. The improvement of claim 13 wherein said finger is inboardly rotatable about said pivot pin against the bias of said first spring when said latch plate is in its open position, and said pivot pin is held in its upper position by a second spring operatively attached to said pivot pin, two legs of said second spring being biased apart and passing through a cooperative member in said bracket above said pivot pin, said legs bearing against said cooperative member for holding said pivot pin in its upper position and allowing said pivot pin to be moved downwardly to its lower position by a simple pull.

15. The improvement of claim 13 wherein said first spring is operatively connected to said pivot pin and includes a leg passing through a cooperative member in said bracket above said pivot pin, said leg bearing against an outer surface of said cooperative member for holding said pivot pin in its upper position and allowing said pivot pin to be moved downwardly to its lower position by a simple pull.

16. The improvement of claim 13 wherein said latch plate is made of a light transmitting material.

17. In a fixture an enclosure having an inturned lip and a housing above the enclosure, the improvement comprising concealed latch means for supporting said enclosure in a first, closed, position and in a second position spaced downwardly from said first position, and for permitting downward hinging of said enclosure from said second position about a part of said latch means, said latch means comprising at least three bi-stable latches mounted on said housing, each of said latches comprising a part movable to a stable closed position and a stable open position, said part comprising outwardly extending means for engaging the lower surface of said inturned lip both in said closed position to hold said enclosure in said first position and also in said open position to hold said enclosure in said second position.

18. The improvement of claim 17 wherein said latches are so constructed and arranged with respect to said enclosure that when said movable parts are in their open positions and said enclosure is in its second position, the enclosure may be moved laterally for removal of the lip from one of the latches and engagement of the lip by two other latches for supporting said enclosure hingedly when said lip is swung downwardly from said one latch.

19. The improvement of claim 18 wherein said latch means includes at least four latches, said latches being so arranged that the enclosure may be moved laterally for removal of the lip from two of said latches simultaneously when said movable parts are in their open positions and said enclosure is in its second position.

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U.S. Cl. X.R.

16—147; 240—147; 292—78