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(54) **Device for connecting an adapter for lighting apparatus to an electrified track**

Vorrichtung zum Verbinden eines Leuchtadapters an einer Stromschiene

Dispositif de connexion d'un adaptateur pour un appareil d'éclairage dans une barre conductrice

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Description

[0001] The subject of the present invention is a device for connecting an adapter for lighting apparatus to an electrified track.

[0002] As is known, installation of lighting apparatus by means of an electrified track is advantageously exploited for its characteristics of simplicity, rapidity and versatility.

[0003] The track, in fact, performs the double function of electrical connection and mechanical support for the lighting apparatus, which, usually is connected to the track by means of suitable adapters.

[0004] More in particular, two different types of devices suitable for making these installations are known.

[0005] In the first place, a single adapter is used, which serves both for the electrical connection and for the mechanical connection.

[0006] Mechanical connection is guaranteed by one or two attachments with rotating rectangular plates which rest on the side brackets of the track.

[0007] Furthermore, the horizontal faces of the adapter that rest on the external part of the track achieve the necessary countering action for partially reducing the connection play.

[0008] This first solution, has, however, the disadvantage that it involves excessive connection play which becomes more evident as the size and weight of the apparatus installed increase.

[0009] In addition, the use of the above system encounters evident limitations in the installation of heavy apparatus, as well as limitations in the installation of wall-mounted apparatus. In fact, with a track set in the vertical position, the adapter might slide along the track itself.

[0010] A second solution of the known art envisages the use of a double adapter, one first adapter guaranteeing electrical connection, and the other providing mechanical support.

[0011] As a rule, this second solution is envisaged for heavy apparatus and presents certain disadvantages due, in the first place, to the need for using two connection items, and, in the second place, due to the larger overall dimensions of the track.

[0012] Document US-A-4190309 discloses and adapter for connecting a lighting apparatus to an electrified track comprising an attachment bracket associated to a nut, or threaded cap, manoeuvrable from outside. The bracket further has a substantially rectangular cross bar provided with conical contacts, each receiving an insulated wire and engaging conductor strips recessed in the track, the track being provided with shoulders which overhang the edges of the recessed conductor strips. Upon tightening the cap, the conical contacts will be placed into firm contact with the conductor strips in the track.

[0013] A purpose of the present invention is therefore to provide a device for connecting an adapter for lighting apparatus to the respective electrified track which eliminates the connection play between the track and the

adapter.

[0014] Another purpose of the invention is to provide a connecting device which enables increase of the maximum vertical load that may be supported by the adapter.

[0015] A further purpose of the invention is to provide a connecting device that can be used with existing tracks, i.e., that does not involve the need to make any modifications to the latter.

[0016] These and other purposes are achieved by a device for connecting an adapter for lighting apparatus to the respective electrified track, according to Claim 1, to which the reader is referred for reasons of brevity.

[0017] Further optional characteristics of the invention are specified in the claims annexed to the present patent application.

[0018] Further purposes and advantages of the present invention will emerge clearly from the ensuing description and from the annexed drawings, which are provided purely to give an explanatory and non-limiting example, and in which:

- Figure 1 represents a view, which is partially cross-sectional along a plane perpendicular to the longitudinal axis, of an adapter for lighting apparatus, equipped with the connecting device according to the present invention;
- Figure 2 represents a view, which is partially cross-sectional along a plane parallel to the longitudinal axis, of an adapter for lighting apparatus, equipped with the connecting device according to the present invention;
- Figure 3 represents a schematic view, which is cross-sectional according to a substantially horizontal plane, of a connecting item for making a connection between an adapter and the respective track; and
- Figure 4 represents a schematic view, which is cross-sectional according to a substantially vertical plane, of a connecting item for making a connection between an adapter and the respective track.

[0019] With particular reference to the above-mentioned figures, the device for connecting an adapter for lighting apparatus to an electrified track, according to the present invention, is designated as a whole by the reference number 10.

[0020] The connecting device 10 comprises an attachment bracket 11, which has a plate-like surface 12, having a substantially rectangular shape, for engagement of an adapter 13 with the electrified track 14.

[0021] In addition, associated to the attachment bracket 11 is a manoeuvring screw 15 which enables tightening of the side brackets 16 of the track 14 between the rectangular plate 12 and the horizontal faces 17 of the adapter 13.

[0022] The attachment bracket 11 is made of a metallic material, and, in addition to the plate 12, has a hollow cylindrical collar 18.

[0023] On the bottom of the hollow cylindrical collar 18 and on the side opposite to the rectangular plate 12, a threaded hole 19 is made for fastening with the manoeuvring screw 15.

[0024] A countering compression spring 20 is housed inside the hollow cylindrical collar 18.

[0025] The rectangular plate 12 is shaped with appropriate radiused side edges 31 and 32 in such a way that its rotation inside the track is free until the longer side 21 of the plate is set perpendicular to the direction of the track 14, and the plate is blocked in this position by the side walls 22 of the track 14 itself.

[0026] The length of the shorter side 23 of the rectangular plate 12 is such as to enable its insertion in the track 14, whilst the length of the longer side 21 is such as to guarantee its connection with the side brackets 25 of the track 14.

[0027] In Figure 3, the arrow F indicates the direction of rotation of the attachment bracket 11.

[0028] The manoeuvring screw 15 is housed in an appropriate hole 26 made in the cover 27 of the adapter 13.

[0029] The threaded fit between the manoeuvring screw 15 and the attachment bracket 11 enables the latter, once its rotation inside the track 13 is inhibited, to translate in the vertical direction, so tightening the side brackets 25 of the track 14 between the rectangular plate 12 and the horizontal faces 17 of the adapter 13.

[0030] In Figure 4, the arrow G indicates the direction of the translation of the attachment bracket 11.

[0031] A self-locking nut 28 is mounted on the manoeuvring screw 15 on the outer side of the attachment bracket 11 to perform the function of limit stop and to prevent complete unscrewing of the manoeuvring screw 15.

[0032] The countering helical spring 20 is mounted coaxially to the manoeuvring screw 15 inside the collar 18 of the attachment bracket 11 and acts between the bottom of the latter and the horizontal face 17 of the adapter 13.

[0033] This enables the head 30 of the manoeuvring screw 15 to be kept constantly a detent, and the attachment bracket 11 to be kept as raised as possible from the horizontal faces 17 of the adapter 13, as far as this is compatible with the position imposed by the threaded fit.

[0034] This feature facilitates insertion of the adapter 13 in the track 14.

[0035] According to a preferred variant of the present invention, the head 30 of the manoeuvring screw 15 may be replaced by a knob (not illustrated), which enables manoeuvrability of the screw by hand in the phase of attachment of the apparatus to the track 14.

[0036] The possibility of completing tightening of the screw with the use of tools is in any case guaranteed by an appropriate groove or slot made in the knob itself.

[0037] According to another preferred variant of the present invention, the countering spring 20 can also be used as a torsional spring between the attachment bracket 11 and the adapter 13, in such a way that the rectan-

gular plate 12 is in the working position, i.e., it is with its longer side 21 perpendicular to the direction of the track 14 when the spring 20 is in the resting position.

[0038] Consequently, by acting on the manoeuvring screw 15 for the insertion of the adapter 13 in the track 14, the spring 20 is loaded, which, when the manoeuvring screw 15 is released, immediately positions the rectangular plate 12, which guarantees self-support of the apparatus.

[0039] This feature is obtained by means of two small detent teeth 33 and 34 for the ends of the spring 20, in particular the tooth 34 being on the face of the adapter 13, and the tooth 33 being on the attachment bracket 11.

[0040] A third detent tooth 29 must be made on the adapter 13 to limit rotation of the bracket 11 to less than 360°.

[0041] This has the function of preventing the bracket 11 from losing the pre-loading applied on it by the spring 20 and enables correct positioning of the bracket in the phase of insertion of the adapter 13 in the track 14.

[0042] A circular relief which is concentric with the hole for the manoeuvring screw 15 keeps the spring 20 in position.

[0043] The characteristics of the device for connecting an adapter for lighting apparatus to the respective electrified track, which forms the subject of the present invention, emerge clearly from the foregoing description, as do the advantages, among which, particular mention should be made of the wider possibilities of wall-mounted installation that are afforded by the device 10.

[0044] Finally, it is clear that numerous variations may be made to the connecting device which forms the subject of the present invention without thereby departing from the scope of the claims.

[0045] Finally, in the practical implementation of the invention, the materials, shapes and dimensions of the items illustrated may be any whatsoever according to the requirements, and the said items may be replaced with others that are technically equivalent without departing from the scope of the claims.

Claims

1. A device (10) for connecting an adapter (13) for a lighting apparatus to an electrified track (14), **characterized in that** it comprises an attachment bracket (11) associated to a screw (15) manoeuvrable from outside, the attachment bracket (11) having a substantially rectangular plate-like surface (12) for engagement with said track (14), and to the attachment bracket (11) there being associated said manoeuvring screw (15) which enables tightening of the side brackets (25) of said track (14) between said plate (11) and the horizontal faces (17) of the adapter (13).
2. A device (10) as per Claim 1, **characterized in that** the above-mentioned attachment bracket (11) has a

hollow cylindrical collar (18), on the bottom of which and on the opposite side with respect to the said plate (12) a threaded hole (19) is made for connection with the said manoeuvring screw (15).

3. A device (10) as per Claim 2, **characterized in that** the said manoeuvring screw (15) is housed in a corresponding hole (26) made in the cover (27) of the adapter (13).
4. A device (10) as per Claim 2, **characterized in that** it is provided with a countering spring (20) mounted coaxially to the said manoeuvring screw (15) inside the cylindrical collar (18) of the attachment bracket (11), the said countering spring (20) acting between the bottom of the said hollow cylindrical collar (18) and the horizontal faces (17) of the adapter (13).
5. A device (10) as per Claim 4, **characterized in that** it is provided with two detent teeth (33, 34) for the ends of the said spring (20), one tooth (34) being set on the face of the adapter (13), and the other (33) being set on the attachment bracket (11), in such a way that the aforesaid countering spring (20) can be used as a torsional spring between the attachment bracket (11) and the said adapter (13), so that the plate (12) is in the working position when the spring (20) is in the resting position.
6. A device (10) as per Claim 5, **characterized in that** a third detent tooth (29) is made on the adapter (13) to limit rotation of the bracket to less than 360°, whilst a circular relief which is concentric to the hole for the manoeuvring screw (13) keeps the spring (20) in position.
7. A device (10) as per Claim 1, **characterized in that** the said rectangular plate (12) is shaped in such a way that its rotation inside the track (14) is free until the longer side (21) of the plate is set perpendicular to the direction of the track (14), and the plate is blocked in this position by the side walls (22) of the track (14) itself.
8. A device (10) as per Claim 1, **characterized in that** it is provided with a self-locking nut (28) mounted on the said manoeuvring screw (15) on the outer side of the attachment bracket (11) to perform the function of limit stop and prevent complete unscrewing of the said manoeuvring screw (15).
9. A device (10) as per Claim 1, **characterized in that** the said plate-like surface (12) belonging to the attachment bracket (11) has a substantially rectangular shape.

Patentansprüche

1. Vorrichtung (10) zum Verbinden eines Adapters (13) für eine Leuchteinrichtung mit einer Stromschiene (14), **dadurch gekennzeichnet, dass** diese einen mit einer von außen betätigbaren Schraube (15) verbundenen Anschlussträger (11) umfasst, wobei der Anschlussträger (11) eine im Wesentlichen rechteckige, plattenartige Fläche (12) zum Eingreifen in die Stromschiene (14) hat, und wobei die mit dem Anschlussträger (11) verbundene Betätigungsschraube (15) ein Klemmen der Seitenträger (25) der Stromschiene (14) zwischen der Platte (11) und den horizontalen Flächen (17) des Adapters (13) ermöglicht.
2. Vorrichtung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** der Anschlussträger (11) eine hohle zylindrische Manschette (18) hat, wobei auf deren Boden und auf der gegenüberliegenden Seite bezüglich der Platte (12) ein Gewindeloch (19) zum Verbinden mit der Betätigungsschraube (15) ausgebildet ist.
3. Vorrichtung (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** die Betätigungsschraube (15) in einem in der Abdeckung (27) des Adapters (13) ausgebildeten entsprechenden Loch (26) aufgenommen ist.
4. Vorrichtung (10) nach Anspruch 2, **dadurch gekennzeichnet, dass** in der zylindrischen Manschette (18) des Anschlussträgers (11) eine koaxial zur Betätigungsschraube (15) montierte gegenwirkende Feder (20) vorgesehen ist, wobei die gegenwirkende Feder (20) zwischen dem Boden der hohlen zylindrischen Manschette (18) und den horizontalen Flächen (17) des Adapters (13) wirkt.
5. Vorrichtung (10) nach Anspruch 4, **dadurch gekennzeichnet, dass** zwei Rastzähne (33, 34) für die Enden der Feder (20) vorgesehen sind, wobei ein Zahn (34) auf der Fläche des Adapters (13) und der andere (33) auf dem Anschlussträger (11) derart angeordnet sind, dass die gegenwirkende Feder (20) als Torsionsfeder zwischen dem Anschlussträger (11) und dem Adapter (13) verwendbar ist, so dass die Platte (12) in der Arbeitsposition ist, wenn die Feder (20) in der Ruheposition ist.
6. Vorrichtung (10) nach Anspruch 5, **dadurch gekennzeichnet, dass** auf dem Adapter (13) ein dritter Zahn (29) ausgebildet ist, um eine Rotation des Trägers auf weniger als 360° einzuschränken, wobei die Feder (20) mit einem zum Loch für die Betätigungsschraube (13) konzentrischen Profil in Position gehalten wird.

7. Vorrichtung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** die rechteckige Platte (12) derart geformt ist, dass diese in der Stromschiene (14) frei rotierbar ist, bis die längere Seite (21) der Platte senkrecht zur Richtung der Schiene (14) ist, und dass die Platte in dieser Position durch die Seitenwände (22) der Schiene (14) selbst blockiert wird.
8. Vorrichtung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** eine selbstsichernde Mutter (28) vorgesehen ist, welche auf der äußeren Seite des Anschlussträgers (11) auf der Betätigungsschraube (15) angebracht ist, und welche die Funktion eines Anschlags hat und ein vollständiges Herauserschrauben der Betätigungsschraube (15) verhindert.
9. Vorrichtung (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** die zum Anschlussträger (11) zugehörige plattenartige Fläche (12) eine im Wesentlichen rechteckige Form hat.

Revendications

1. Dispositif (10) pour connecter un adaptateur (13) destiné à un dispositif d'éclairage pour une rampe électrifiée (14), **caractérisé en ce qu'il** comporte un support de fixation (11) associé à une vis (15) pouvant être manoeuvrée à partir de l'extérieur, le support de fixation (11) ayant une surface analogue à une plaque essentiellement rectangulaire (12) pour un engagement avec ladite rampe (14), et au support de fixation (11) est associée ladite vis de manoeuvre (15) qui permet de serrer les supports latéraux (25) de ladite rampe (14) entre ladite plaque (12) et les surfaces horizontales (17) de l'adaptateur (13).
2. Dispositif (10) selon la revendication 1, **caractérisé en ce que** le support de fixation mentionné ci-dessus (11) comporte un collier cylindrique creux (18), sur le fond duquel et sur le côté opposé par rapport à ladite plaque (12) un trou taraudé (19) est formé en vue d'une connexion avec ladite vis de manoeuvre (15).
3. Dispositif (10) selon la revendication 2, **caractérisé en ce que** ladite vis de manoeuvre (15) est reçue dans un trou correspondant (26) percé dans le couvercle (27) de l'adaptateur (13).
4. Dispositif (10) selon la revendication 2, **caractérisé en ce qu'il** est doté d'un ressort antagoniste (20) monté de façon coaxiale à ladite vis de manoeuvre (15) à l'intérieur du collier cylindrique (18) du support de fixation (11), ledit ressort antagoniste (20) agissant entre le fond dudit collier cylindrique creux (18) et les surfaces horizontales (17) de l'adaptateur (13).
5. Dispositif (10) selon la revendication 4, **caractérisé en ce qu'il** est pourvu de deux dents de butée (33, 34) destinées aux extrémités dudit ressort (20), une dent (34) étant posée sur la surface de l'adaptateur (13), et l'autre dent (33) étant posée sur le support de fixation (11), d'une manière telle que le ressort antagoniste susdit (20) peut être utilisé comme un ressort de torsion entre le support de fixation (11) et ledit adaptateur (13), de façon que la plaque (12) se trouve dans la position active lorsque le ressort (20) est dans la position de repos.
6. Dispositif (10) selon la revendication 5, **caractérisé en ce qu'une** troisième dent de butée (29) est formée sur l'adaptateur (13) pour limiter une rotation du support à moins de 360°, tandis qu'une partie en saillie circulaire qui est concentrique au trou destiné à la vis de manoeuvre (15) maintient le ressort (20) en position.
7. Dispositif (10) selon la revendication 1, **caractérisé en ce que** ladite plaque rectangulaire (12) est configurée de telle manière que sa rotation à l'intérieur de la rampe (14) soit libre jusqu'à ce que le côté le plus long (21) de la plaque soit placé perpendiculairement à la direction de la rampe (14), et que la plaque soit bloquée dans cette position par les parois latérales (22) de la rampe (14) elle-même.
8. Dispositif (10) selon la revendication 1, **caractérisé en ce qu'il** est doté d'un écrou autobloquant (28) monté sur ladite vis de manoeuvre (15) sur le côté extérieur du support de fixation (11) pour exécuter la fonction de butée de limitation et empêcher un dévissage total de ladite vis de manoeuvre (15).
9. Dispositif (10) selon la revendication 1, **caractérisé en ce que** ladite surface analogue à une plaque (12) appartenant au support de fixation (11) présente une forme essentiellement rectangulaire.

Fig.1

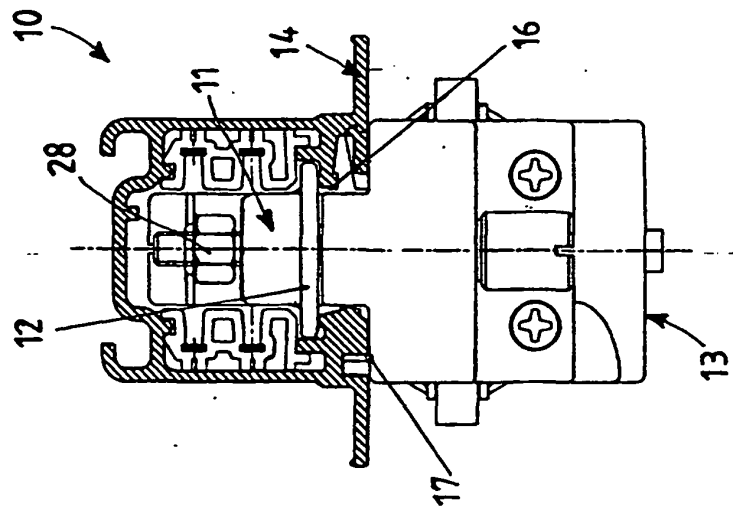


Fig.2

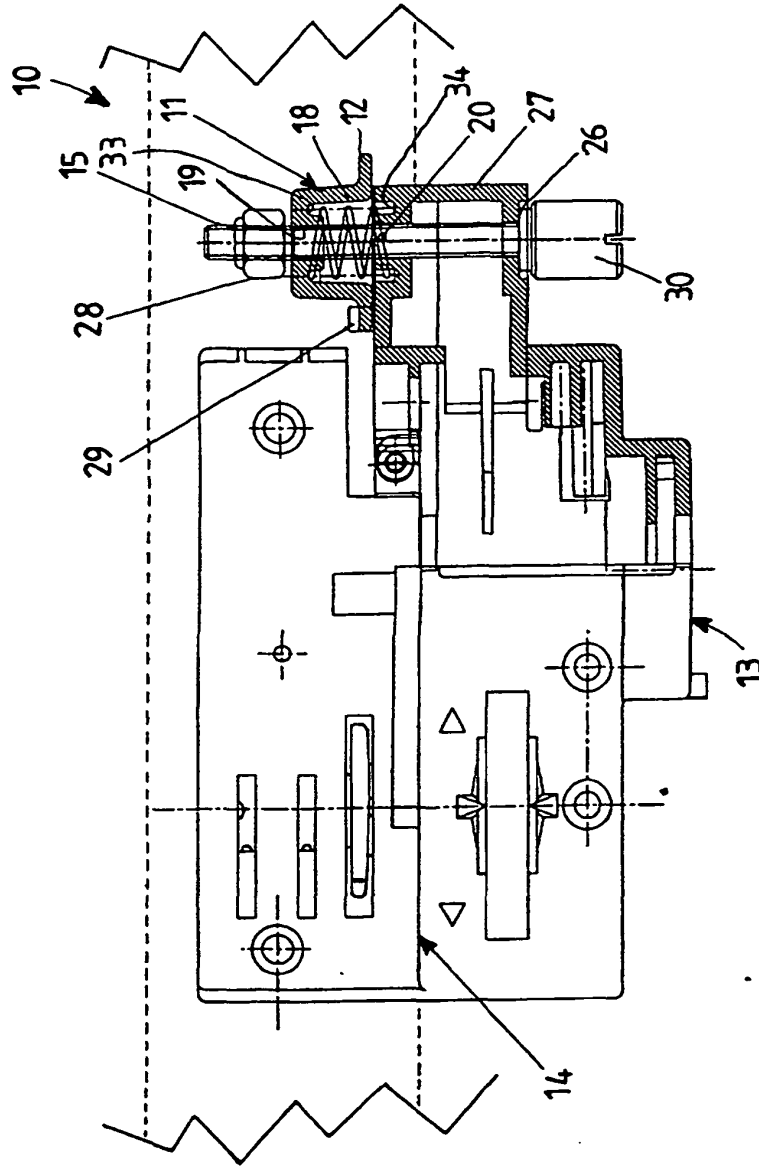


Fig.3

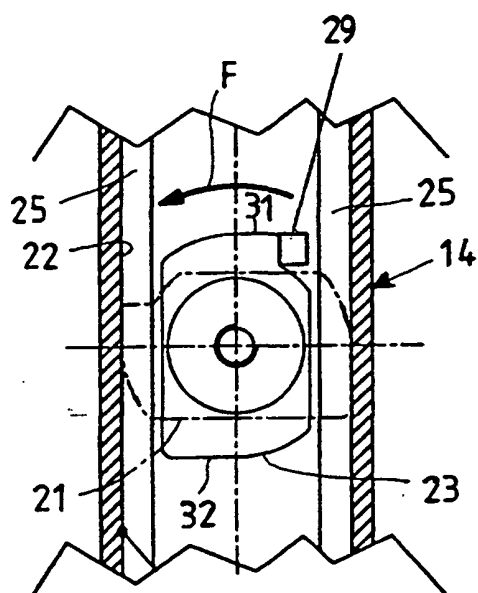


Fig.4

