

[54] **POWER-PAD UNIT FOR LUMINAIRES**
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[51] Int. Cl. **H02b 1/04**

[58] Field of Search **174/52 R; 240/25; 317/99, 101 R, 101 D, 101 DH, 120**

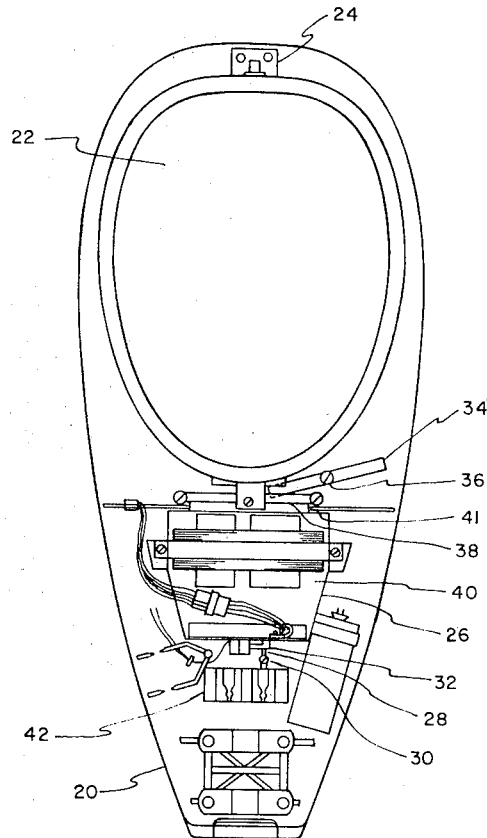
[57] **ABSTRACT**

A removable power pad is disclosed for use in supporting critical power components of a luminaire such as ballasts and capacitors. Plug and socket connectors are used to complete connections between the power pad and the power supply. A safety lock is provided to hold the power pad in place in the luminaire so that it will not fall out prematurely and injure a workman after a primary latch is released.

[56] **References Cited**
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6 Claims, 6 Drawing Figures



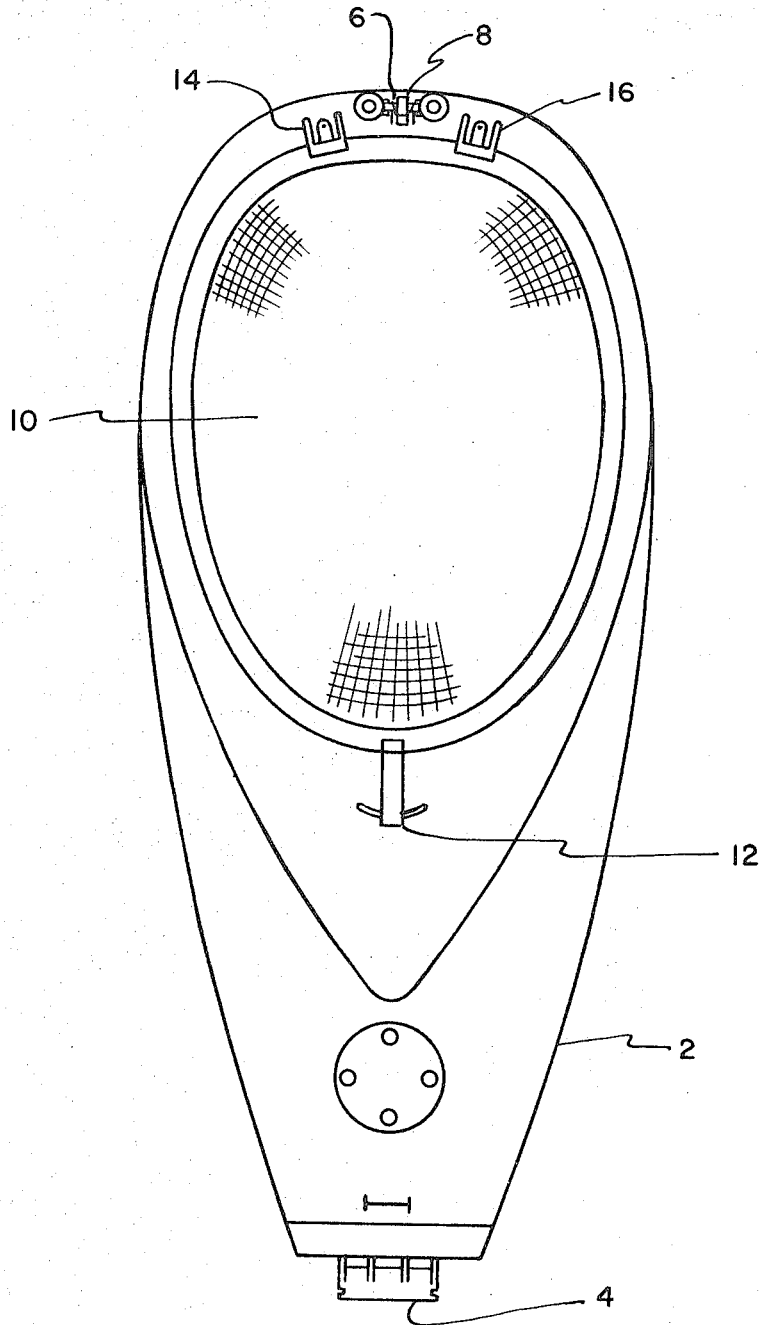


FIG. 1

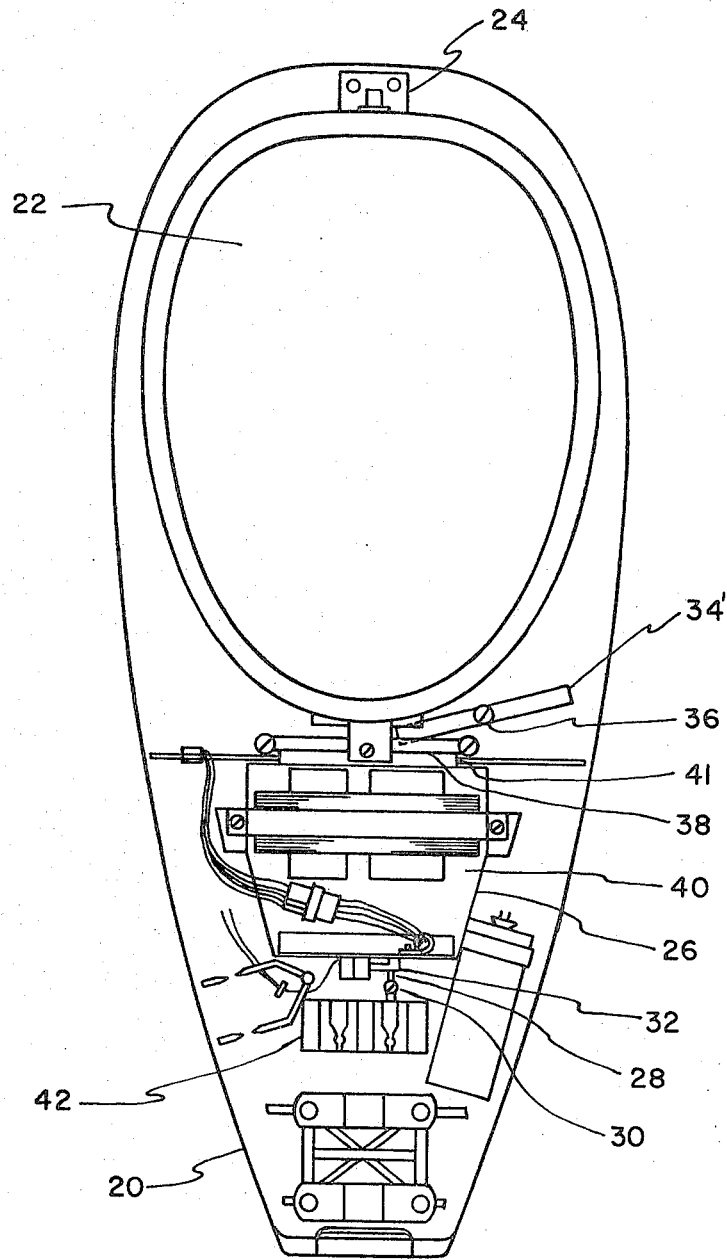


FIG. 2

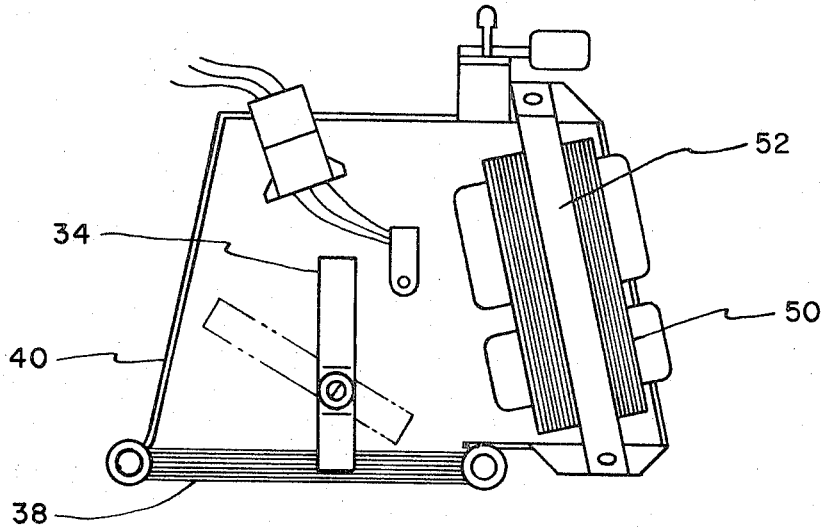


FIG. 3

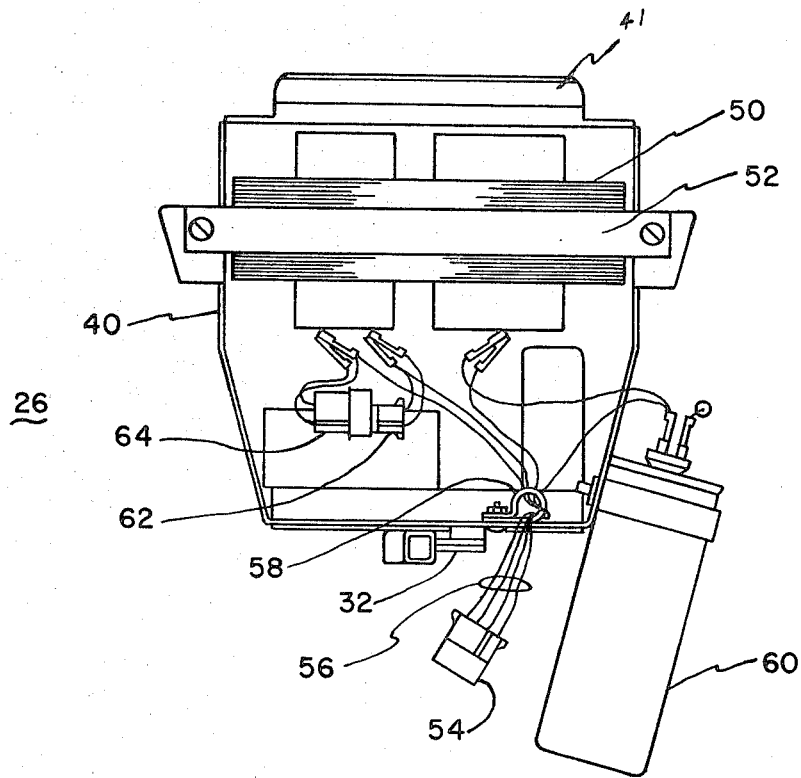


FIG. 4

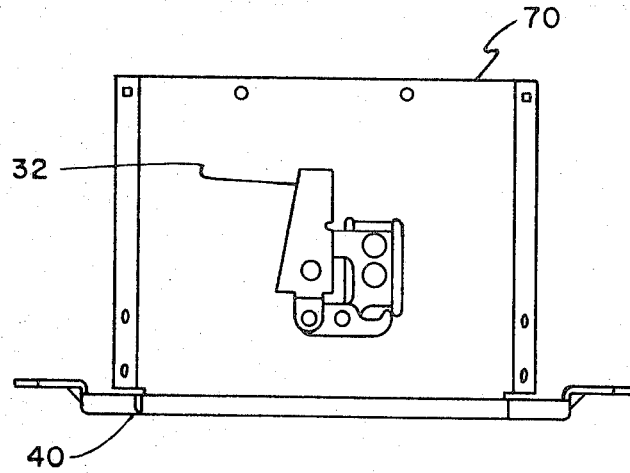


FIG. 5

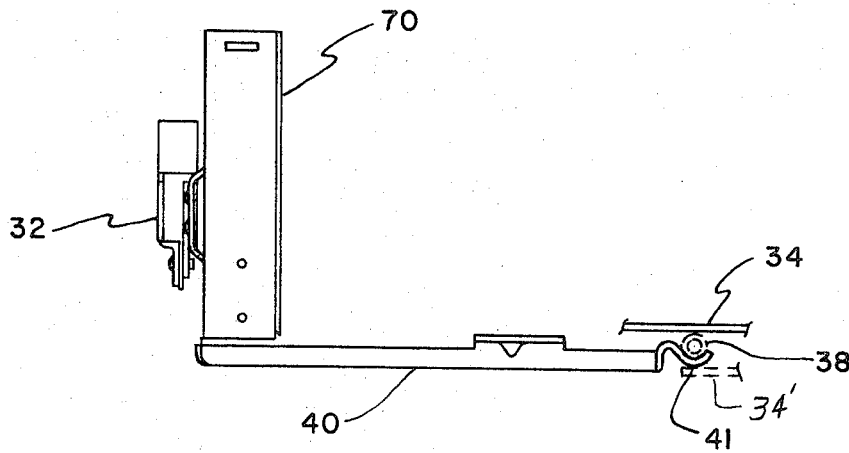


FIG. 6

POWER-PAD UNIT FOR LUMINAIRES**BACKGROUND OF THE INVENTION****1. Field of the Invention**

Power pad assemblies are disclosed for use in cooperation with luminaires of a kind generally used for outdoor illumination. The power pads and associated components are formed to permit quick and efficient assembly to and disassembly from the luminaires. Repair of disabled luminaires is thus greatly simplified. Replacement of power pads by new ones having different electrical characteristics permits conversion of the luminaires to use with lamps having different requirements of power, ballast and the like. A safety feature used in the invention relates to a safety latch to prevent injury occasioned by a sudden and unexpected fall of the power-pad when it is first released from a luminaire.

2. Description of the Prior Art

In prior art it has been a practice to fasten ballasts, sockets and other necessary electrical components for luminaires in relatively permanent ways that make their removal and replacement a relatively slow and costly process. Such electrical components have a long life and this practice was considered to be acceptable in the past from the standpoint of difficulty and cost of maintenance. Also, improvements in lamps in the past occurred at such infrequent intervals that modification of existing luminaires was rare. More recently, improvements in lamps and demands for greater illumination have become more frequent, leading to more widespread replacement of critical parts of the power assemblies in luminaires. These developments of increasing costs of maintenance and more frequent need for modification have resulted in the need for luminaires which may be repaired and modified more easily.

Devices have been proffered on the market in attempts to provide luminaires which are more accessible for repair and which may be more easily modified by changing their power assemblies. These have included luminaires in which the refractive lens assembly supports the ballast and other replacement parts. To replace damaged parts or to change lamp styles in such a luminaire it is necessary to replace the lens assembly and attached electrical components.

Other prior art constructions for luminaires have involved the use of a separate compartment for the power assembly. These constructions have employed a portion of the luminaire housing as a support for the power assembly. Replacement of power components which have been damaged or which are obsolescent requires replacement of part of the housing.

Replacement of the lens assembly and/or part of the luminaire housing at the time the ballast and other critical electrical components are replaced imposes burdens of increased cost, bulk and difficulty in handling, since major portions of the outer housing are included as replacement items. In addition, such devices have required the use of screw drivers and other tools in order to enable repairs or the completion of changeovers from one power assembly to another. The need for tools is a decided disadvantage to the installer who occupies an awkward and oftentimes hazardous position at the time changes are made.

SUMMARY OF THE INVENTION

In view of the foregoing, it is an object of the present

invention to provide an improved luminaire assembly enabling electrical components to be quickly, easily and safely replaced by repair or conversion components.

It is a further object of the invention to provide an assembly which includes necessary replacement and conversion parts for a luminaire while minimizing the number of related components which must be actually replaced.

It is yet another object to provide an improved luminaire which permits relatively unskilled labor to make repairs or replace components without using tools.

The invention relates to luminaires of use chiefly, though not exclusively, in outdoor illumination. It relates further to luminaires which are formed to receive a base plate supporting power components such as transformers and capacitors. The luminaires and the base plate include plug and socket types of electrical connectors to enable speedy connections between the power components and the power supply. A safety lock is provided to minimize the possibility that the unit will fall out and cause injury to a workman after a primary latch is released.

BRIEF DESCRIPTION OF THE DRAWINGS

The above mentioned and other features and objects of this invention and the manner of obtaining them will become more apparent, and the invention itself will be best understood by reference to the following description of an embodiment of the invention taken in conjunction with the accompanying drawings, in which:

FIG. 1 is an internal view of the lower housing assembly of a luminaire in accordance with the invention,

FIG. 2 is a view of the upper housing assembly of a luminaire showing the arrangement of components within the upper housing in accordance with the invention,

FIG. 3 is a view of a power pad assembly showing an alternative arrangement for a safety lock lever,

FIG. 4 is a top view of an exemplary base plate assembly,

FIG. 5 is an end view of the base plate showing various components attached thereto, and

FIG. 6 is a side view of FIG. 5.

DESCRIPTION OF A PREFERRED EMBODIMENT

Turning now to the drawings, FIG. 1 is seen to depict an internal view of the lower housing 2 of a luminaire. This lower housing is hinged at one end to an upper housing by means of hinge elements at 4 and is secured at the other end to the upper housing by means of a latch spring 6 in cooperation with the latch 8. The lower housing supports a refractor 10 which is held in place by a clip at 12, and by cast lugs at 14 and 16. The lower housing may be loosened at one end by disengaging the latch 6 and latch spring 8 from a latch pawl 24 (FIG. 2) to permit the housing to pivot about the hinge elements at 4 and thus expose the components held by the upper housing 20 of FIG. 2.

FIG. 2 shows the upper housing 20 of the luminaire with the lower housing removed. In this view the reflector 22 and various electrical and mechanical components are shown in positions supported by the upper housing.

The power-pad assembly at 26 involves important aspects of the present invention. This assembly is locked in place in the luminaire by hinge action and by two

latching mechanisms. The hinge action involves a hinge pin 38 which is secured to the luminaire and a hinge element 41 formed as part of a base plate 40. The hinge element 41 is placed under the hinge pin to hold one end of the base plate before the latching mechanisms are operated. The first latch mechanism involves a latch strike at 28, fastened at 30 to lock in cooperation with a latch assembly at 32. The second latch mechanism is a safety lock lever 34' which is pivoted to the upper housing 20 at 36 to enable it to extend under the hinge element 41, and in contact with said hinge element, to hold the hinge element 41 and hinge pin 38 together. The safety lock lever, in its latching position under the hinge pin 38 and hinge 41, serves to lock the base plate in the luminaire regardless of whether the latch strike 28 and the latch assembly 32 are locked or not. A terminal block assembly is indicated at 42 to which wiring (not shown) from the main power supply may be permanently connected when the luminaire is installed.

An alternative construction for use of a safety lock lever is indicated in FIG. 3. In this example, the face of the base plate 40 is relatively free of components. This permits the safety lock lever 34 (shown "open" in dashed lines and "closed" in solid lines) to be mounted on the face of the base plate so that it may be moved to the solid line position over the top of a hinge bar 38 to provide a safety lock between 38 and 41 and prevent the baseplate assembly from dropping.

It may be noted that the purpose of the safety lock lever 34 is to keep the heavy power pad assembly 26 from falling suddenly and unexpectedly and causing injury when the toggle latch formed by 28 and 32 is released. From actual testing of a model by a number of people, some of whom were very inexperienced in this kind of work, it was determined that there was a substantial risk of injury from the sudden release of the heavy power pad assembly if dependence was placed solely on the toggle latch mechanism. This was due to the sudden release of all the weight when the toggle latch was opened. It was determined that addition of a safety lock lever enabled the least experienced workmen to release the toggle latch by hand, even wearing heavy linemen's gloves, and then to support the weight of the partially released power pack assembly while safely releasing the safety lock lever.

An exemplary power pad assembly 26 is shown in greater detail in a top view in FIG. 4. In this view, a ballast unit indicated at 50 is secured to the base plate 40 by a bracket at 52. Different ballast units may be supplied according to requirements. A socket is indicated at 54, available to engage a standard mating socket (not shown) which is permanently wired to the power supply of the luminaire. In this view the socket 54 is indicated to have four circuits, but sockets having a different number of circuits may be employed without varying from the principles of the invention. The wiring at 56 is run through a cable clip at 58 to a capacitor 60 and through sockets at 62 and 64 to various electrical ballast and power consuming components (some of which are not shown). In this embodiment dual voltage units are indicated, but other units may be used as needed.

FIG. 5 is an end view of the base plate 40 showing relationships between the base plate and a bracket 70. This view corresponds to an end view of FIG. 4 with the capacitor not shown and indicates the nature of the

Bracket 70 and the way it supports the latch assembly 32.

FIG. 6 is a side view of FIG. 5 showing further relationships between the base plate 40, the bracket 70 and the latch assembly 32. In addition, this Figure includes a view of the hinge element 41 which is formed as a part of the base plate 40. The position of the hinge 41 relative to the hinge pin 38 when the base plate is installed in the upper housing of the luminaire is indicated by a dotted circle.

It will be seen from FIG. 6 that a safety lock lever in accordance with either FIG. 2 or FIG. 3 may be used to support the weight of the power pad assembly when the toggle latch is released. In the embodiment of FIG. 2, the safety lock lever 34 in operation would be supported by the upper housing of a luminaire and would fit under the hinge element 41 and the hinge pin 38 to prevent the power pad assembly from dropping. Alternatively, with the safety lock lever 34 fastened to the power pad assembly as in FIG. 3 it may be rotated to hold the hinge pin 38 between itself and the hinge element 41 and thus to cause the power pad assembly to be supported by the hinge pin 38. The safety lock lever would extend over the hinge pin 38 in its locked position to prevent the hinge element 41 from turning free of the hinge pin 38 in the construction of FIG. 3. The position of a portion of the safety lock lever is shown by solid lines at 34 in FIG. 6 to indicate more fully how the hinge pin 38 is held between 34 and 41 to provide support for 40. In the construction of FIG. 2, the safety lock lever would extend under the hinge element 41 in its locked position to prevent said hinge element from turning free of the hinge pin 38. For this construction, the position of a portion of the safety lock lever is shown by dashed lines at 34' in FIG. 6 to indicate more fully how the hinge element 41 is held between 34' and 38 to provide support for 40.

While the principles of the invention have been described above in connection with specific apparatus and applications, it is to be understood that this description is made only by way of example and not as a limitation on the scope of the invention.

I claim:

1. A removable power pad assembly for use with a luminaire comprising
 - a base plate,
 - a plurality of brackets supporting electrical components in secured relationship to said base plate,
 - a latch assembly fastened to one of said brackets, said latch assembly cooperating with said bracket and with a latch strike fastened to a luminaire to enable said base plate to be fastened to said luminaire at a first point,
 - a hinge element formed as a part of said base plate,
 - a hinge pin affixed to said luminaire, said hinge pin removably engaging said hinge element, and
 - a movable safety lock lever cooperatively rotatable about an axis to a first position in which said lever prevents disengagement of said hinge pin from said hinge element to secure the base plate to said luminaire at a second point,
 - said movable safety lock lever being rotatable to a second position to allow disengagement of said hinge pin and said hinge element and permit release of the base plate from said luminaire at said second point.

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2. A power pad assembly as claimed in claim 1, including

hand operable means in the latch assembly to enable hand latching and unlatching and enable hand assembly and disassembly of the power pad to a luminaire.

3. a power pad assembly as claimed in claim 1, in which

said safety lock lever is affixed to said luminaire to enable the base plate to be locked to said luminaire at the second point.

4. A power pad assembly as claimed in claim 1, in which

the hinge element of the base plate is enabled to fit over one side of the hinge pin, said safety lock lever is pivotably attached to the base plate, said safety lock lever is movable to engage one side

of said hinge pin and secure the hinge pin between itself and the hinge element of the base plate.

5. A power pad assembly as claimed in claim 1, in which

said safety lock lever is pivotably attached to said base plate, and said safety lock lever cooperates with said hinge element to lock said hinge pin into a position to support said base plate at said second point.

6. A power pad assembly as claimed in claim 1, in which

said hinge element and said hinge pin cooperatively engage each other and hold together in cooperation with said safety lock lever to support said base plate at said second point, where said safety lock lever is pivotably supported by said luminaire.

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