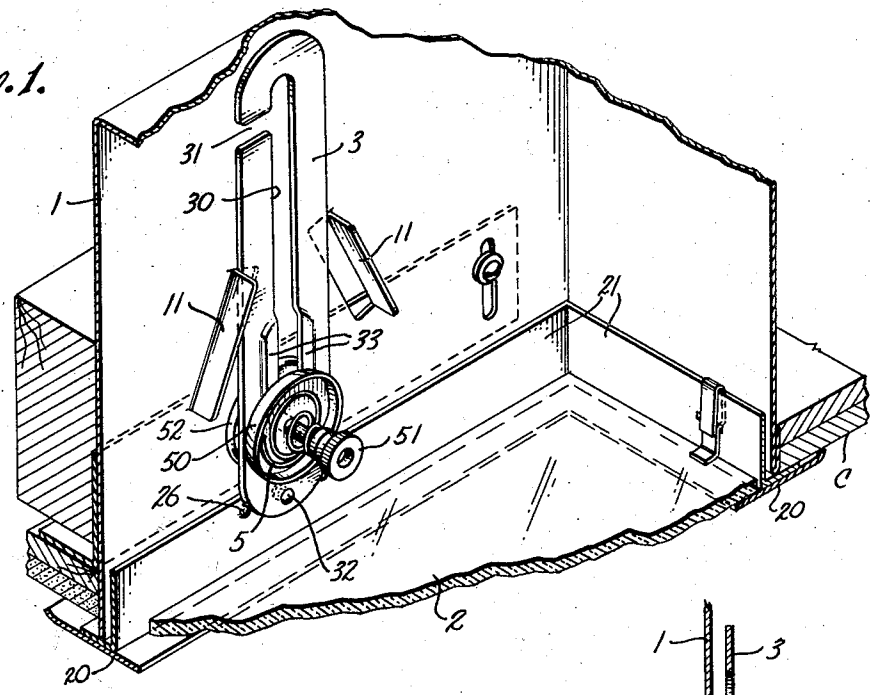
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CLOSURE SUPPORTS FOR LIGHTING FIXTURES

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Fig. 1.



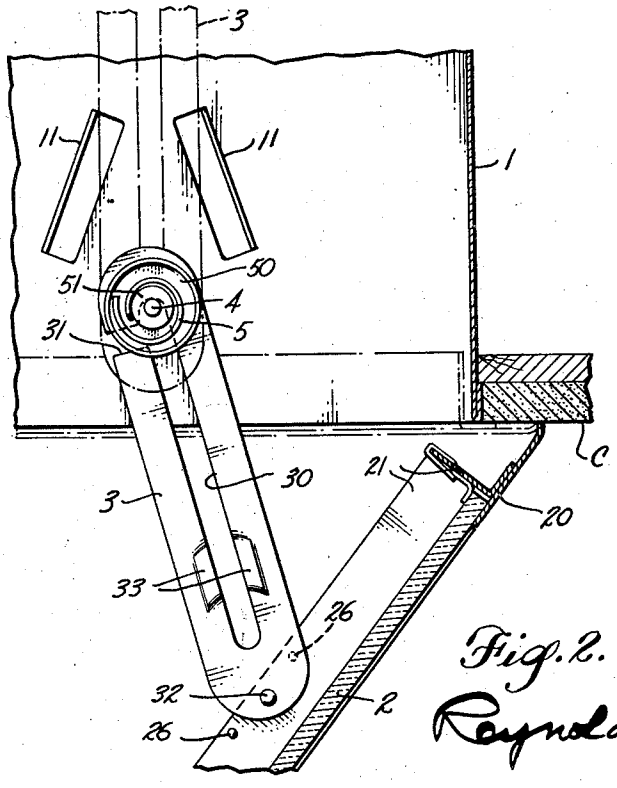


Fig. 2.

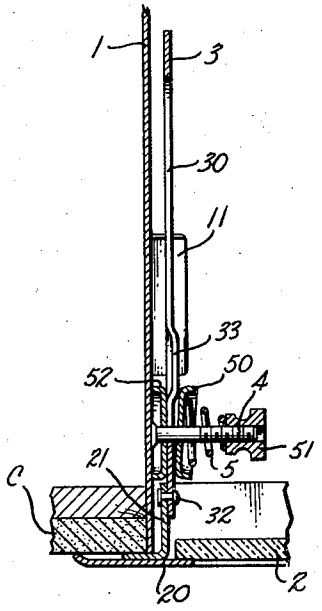


Fig. 3.

INVENTORS.
CHARLES BRYANT MacDOUGALL
HERBERT E. BEARWOOD
BY
Reynolds, Beach & Christensen
ATTORNEYS

Oct. 7, 1958 C. B. MacDOUGALL ET AL 2,855,504

CLOSURE SUPPORTS FOR LIGHTING FIXTURES

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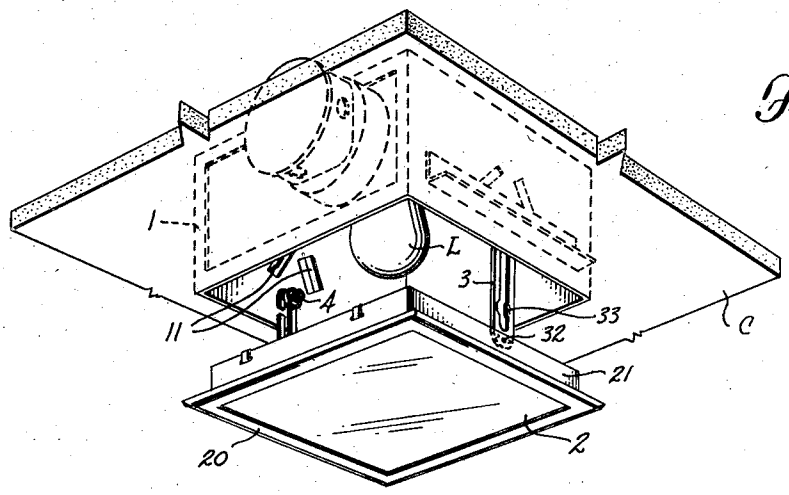


Fig. 4.

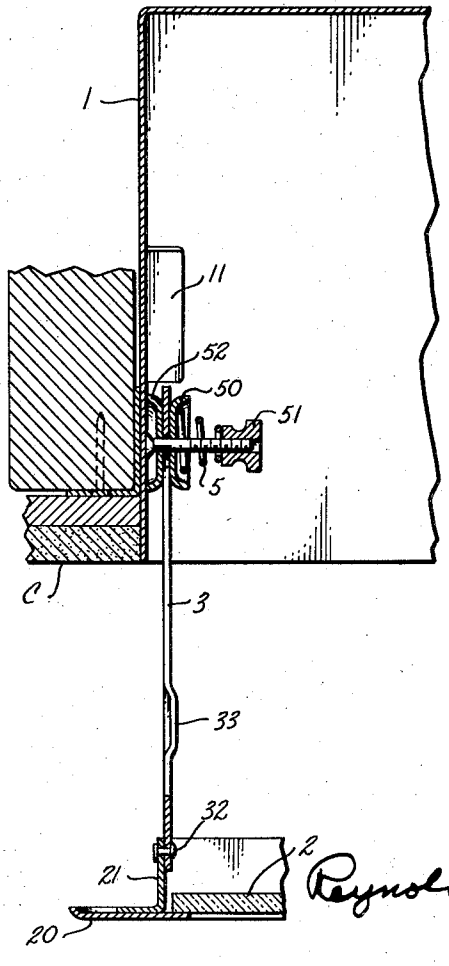


Fig. 5.

INVENTORS.
CHARLES BRYANT MacDOUGALL
HERBERT E. BEARWOOD
BY
Reynolds, Beach & Christensen
ATTORNEYS

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CLOSURE SUPPORTS FOR LIGHTING FIXTURES

Charles Bryant MacDougall and Herbert E. Bearwood, Seattle, Wash., assignors to Nemco Electric Co., Seattle, Wash., a corporation of Washington

Application July 9, 1956, Serial No. 596,655

1 Claim. (Cl. 240—147)

This application is a continuation in part of our previously filed application Serial No. 488,018, filed February 14, 1955, now abandoned. It includes all the various distinctive features of the invention claimed in that application, and certain additional features which further improve the construction as a whole.

More especially the present invention concerns a lighting fixture which is inset into the ceiling so that the box and the lamp are wholly within the ceiling and above the plane thereof, and the open lower end of the box is covered with a removable translucent closure of any suitable form, for instance, one which may be substantially flush with the surface of the ceiling. The form of the closure, so long as there is one, is no part of this invention except as it cooperates with the box to limit upward movement of the closure, and as a portion of the closure fits within the entrance to the box. The lamps in such fixtures burn out from time to time and must be replaced, and so it is essential that the closure be readily movable from its closed position into a position affording ready access to the interior of the box for relamping, and that when the closure is restored to its closed position, it will go smoothly and easily back into the proper position and will stay there. At the same time, it is highly desirable to avoid the necessity of employing retaining screws or latches for securing the closure in its closed position, not only because this adds to the expense of the fixture and the difficulty of effecting re-lamping, but also because it tends to detract from the smooth unbroken appearance of the fixture.

In this fixture the translucent closure is mounted upon the inset box by means of two links at opposite sides, which links are slidably and pivotally held to the box, permitting the closure to be pulled down from its closed position and to be swung to either side, equally widely, the pivot connection incorporating friction means which can be adjusted to retain the closure in any adjusted position, and which afford preferably an increased friction to retain the closure in its upraised fully closed position. The closure otherwise is devoid of any connection to the box, the links and their supporting means on the box constituting the sole interconnection. It will be realized that it is not a wholly simple matter for a workman upon a ladder to push the closure back properly from below into its closed position after re-lamping the fixture, especially since for purposes of affording freer access to the box, the closure is preferably pivotally connected to the lower ends of the links, which themselves are pivotally connected to the box. Accordingly, it is an object of the present invention to provide guide means of simple construction so located and arranged as to engage the links automatically as they move upwardly toward the fully closed position, and will guide them, in conjunction with the pivotal connection, so that it is virtually impossible to displace the closing closure into incorrect position with relation to the box.

It is also an object to provide means whereby the pivot between the lower end of the links and the closure, although present and capable of use when needed, is substantially automatically rendered inoperative when the closure is being closed, so that, in effect, the links and the closure are rigidly interconnected with one another, with the links at right angles to the plane of the closure, and there remains only the pivotal connection between the links and the box to contend with in moving the closure back to its closed position, and in guiding it by the guiding means previously mentioned.

It is desirable that the closure move with some freedom in its movements from and back into closed position, despite the frictional retaining means which retains it in its closed position, or which can be adjusted to maintain it in any position of adjustment. At the same time, it is highly desirable that the closure be held strongly in its closed position, once it attains that position. Moreover, sometimes the box is installed not quite flush with or level with the surface of the ceiling, and the closure in a particular installation may not always fit in the same relationship to the box when closed as it does in other installations. In other words, there is no precise position as between the closure and the box which constitutes in all installations the closed position, and contact of a rim of the closure, outstanding beyond the edge of the box and engageable with that edge or with the surrounding ceiling, stops upward movement of the closure and determines its closed position. It is an object of the present invention to provide means whereby the closure will be held more strongly in any such fully closed position than in open positions, regardless of any variations in that closed position as between different installations, yet will move with relative freedom in positions other than the closed position or positions close to the latter.

As in the original application, it is desirable to mount the closure in such a way that it may be readily swung to either side and opened sufficiently widely that a workman on a ladder, for instance, may readily remove a burned out lamp and replace it with a new one, and may do this without the necessity of releasing any manual latch or other mechanism which he must operate in order to gain access to the interior of the box, and without the use of any tool.

It is also an object of this invention to mount the cover in such a way that it may be readily removed bodily from time to time so that the lens or translucent portion thereof may be washed or otherwise cleaned, and to do this by a simple and inexpensive construction.

It is particularly an object of this invention to mount such a translucent cover, having the advantages and capabilities indicated above, in which the construction of the closure mounting means is of the highest order of simplicity, so that it is both simple mechanically and operationally, and of low cost.

Such lighting fixtures and their closures may be, and preferably are, provided in a variety of styles, and it is an object to provide a lighting fixture and a support for the closure thereof which, without change, is suited to support any of several different styles of closure. This invention is concerned with the support, rather than with any particular form of closure, and any suitable closure, with the reservations noted above, can be employed with the support of this invention.

With such objects in mind, and others as will appear more fully hereinafter, the present invention comprises the novel closure support for such lighting fixtures as shown in the accompanying drawings, and as will be more fully explained hereinafter and defined in the claim.

The present invention as illustrated in the accompanying drawings, includes a box for permanent installation in the ceiling and open at its lower end, a translucent closure of one kind or another for such a box, and two

links, with pivot pins on the box, constituting the sole interconnection between the closure and the box. Such links are located at opposite sides of the box in such manner that the closure may be lowered and swung aside or may be raised until the surrounding flange of the closure contacts the ceiling, or the edge of the box, together with frictional means engaged with the suspending links in such way that these links are pressed against the side of the box with a frictional force that may be adjusted, in accordance with the weight of the closure, to retain the closure in its closed position, or alternatively, in any given position of adjustment. The closure support of this invention includes also cam means associated with the frictional support, which are so arranged with relation to the pivotal connection between the links and the box as to increase the frictional force as the closure comes into and remains in its closed position, to hold it more strongly in that closed position. The invention includes also guide flanges converging inwardly and upwardly and located in the path of the upwardly moving upper end of the links, above and cooperating with the pivotal connection in such a way that the links in their final upward movement into closed position are necessarily held correctly upright and serve as guides for the closure, to bring the latter fully and fairly into registry with the open lower end of the box. The suspension system includes, also, provision for releasing the links quickly and easily from the pivot connection, so that the closure and the links which are secured thereto may be bodily removed for cleansing.

Figure 1 is an internal isometric view of a portion of the box and closure, showing parts in the fully closed position.

Figure 2 is a side elevational view of the same parts, but showing the closure in its open and swung-aside position.

Figure 3 is a sectional view of the support, taken on the axis of the pivotal connection, and showing parts in the closed position.

Figure 4 is an isometric view from below illustrating the closure in its lowered position, from which it is capable of being swung aside for freer access to the lamp within the box.

Figure 5 is a view similar to Figure 3, but showing the closure in the lowered position as in Figure 4.

Each such installation includes a box 1 which is usually generally rectangular, intended to be permanently installed in any suitable fashion in the ceiling, open at its lower end, and with its lower edge desirably installed flush with the finish surface of the ceiling C. It is not always possible to insure that it is exactly flush, for it is installed before the ceiling is finished, and it may be found that the open end of the box is inset by a fraction of an inch within the ceiling surface, or it may even project slightly or be cocked with relation to the ceiling. The present invention will accommodate such variations, however, for the most part. The manner of supporting the box may be any that is commonly employed in the art, and since there are various ways known of supporting such boxes, no details of that support have been illustrated particularly.

Within each box is provided a socket (not shown) wherein may be mounted a lamp globe L (Figure 4). This will occasionally burn out and must be removed and replaced, and it is this necessity primarily which makes necessary the present invention. All such ceiling fixtures are closed with one kind or another of a translucent closure, and any suitable kind of closure may be used, for the style thereof is immaterial to the support wherein this invention resides. For instance, the plane glass 2 of Figures 1, 2 and 3 is supported about its edges by a marginal frame 20, having an upstanding rim 21 which fits within the open end of the box 1, and to which connection is made by the supporting links to be described hereafter. The upstanding flange 21 will constitute a light stop, inasmuch as it fits closely within the walls of the box when the closure is in its upraised or fully closed position. The frame 20, when used, also extends outwardly of the edges of the box to define a decorative frame about the glass lens 2, and to contact the ceiling or the edge of the box, as a stop to position the closure in its fully upraised position.

The closure is supported from the box through the medium of two links 3 which extend upwardly from opposite sides of the closure, preferably in the vicinity of the midpoint of each such side, and which lie close alongside the walls of the box 1, usually sliding within the box. Each such link engages a pivot pin 4 that extends inwardly from the wall of the box not far above the lower edge of the box. The interconnection between the link 3 and the pivot pin 4 is both a pivotal one and a sliding one. To enable sliding, the link is formed with a longitudinally directed slot 30, and is notched at 31 slightly below the upper end of the longitudinal slot 30 for hooking the link over the pivot pin 4, yet preventing accidental disengagement between the two.

Each link is desirably pivotally connected at 32 to the flange 21 of the closure. This pivot is located very close to the lower end of the link, and is parallel to the axis of the pivot pin 4. The pivoting at 32 is desirable at certain times and at other times is undesirable, wherefore, in order to hold the links, in effect, rigid with the closure and at right angles to the plane of the closure, it is preferable to provide dimples 26 (see Figure 2), which when parts are in the position of Figure 1 or of Figure 4, will engage equally the end of the link 3 at opposite sides of the pivot 32, and so will tend to hold the link at right angles to the plane of the closure. Nevertheless, the closure can be swung with relation to the links by overcoming the resistance of the dimples 26, as is shown in Figure 2, and when this occurs it permits wider swinging open of the closure, to either side.

In order to hold all parts in any given position of vertical adjustment, friction means are employed consisting conveniently of a friction washer 50, bearing upon the surface of the link 3, and a spring 5 reacting from a nut 51, adjustably threaded upon the end of the pivot pin 4 and urging the washer frictionally against the link 3, and the latter against the side wall of the box or against a washer 52 interposed therebetween. The pressure of the spring may be adjusted readily by the nut 51 to whatever extent may be necessary to accomplish the end in view, and to accommodate closures of differing weight.

However, it is desirable to permit the link to slide somewhat freely along the pivot pin 4 except as it may be necessary to retain the closure in its fully closed position. Accordingly, a device is provided for insuring an appreciable increase in the pressure of the spring 5 when parts nearly reach the fully closed position, and while they are in the latter position. Cam protuberances 33 are pressed above the plane of the link 3 at opposite sides of the slot 30 at a location where they will engage the washer 50 when parts are in the closed position, and as they approach that closed position. Accordingly, since they press the washer 50 in a direction to increase the pressure of the spring 5, the spring pressure can be adjusted to have such value that it will retain parts in any adjusted position, yet, will slide with reasonable freedom, and by the application of slight force, from a partly open to the fully open position, but the spring will have the added cam-induced force to retain parts quite securely in the fully closed position, and this will be true regardless of the fact that the box may not be set precisely flush with the ceiling, for the cams 33 are of such longitudinal extent as to accommodate any possible discrepancies in the setting of the box relative to the surface of the ceiling.

When it is necessary to gain access to the interior of the box 1, either for re-lamping, for adjustment of the

nut **51**, or for removal and cleaning of the translucent closure, it is only necessary to pull the closure **2** or its frame **20** downwardly, and the links **3** will slide with relation to the pivot pin **4** until the upper end of the slot **30** engages the pivot pin and stops further downward movement. The links and the supported closure may now be swung aside. Ordinarily, the upstanding flange **21** would be engaged with the side edge of the box as a pivot. The closure can be swung even farther open by swinging it relative to the links about the pivot at **32**. This leaves the interior of the box freely accessible, and when the necessity for access has passed, the closure is swung into its right angular relation to the links **3**, the dimples **26** again engaging the end of the links to hold parts in this position, and then the closure is pushed upwardly. However, it has been found that it is difficult for a workman to guide the closure from below accurately into registry with the box and into its fully closed position. To assist in accomplishing this, we have provided guide flanges **11** converging upwardly and inwardly, and located somewhat above the location of the pivot pins **4**, possibly at one side of the box only but preferably at both sides to engage both links, and these flanges **11** will engage the upper end of the upwardly moving link or links and guide the latter into a correctly upright position in the manner shown by the dot-dash lines in Figure 2. Since the links and the closure are held in right angular relationship by the dimples **26** and are guided in precisely vertical movement by the flanges **11**, it is clear that the closure will be guided precisely into the proper position with relation to the box, and the flanges **21** will move properly into the open lower end of the box without any interference or difficulty. Once the parts have reached the fully closed position, the cam means at **33** will insure their retention in that position.

The flanges **11** have an incidental effect which is desirable, namely, they afford some measure of ventilation to the interior of the box, and are quite acceptable to the underwriters.

It will be appreciated that the frictional retaining means, namely, the spring **5** and the associated parts, may be

employed at only one side of the box, although desirably it is employed in connection with both the links and their pivot pins. Similarly, the flanges **11** might be provided at one side only, but again it is preferred that they be employed in conjunction with both links.

We claim as our invention:

A ceiling lighting fixture consisting of a box open at its lower end, a translucent closure for such open lower end, two upright and longitudinally slotted links each pivotally secured at its lower end to the respectively opposite sides of the closure, and extending thence upwardly in contact with the corresponding sides of the box, a pivot pin on said box received in the longitudinal slot of each link, to constitute a pivotal connection between the links and the box and also a guide for upward and downward movement of the links relative to the box, yieldable means carried by at least one pivot pin, and pressing the corresponding link frictionally against the side of the box, as the sole means to retain the link and closure in any upraised position, including the fully closed position, cam means on the link located to interengage between the yieldable friction-producing means and the corresponding link, as the closure approaches its fully closed position, to increase the friction-producing force thereof, and spaced guide elements outstanding from the wall of the box, intermediate the lowermost and uppermost locations of the upper end of at least one link, and converging upwardly and inwardly towards the link's path, for engagement by such link's upper end as it moves upwardly, as a guide to position the links in upright position as the closure approaches its fully closed position.

References Cited in the file of this patent

UNITED STATES PATENTS

1,119,892	Socin	Dec. 8, 1914
2,636,978	Williamson	Apr. 28, 1953
2,639,368	Pryne	May 19, 1953
2,723,776	Jacobson	Nov. 15, 1955
2,775,781	Morgan	Jan. 1, 1957