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MULTIPLE CONTACT LAMP HANGER

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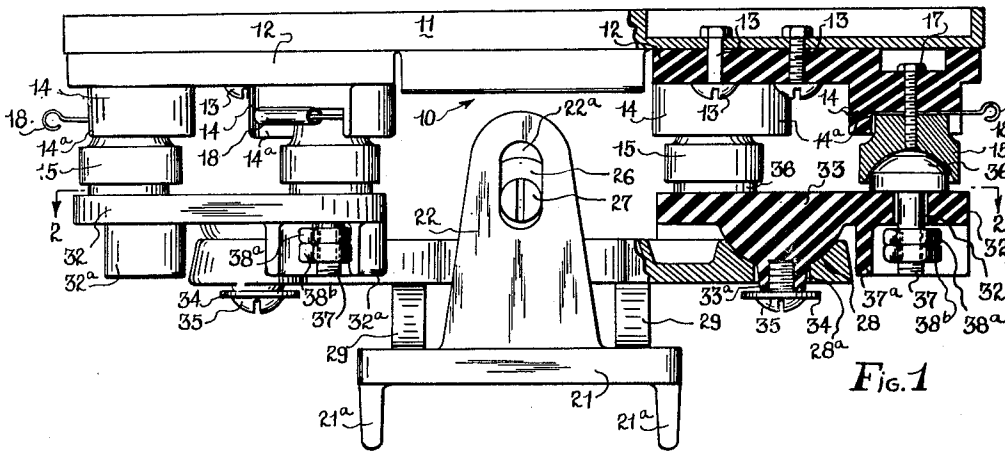


Fig. 1

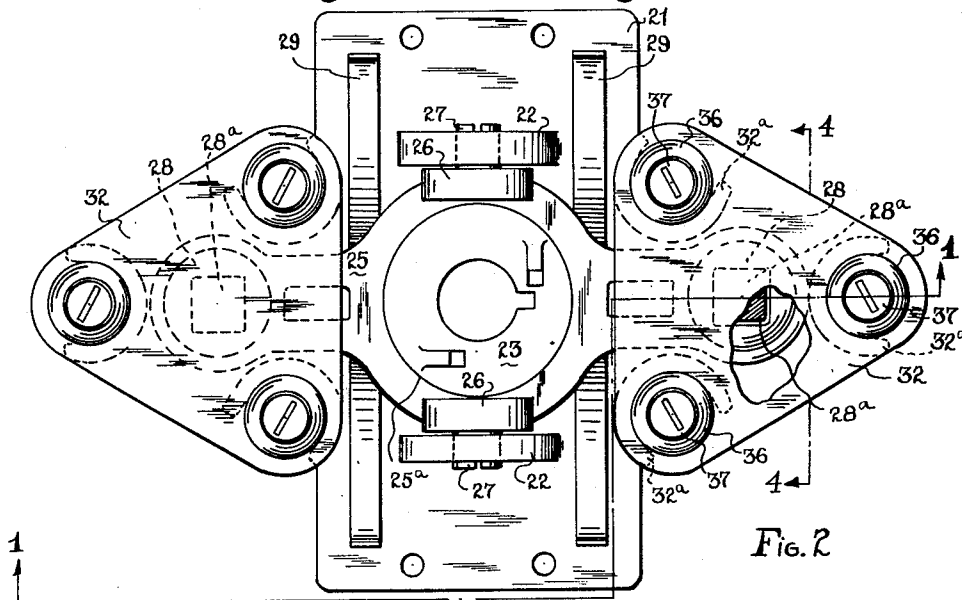


Fig. 2

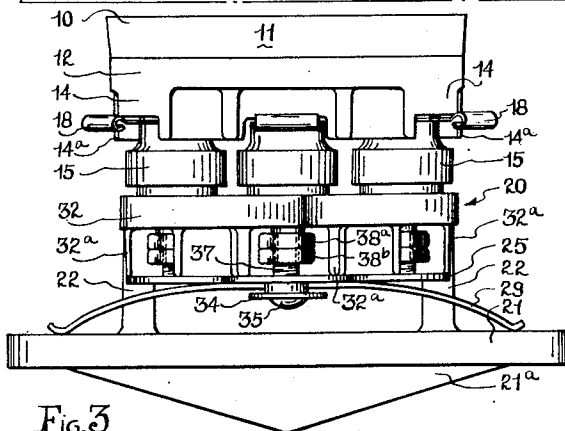


Fig. 3

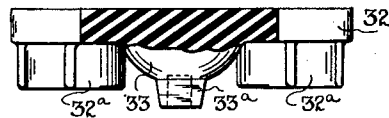


Fig. 4

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MULTIPLE CONTACT LAMP HANGER

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Application September 15, 1950, Serial No. 184,954

4 Claims. (Cl. 339-135)

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This invention relates to lamp hangers having multiple contacts and in particular to such devices having means for equalizing the pressure between the contacts.

An object of the present invention is to provide means for supporting separable contacts in a simple but efficient manner providing for the necessary adjustment of the coacting pairs of contacts when making and breaking the circuit.

In the drawings,

Fig. 1 is a side elevational view, partly in section along the line 1-1 of Fig. 2, showing an embodiment having six pairs of coacting contacts;

Fig. 2 is a sectional view on the line 2-2 of Fig. 1 and partly broken away;

Fig. 3 is an end elevation of the embodiment of Figs. 1 and 2; and

Fig. 4 is a sectional view taken on the line 4-4 of Fig. 2.

It is to be understood that although a preferred embodiment of the invention is hereinafter described in detail, the invention is not limited to such embodiment unless so defined by the appended claims. In addition, the terms and phrases used herein are merely descriptive and illustrative and are not to be construed as in any way limiting the invention.

In the present state of the illumination art, there is a definite need for lamp fixtures adapted to provide a multiplicity of circuit contacts in a single fixture. There are many applications for such fixtures in which it is necessary or desirable to have several circuits, such, for example, as in eliminating stroboscopic effects, and in step or progressive starting.

In many applications, it is necessary or desirable to mount the fixtures on the ceiling, and, when the ceiling is high, maintenance difficulties are encountered unless the fixtures can be lowered to a convenient level. The present invention is adapted for use with any one of a number of lowering devices, one of which, for example, is that described in the copending application of Thayer B. Farrington et al., Serial No. 184,686 filed September 13, 1950.

Speaking first generally, there is illustrated an embodiment of the invention having six pairs of coacting contacts. A fixed member, which is normally attached to a ceiling fixture, has six fixed contacts mounted thereon in two groups of three respectively on each side of the center. A separable element also has six contacts which coact with the six fixed contacts and are adjustably mounted with respect to each other. The

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groups of three contacts on the separable element are mounted one group at each end of a lever, pivoted intermediate its ends. Each group is mounted on the lever by a ball and socket arrangement, thereby providing means to equalize pressure between the three contacts of the group. Therefore, any irregularities in the mountings of the fixed contacts will be compensated for and firm engagement between all pairs of contacts obtained. In addition, should the separable element be tilted when drawing the two elements together, the pressure between all pairs of contacts will be equalized and no damage will result.

Referring to the drawing, the fixed member 10, which is normally secured to a ceiling fixture or other support, comprises a plate 11 to which the insulator blocks 12 are attached by bolts and nuts as at 13. Each block 12 has three downwardly projecting portions 14 to each of which is secured contact means, in this case, a cup-shaped downwardly opening contact 15, attached by a bolt 16 and nut 17. A terminal lug 18, of soldered or solderless type, to which an electrical lead may be attached, is retained on each bolt 16 between the contact 15 and the insulator projection 14, and extends outwardly from the projecting skirt 14a on each insulator portion 14. The downwardly projecting portions 14, in this embodiment, are arranged at the corners of a triangle having its base toward the center of the fixed element and at right angles to the longitudinal center line of the element. However, it is not necessary that the triangle be oriented in this or in any particular manner, and the arrangement described herein is merely for illustrative purposes and is not to be construed as limiting in any sense.

The separable element, designated generally by the numeral 20, comprises in general a bracket having a lever pivoted thereon. The bracket 21 is substantially rectangular and has two downwardly extending skirts 21a and two upstanding lugs 22, for the purpose to be hereinafter described. As previously mentioned, the present invention is adapted for use with lowering fixtures, and, therefore, fittings 23 are provided in the center portion of the bracket 21. The fittings 23, and a platform spring to be later described, act in conjunction with the lowering fixture to which the bracket is generally attached, as shown in the above mentioned copending application Serial No. 184,686, and provide guide means to produce vertical alinement of contacts 36 respectively with contacts 15, and provide latch means to connect and disconnect the fixed

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and separable portions of the fixture. Similarly functioning guide and latch means are shown in the copending application of Thayer B. Farrington et al. Serial No. 589,822 filed April 23, 1945, and since issued as U. S. Patent No. 2,564,328, August 14, 1951.

A lever 25 is pivotally mounted between the upstanding lugs 22 on the bracket 21. Two lugs 26 on the lever 25 have screws 27 threaded therein which ride in slots 22a in the lugs 22, thereby defining an axis about which the lever 25 may pivot. The central portion of the lever 25 is apertured as at 25a to provide access to the fittings 23. A cup-shape upwardly opening depression 28 is formed in each end portion of the lever 25 and will be hereinafter referred to as a socket, for descriptive purposes. In the center of each socket 28 is a non-circular aperture 28a (here shown as square) into which loosely fits a complementary projection 33a to prevent any rotation of block 33 which would carry contacts 36 out of mating engagement with contacts 15. Platform springs 29 disposed between the bracket 21 and the lever 25 on each side of the pivotal axis (defined by the screws 27) maintain the lever 25 in a substantially balanced position and also serve in conjunction with the slots 22a as part of the previously mentioned latch means.

The lever 25 carries on each end an insulator block 32, in this case, of triangular shape, which has formed on its lower surface a ball element 33 which in turn has formed on it a square projection 33a. As is obvious, the ball element 33 fits the socket 28 in the lever 25, in much the manner of the usual ball and socket joint, and the projection 33a extends through the aperture 28a which is somewhat larger than the projection to permit oscillation of the ball-and-socket joint. A retaining washer or flange 34, carried by or attached to a screw 35 which is threaded into the projection 33a, retains the spherical surface 33 in position in the socket 28 and yet allows bearing movement between the two surfaces. Contact means are carried by each insulator block 32, and, in this instance, comprise self-centering contacts 36 mounted one on each corner of each of the triangular insulator blocks 32 in position to meet and coat with a corresponding fixed contact 15. The surface of each contact 36 is substantially a spherical segment, complementary to the surface of each contact 15. A bolt 37 extends through a hole 32b under each contact 36 and the lock nuts 38a and 38b retain the bolt and contact in position. As seen in Fig. 1, the holes 32b are somewhat larger than the bolts 37, and the lock nuts 38a and 38b are not drawn tightly against the insulator blocks 32. Thus, because some movement of each individual contact 36 is allowed, the contact will "cam" into engagement with the fixed contact and center itself therein. An electrical lead may be retained between the lock nuts 38a and 38b and will be protected by downwardly extending skirts 32a.

It is a well known geometric principle that a plane is defined by three points. Applying that principle to practice, it is seen that even though the three contacts comprising each of the two fixed groups may not lie in a plane parallel to the plate 11 due, perhaps, to defects in mounting, they will all three lie in some one particular plane. Therefore, since the separable element contacts are mounted by means of the ball and socket arrangements previously described, the plane defined by the three contacts of each separable element group can be made to lie parallel

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to that defined by the fixed element group. Thus, firm contact is obtained between coating contacts of all three pairs when the fixed and separable elements are drawn together. It is apparent that this parallel plane adjusting action will take place in both groups of three contacts mounted on opposite ends of the lever 25, and, because of the pivotal mounting of the lever 25 on the screws 27, a further equalizing action will take place between the two groups. That is, should the plane defined by the three contacts of one group be higher than that defined by the other group, the lever 25 will pivot about the screws 27 to equalize pressure between coating contacts of the two groups. The platform springs 29, of course, aid in obtaining firm engagement between contacts of all mating pairs. It should be noted the ball and socket mounting need not be placed at any particular point other than within the boundaries of the triangle defined by the contacts 36. In the embodiment illustrated, the mounting is placed approximately at the center of the triangle, but this is in no sense to be construed as a limitation and the same principles of operation apply regardless of the mounting location with the triangle.

It is apparent that the present invention provides a device which will operate efficiently and which is simple in construction. Various changes may be made by one skilled in the art without departing from the spirit of the invention or the scope of the appended claims.

What we claim is:

1. Lamp hanger contact supporting means comprising bracket means, a lever having a pivotal mounting on said bracket means intermediate the ends of said lever at right angles and intermediate the longitudinal center line of said bracket, a pair of insulator blocks positioned one at each end of said lever, each end of said lever having a ball and socket connection with its associated insulator block including coating ball and socket parts on said lever and said insulator block, and three contacts carried by each said insulator block in triangular relationship on each block.

2. Lamp hanger contact supporting means comprising bracket means, a lever having a pivotal mounting on said bracket means intermediate the ends of said lever at right angles and intermediate the longitudinal center line of said bracket, a pair of insulator blocks positioned one at each end of said lever, each end of said lever having a ball and socket connection with its associated insulator block including coating ball and socket parts on said lever and said insulator block, and three contacts in triangular relationship carried by each said insulator block, said ball and socket connection being located within the triangle defined by said three contacts.

3. Lamp hanger contact supporting means for pressure coaction with two sets of complementary contacts arranged in two groups of three each, said means comprising bracket means, a lever having a pivotal mounting on said bracket means intermediate the ends of said lever at right angles and intermediate the longitudinal center line of said bracket and having an upwardly opening socket element in each end thereof, a pair of insulator blocks each having a downwardly projecting ball element thereon, each said ball element being seated in one said socket element, means for adjustably retaining each said ball element in its corresponding socket element, such means comprising a projection on each said ball

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element which extends through an aperture in said corresponding socket element and is retained therethrough by a washer on a bolt threaded into said projection, and three contacts in triangular relationship carried by each said insulator block, each said contact being mounted thereon by means of a bolt extending through its associated said block through an aperture of larger diameter than said bolt, said ball element being located within the triangle defined by said three contacts, whereby to center each contact with its coacting one, to equalize pressure between said three contacts on each said block, and three of said complementary contacts and to equalize pressure between said blocks mounted on opposite ends of said lever against said two groups of complementary contacts.

4. In the combination of a plurality of fixed electrical contacts and a plurality of movable electrical contacts adapted to mate with the fixed electrical contacts respectively, movable lamp hanger contact supporting means comprising bracket means, a lever having a pivotal mounting on said bracket means intermediate the end of said lever, a pair of insulator blocks positioned one at each end of said lever, each end of said lever having a ball and socket connection with its associated insulator block including coacting ball and socket parts on said lever and said insulator block, three contacts carried by each said insulator block and adapted to mate with coact-

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ing fixed contacts, each pair of mating contacts having coacting convex and concave mating surfaces respectively, said ball and socket connection being located within the triangle defined by said three contacts, a non-circular projection on each of said ball parts, there being a non-circular opening through each of said socket parts adapted to receive one of said non-circular projections loosely, means securing each coacting ball and socket part against separation, said loosely fitting projection and associated opening permitting insufficient movement of said movable contacts out of mating engagement with said fixed contacts, means providing approximate vertical alignment between said fixed and movable contacts, and means for retaining said mating contacts in engagement.

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