United States Patent

Decker et al.

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[54] **WARNING LIGHT HOUSING**

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[52] **U.S. Cl.**.....**240/10.6**, 40/125 H, 52/64, 116/63 P, 256/13.1, 340/81

[51] **Int. Cl.**.....**F21l 3/00**

[58] **Field of Search** .....116/63, 63 P; 40/125 N; 240/10.6, 2 R; 52/64, 174; 340/114, 81, 115, 331, 119; 256/13.1, 64; 248/382, 398, 176, 188.7

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[57] **ABSTRACT**

A housing for an electric warning light comprising a base functioning as a platform to support batteries, a casing enclosing a region above the base, and a lens and lamp assembly atop the casing. The casing attaches to the base by a pivoted connection, which allows for speedy separation of the two members, and the base is a cantilevered member with an upstanding pier at one side from which the housing is supported by a through bolt protruding from the pier. A relatively thin shroud extends upward from the margin of the side of the base at which the pier is positioned, and a channel on the outboard side of the pier complements an arcuate notch in a side of the casing to form a wind and water repellant union of the base and casing at the point where the housing is mounted.

6 Claims, 6 Drawing Figures

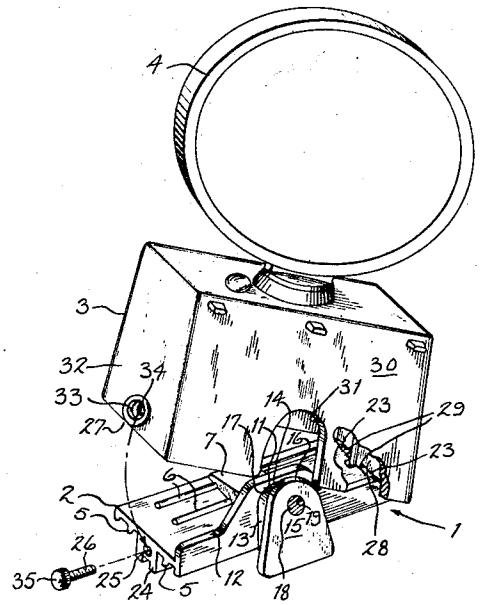


Fig. 1

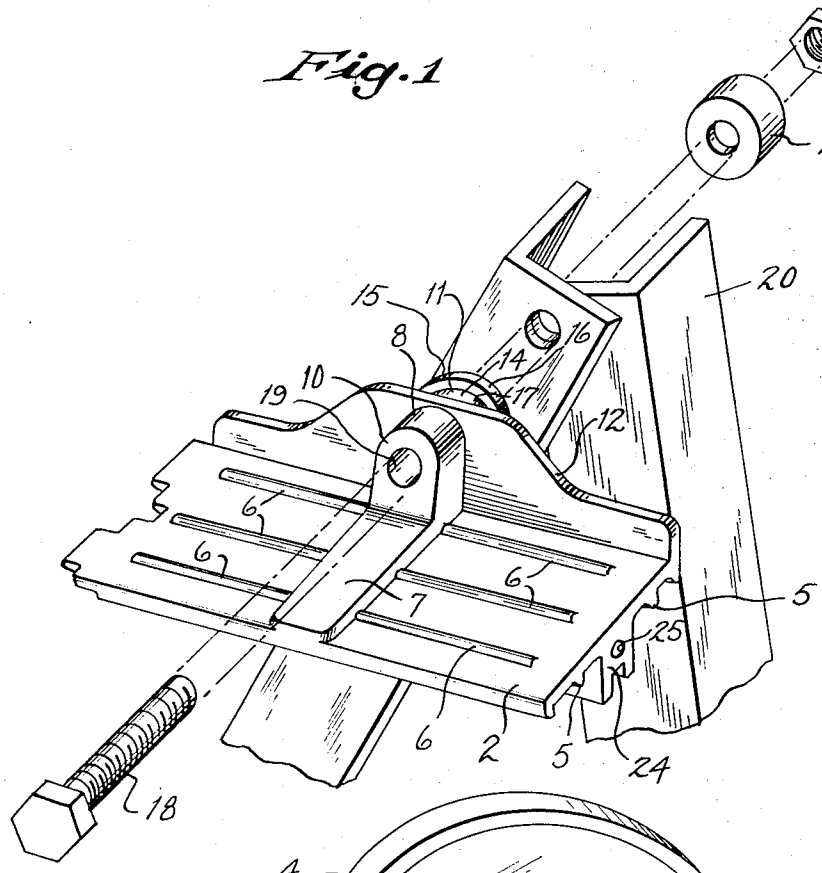
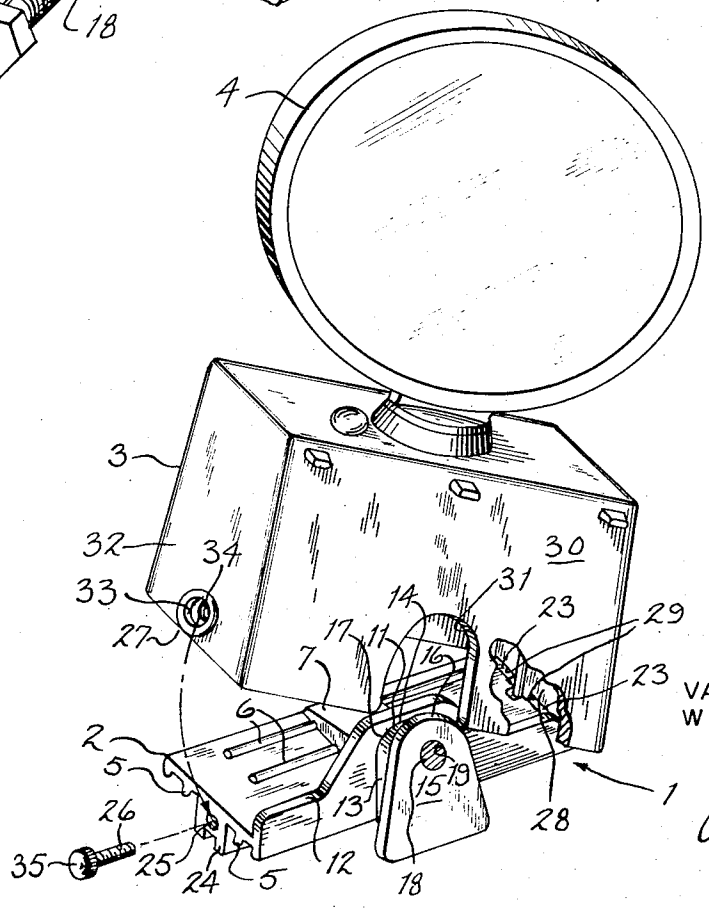


Fig. 2



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Fig. 3

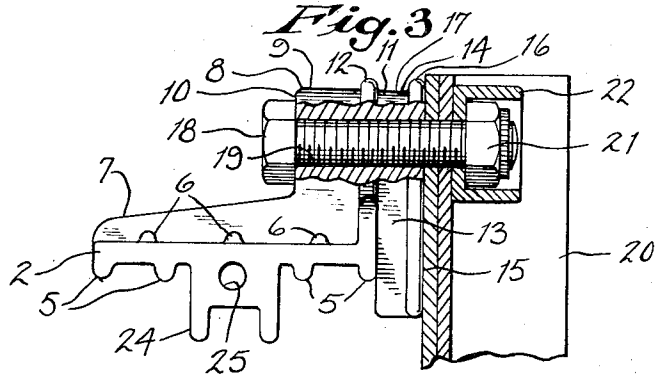


Fig. 4

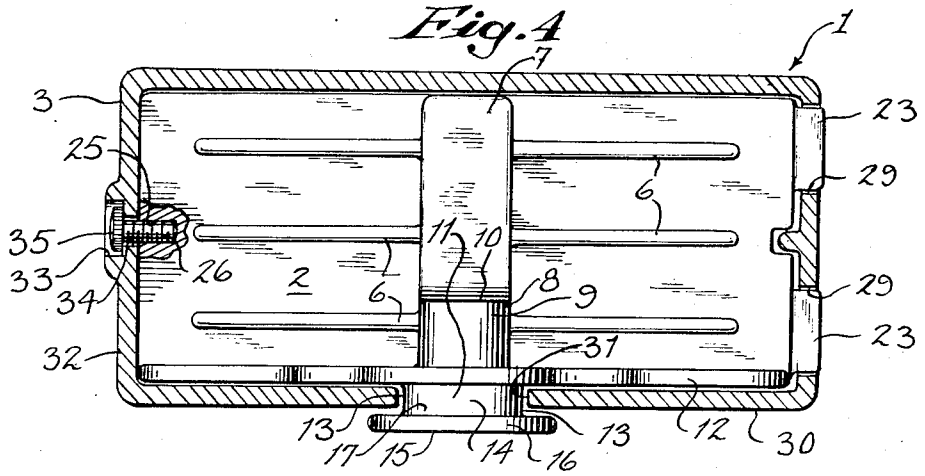


Fig. 5

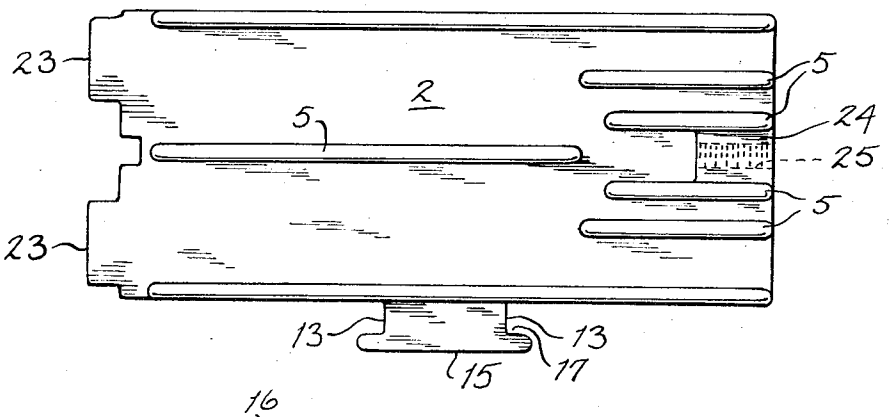
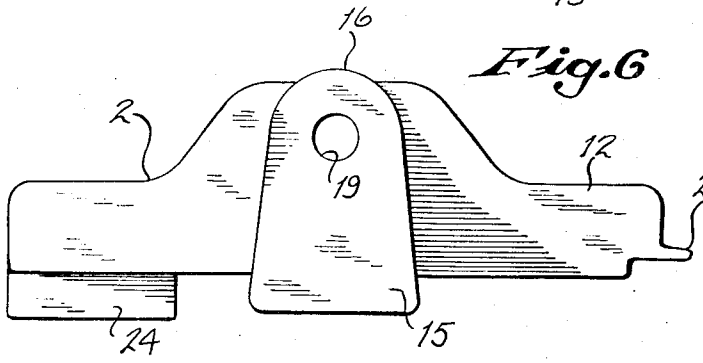


Fig. 6



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WARNING LIGHT HOUSING

BACKGROUND OF THE INVENTION

Electric warning lights attached to traffic or construction barricades have proved extremely valuable in terms of safety. However, the problem has arisen that they have become a target for destructive vandalism and thievery, most likely resulting because the lights and batteries of the electrical circuit they house have an inherent attraction to passersby, in addition to many uses other than in a warning light. To thwart vandals and thieves, a warning light housing should be usually durable, and must be attached to a barricade in such a manner that it is not easily removed by unauthorized persons. On the other hand, regular routine maintenance is required for electric warning lights to maintain batteries and lights in working order, and to repair any damage resulting from abusive treatment on the part of road crews and construction workers, as well as from vandals and thieves. It has been found that it is dangerous to perform such repairs and routine maintenance at a barricade site, because of the potential hazards from the flow of nearby vehicular traffic. Therefore, the best practice is to remove the working electrical components and a part of the housing from a barricade and perform maintenance on these components at a central shop. This requires at least part of the housing of a warning light and its electrical components should be easily removed from a barricade by authorized personnel. The resulting cross purposes, of easy removal by authorized persons, but difficult removal by others, should be fulfilled by a warning light design.

In the past, there has been no housing available which has satisfied all the above named objectives. Either the entire housing is permanently attached to a barricade, as in U.S. Pat. No. 3,015,804, or a principal part of the housing that mounts the electrical components is temporarily attached to a barricade in such manner that it cannot be quickly removed to facilitate repair and routine maintenance. The major problem inherent in both of these prior structures is that their repairs must either be made at the barricade site, or else their means of attachment to the barricade must be dismantled to allow removal of the case from the barricade. This complete dismantling consumes excessive time for economical repair at central shops, but on the other hand, as noted above, there is the additional defect in a temporarily attached housing that it is too easily removed surreptitiously by vandals. Thus, the problem of a lack of satisfactory housing for barricade mounted warning lights remains.

SUMMARY OF THE INVENTION

The present invention represents improvements in a housing for a warning light comprising a base member semi-permanently attached to a barricade through a pier upstanding at one side of the base, and a casing fitting over the base with a configuration covering and complementing the pier portion of the base to allow the pier to extend from within the casing to an exposed part that attaches to a barricade outside the housing.

A preferred form of the invention has a base forming the lower part of a housing. This base constitutes a platform upon which batteries of the electrical circuit may rest, and it also serves as the member that is attached to a barricade. The attachment is semi-permanent, in the sense that for normal use the base will remain affixed to a barricade, and removal can only be carried out by use of a special tool, or through painstaking work in which one would normally not engage. A casing fits over the base to function as an enclosure for electrical components, and it cooperates with the base to provide a sufficiently weather-tight enclosure to inhibit the entrance of wind and rain.

To obtain a durable base having a large area devoted to a flat platform for supporting batteries, a pier is provided at one side of said base. This pier occupies a minor fraction of the total base area, and the pier, with a through bolt extending through the upper portion of the pier, serves as the main supporting connection for attachment to a barricade. It is a feature of the construction to have a casing that mates with the pier to form a weather-tight closure. In a preferred form of the invention the weather-tight aspects are enhanced by provision of a thin-walled shroud along the side of the base on which the pier is disposed. The pier and shroud merge with one another, with the pier lending physical integrity and strength to the shroud. The casing then fits over the base, and conforms with the outer face of the pier to effect the weather-tight construction, while allowing an outer portion of the pier with its exposed face to protrude for attachment of the base to a barricade or similar device.

It is a particular object to enclose an end of the through bolt within the housing, so that it cannot be turned or manipulated for loosening and removing the base. This requires a cooperative relationship between base and casing in which the casing complements the part of the base through which the through bolt emerges. The other bolt end that enters a barricade is closely surrounded so that usual tools cannot be applied for loosening the bolt.

Other objects of this invention are to provide a warning light housing that is durable to withstand abusive treatment; that is securely attachable to a barricade for preventing loss from theft; and that includes a case member removable for maintenance purposes which mounts the lens and light assembly, and which when removed can contain the batteries and components of the electrical circuit, so that all working parts can be removed and taken to a central repair shop.

The foregoing and other objects and advantages will appear from the following description. In the description, reference is made to the accompanying drawings which show by way of illustration and not of limitation a specific embodiment of the invention. Such embodiment does not represent the full scope of the invention, but rather the invention may be employed in different embodiments, and reference is made to the claims herein for a determination of the scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view in perspective of a base forming part of a warning light housing of the invention and of a portion of a barricade to which the base may be attached,

FIG. 2 is a view in perspective of the base of FIG. 1 together with a casing associated with the base,

FIG. 3 is a side view in elevation of the base as mounted upon a barricade and having parts broken away and in section to show the nature of the mounting,

FIG. 4 is a view in elevation of the base encircled by the casing as occurs when the parts are assembled, but with parts broken away and in section,

FIG. 5 is a bottom view of the base, and

FIG. 6 is a side view in elevation of the base.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, FIG. 2 illustrates a housing 1 for a warning light consisting of a base 2, a casing 3 and a lens and lamp assembly 4 atop the casing 3. The housing 1 contains the operating electrical components of the light which consist primarily of batteries, switches, flasher circuit and a lamp, plus the wiring between these components. The operation of this electrical system is not relevant to the invention disclosed in this application, and therefore the system will not be described in further detail. The casing 3 is partially raised from its normal position in FIG. 2 to show the interconnection of the parts that make up the housing 1, and to expose the base 2. The base 2 is illustrated more fully in FIGS. 1 and 3 through 6. The base 2 has a generally rectangular configuration, when viewed from the top or bottom, and it constitutes a platform upon which the batteries of the electrical system may be seated. The base 2 has longitudinal reinforcing ribs 5 of varying length on its under side. Battery supporting ridges 6 are positioned longitudinally along the upper surface of the base 2 and are bisected by a crosswise strengthening rib 7 located medial the ends of the base 2. As seen in FIG. 3, the strengthening rib 7 begins at one side of the base 2 and slopes upward toward the opposite side, until it merges with an upstanding mounting pier 8. The pier 8 rises upwardly above the level of the rib 7 with an inboard segment 9 that has an inward directed face 10 and is located directly over the floor of the base 2. The pier 8 also has an outboard segment 11 overhanging beyond the floor of the base 2.

The base 2 also includes a shroud 12, that extends upward from the margin of the side at which the pier 8 is located. This shroud 12 is relatively thin, as seen in FIGS. 1, 2, 3 and 4, so as not to materially reduce the floor space available for the batteries of the electrical circuit. The shroud 12 also merges with the pier 8 and rises to a level above the pier 8 to form a demarcation between said inboard and outboard pier segments 9, 11.

The outboard segment 11 of the pier 8 has planar side surfaces 13 which face toward the ends of the base 2, an arched upper surface 14 spanning said side surfaces and a flat, vertical mounting face 15. A ridge 16 along the outer edge of the outboard pier segment 11 forms a part of the mounting face 15, and also with the shroud 12 forms a channel 17 as a part of the outboard pier segment 11. A through bolt 18 passes through a cylindrical bore 19 in the pier 8, as particularly shown in FIG. 3, with the headed end of the bolt adjacent the inboard pier face 10. The opposite end of the bolt 18 protrudes through the mounting face 15, and together the pier 8 and through bolt 18 serve as the main supporting connection for attachment of the base 2 to a barricade 20. The barricade 20 may be either an A-frame structure, as partially shown in FIG. 1, or it may be a larger structure composed of wooden beams. As depicted in FIG. 3, the protruding end of the through bolt 18 fits through an aperture in the barricade 20 and a mounting nut 21 completes the attachment. A mounting nut cup 22 is disposed on the through bolt 18 and closely surrounds the mounting nut 21 to prevent placement of a standard wrench on the nut 21.

The ends of the base 2 have unique shapes for cooperating with the casing 3. One end terminates in a pair of outwardly projecting lugs 23 that form pivot points about which the casing 3 can be pivoted. The underside of the opposite end of the base 2 has an integrally formed depending node 24 having at its outward end a bore 25 internally threaded for receiving a locking screw 26 that secures the casing 3 to the base 2.

As shown in FIG. 2, the casing 3 is a rectangular shaped enclosure with an open bottom 27, and the lens and lamp assembly 4 rest upon and project above the casing 3. A casing end wall 28, see FIG. 4, has two connector slots 29 in its lower end, into which the base lugs 23 may be inserted. A side wall 30 of the casing 3 has an arcuate notch 31 conforming quite closely to the configuration of the channel 17 of the pier 8. A second end wall 32 has a circular recess 33 surrounding a screw aperture 34 that receives a screw head 35 of the locking screw 26. The entire screw head 35 is substantially sunken within the recess 33 when the screw 26 is turned into its fully homed position.

To mount the housing 1 on the barricade 20, the base 2 must first be securely affixed to the barricade 20. This is accomplished by the use of the through bolt 18 which is positioned through both the pier 8 of the base 2 and the aperture in barricade 20 in such manner that the headed end of the bolt 18 is adjacent the inboard pier face 10. The cup 22 and the mounting nut 21 are then placed on the opposite end of the bolt 18 that protrudes through the aperture in barricade 20, which bolt 18 is then rotatably screwed into the mounting nut 21 as shown in FIG. 3. The mounting nut 21 is surrounded closely by the cup 22. A special tool must be used to hold the mounting nut 21 from turning inside the cup 22, as the bolt 18 is screwed into the nut 21 to securely fasten the base 2 to the barricade 20. This provides a relatively thief proof attachment because without the special tool required to hold the mounting nut 21 from rotating as the through bolt 18 is turned, it is extremely difficult for anyone to remove the base 2. It is not possible for one to merely rotate the base sufficiently to loosen the mounting nut 21 because struts (not shown) which connect the ends of the barricade 20 together are positioned below and to the sides of the base, directly impeding any substantial rotational movement of the base 2.

This method of attaching the base 2 to the barricade 20 is not the only method that can be used for attachment. Another method of attachment, that is not shown in the drawings, but which works equally well, is to insert the through bolt 18 through the aperture in the barricade 20 and then through the pier 8 of the base 2. In this way, the headed end of the bolt 18 is positioned adjacent the barricade 20, and the opposite end of the bolt 18 protrudes from the inboard pier face 10. A type of jam means can then be placed on the opposite end of

the bolt 18 to secure the base 2 to the barricade 20 in such manner that the jam means could not be removed from the bolt 18 by simply turning the headed end of the bolt 18. The jam means can consist of a mounting nut 21 that is screwed tightly on and then welded to the bolt 18, or the jam means could consist of a pair of jam nuts, the use of which is well known in the art, and need not be described here.

Although both of the above described methods of connecting the base 2 to the barricade 20 are relatively easy to perform, the present invention was designed to allow the base 2 to be left permanently attached to the barricade 20, facilitating installation and removal of the casing 3 with the electrical components inside. When the casing 3 is desired to be installed on the base 2 to complete the mounting of the housing 1 on the barricade 20, this installation is accomplished by placing the open bottom 27 of the casing 3 over and around the base 2. However, the casing 3 may not simply be lowered straight down on the base 2 since the lugs 23 make the base 2 slightly longer than the open bottom 27. The casing 3 must be tilted with respect to the base 2 so that the lugs 23 may be slid into the connector slots 29. The tilt of casing 3 must be sustantial to allow the side wall 30 to clear the pier 8 as the connector slots 29 receive the lugs 23. When the lugs 23 are fully positioned in the slots 29, casing 3 may be pivoted downward over the base 2 with the arcuate notch 31 conforming with the channel 17 in the pier 8. To permit this pivotal movement the arcuate notch 31 must be somewhat larger than the channel 17 since the notch 31 and the pier 8 are at an angle to each other as the pier 8 moves into the opening of the notch 31. In order to make the notch 31 no bigger than is necessary to have it accept the pier 8, the side of the notch 31 away from the lugs 23 is slightly bowed, as shown in FIG. 2, to provide more clearance between the channel 17 and the notch 31 during the pivotal movement.

Upon fitting the casing 3 over the base 2, the locking screw 26 may then be screwed through the screw aperture 34 into the screw bore 25 of the node 24 to lock the base 2 and the casing 3 together. Again, a special tool is required for this operation because of the sunken, homed position of the screw head 35. In this locked position, the shroud 12 acts to overlap any clearance between the side wall 30 and the channel 17 to substantially form a weather proof enclosure.

In addition to sealing the inner portion of the housing 1 from the weather, the shroud 12 also serves to reinforce the edge of the housing side wall 30 that forms the notch 31. In like manner, the ridge 16 also serves this purpose as well as shielding the clearance between the casing 3 and the channel 17 from prying instruments being wedged between the side wall 30 and the pier 8.

The pier 8 strengthens both the shroud 12 and the ridge 16, and provides a strong mounting connection for mounting the base 2 to the barricade 20. Due to the cantilever mounting of the base 2 upon which the batteries of the electrical circuit rest, the structure of the pier 8 is vital in providing the necessary support to overcome the downward torque that is developed when the light housing 1 hangs from a barricade.

The pivotal connections of the base 2 and the casing 3 formed by the lugs 23 and the slots 29 allow the housing 1 to be rapidly assembled at a barricade site and eliminate small parts that could easily be lost. Nevertheless, said pivotal connections in conjunction with the locking screw 26 securely hold the casing 3 on the base 2 to make the housing 1 relatively tamper proof. Thus, it can readily be seen that the disclosed structure provides a housing for an electric warning light that is durable and relatively thief resistant and yet is easily installed or removed by authorized personnel.

We claim:

1. In a housing for a warning light the combination comprising:
- a cantilever base presenting a supporting platform;
- an upstanding pier on said base with an inboard face and an exterior mounting face;
- a through bolt having a headed end an an opposite end, and directed through said pier for securing the cantilever base to an object;
- a mounting nut disposed on the opposite end of said through bolt; and
- a removable casing fitting over said base with a pivoted connection at one end thereof, said casing having a side wall with a notch of a configuration substantially mating with said pier, fitting over the pier as the casing is swung about said pivoted connection.

2. The combination of claim 1 in which the cantilever base comprises:
- a rectangular plate with a pair of extending lugs on one end and a node with a screw bore projecting from the underside of the opposite end;
- an upstanding pier having an inboard segment overlying a central portion of the plate and an outboard segment defining rising side surfaces facing towards the ends of the base, an arched upper surface spanning the side surfaces and a mounting face directed to the side of said base;
- a strengthening rib transversely positioned atop of said base, overlying the remaining central portion of the plate in line with the upstanding pier and merging with said pier;
- a vertical shroud rising from said base along the edge of the side at which said pier is located, and which merges with the pier as a demarcation between said inboard and outboard pier segments.

3. The combination of claim 1 in which the removable casing comprises a rectangular shaped enclosure having:
- an end wall with connector slots formed to slidably receive the projecting lugs of said base;
- a second end wall with a screw aperture surrounded by a circular recess;
- a side wall with an arcuate notch of a configuration which substantially conforms to said pier of the base; and
- an open bottom of a size to accept said base.

4. In a housing for a warning light the combination comprising:
- a cantilever base presenting a supporting platform and having:
  - an upstanding pier located substantially medial the ends and at one side of the base, which pier has an inboard segment which has an inboard face and overlies a portion of the base, an overhanging outboard segment with rising side surfaces

facing toward the ends of the platform, an arched upper surface spanning the side surfaces, and a mounting face directed to the side of said base;

a vertical shroud rising from said base along the edge of the side at which said pier is located, and which merges with the pier as a demarcation between said inboard and outboard pier segments;

a ridge that extends from said side and upper surfaces of said pier and that forms a channel between the ridge and said shroud;

a through bolt passing through said pier with a headed end at said inboard face of the pier, and an opposite end that protrudes from said mounting face;

a mounting nut on said opposite end of said bolt that protrudes from said mounting face;

a cup on said bolt that closely surrounds said mounting nut; and

a removable casing fitting over said base with a pivoted connection at one end of the base, said casing having a side wall with an arcuate notch, of a configuration substantially mating said side and arched surfaces of said pier, fitting over the pier as the casing is swung about said pivoted connection.

5. In a housing for a warning light the combination comprising:

a cantilever base presenting a platform for supporting electric circuit components and having:

a thin, vertical shroud rising from the platform along one side of the base, and

a pier rising upward from the platform at the same side of the base at which said shroud is located, which pier merges with the shroud and presents a mounting face outboard of the shroud;

an elongate mounting member protruding outward from said mounting face for securing the cantilever base to an object; and

a removable casing that fits over said base and around the outside of the shroud, said casing also having a notch that mates with said pier and which allows said mounting face to protrude from the housing.

6. In a housing for a warning light the combination comprising:

a base presenting a platform for supporting electric circuit components;

an upstanding pier located at one side of the base which has an inboard portion overlying and rising upward from the base, an outboard portion overhanging from the base which presents an outwardly facing mounting surface, and a channel in said outboard portion;

mounting means extending from the pier for securing the base to an object; and

a casing fitting over said base which rises above the base to provide a substantial enclosed space above said platform, such casing surrounding and extending below the peripheral edges of said base, and having a notch in a side wall thereof that mates with and has the notch periphery fit within said channel.

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