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N. A. TORNBLOM

2,431,895

CUSHIONED RECEPTACLE FOR LIGHT BULBS

Filed Dec. 19, 1945

2 Sheets-Sheet 1

Fig. 1.

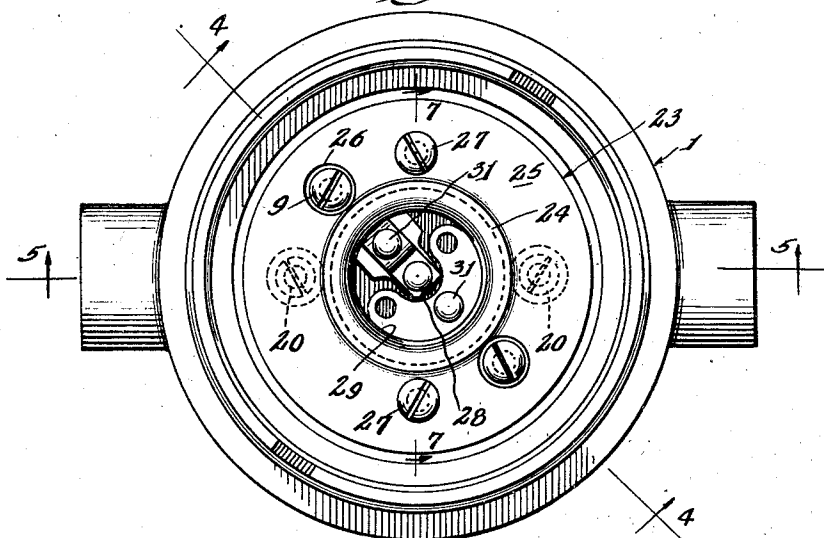


Fig. 2.

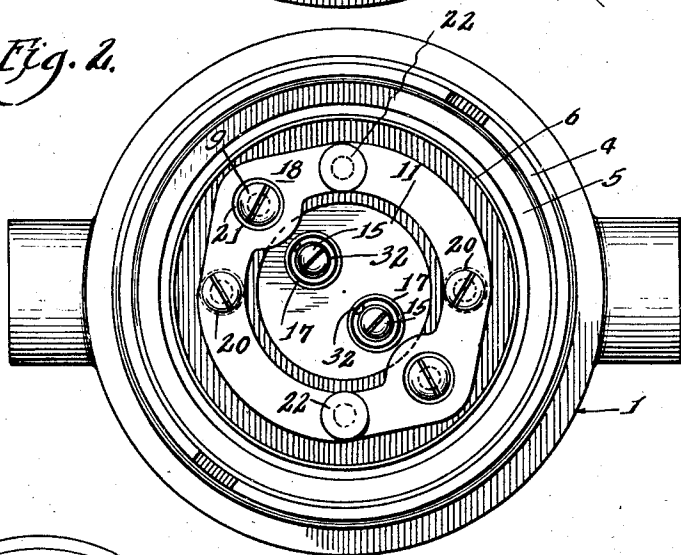
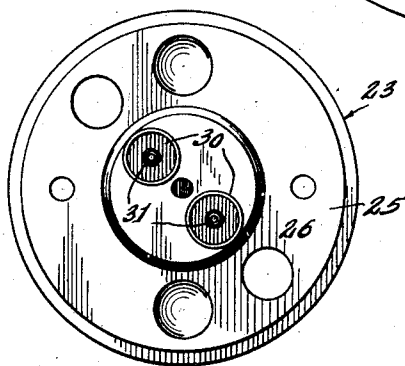


Fig. 3.



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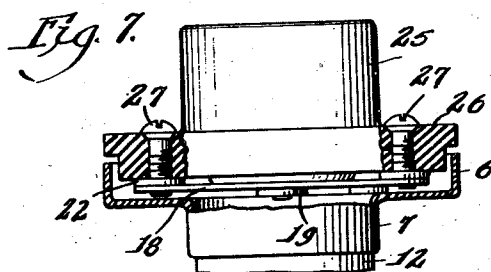
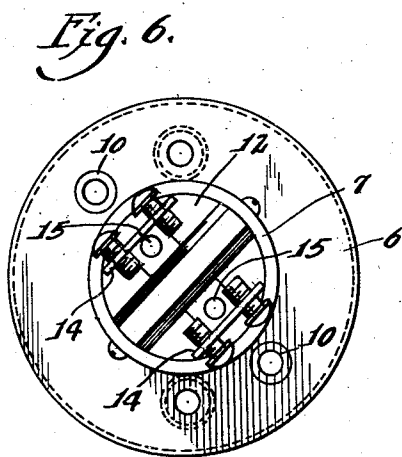
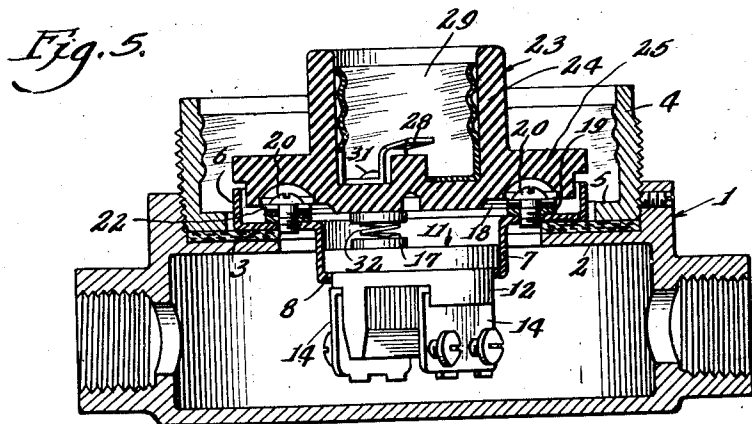
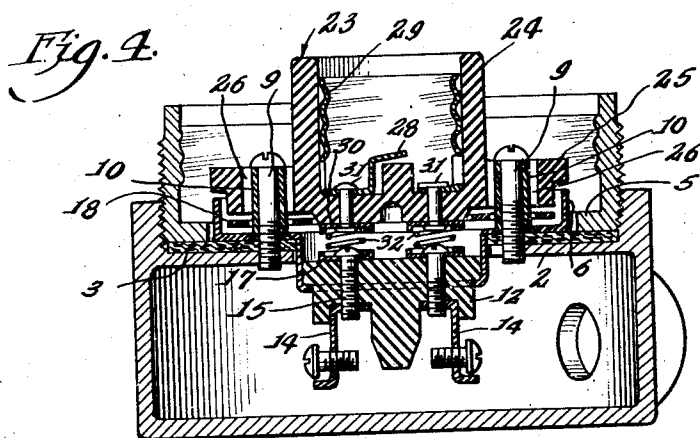
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CUSHIONED RECEPTACLE FOR LIGHT BULBS

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8 Claims. (Cl. 173-338)

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In places where light bulbs are supported by outlet boxes that, from one cause or another, are caused to vibrate to such an extent as to be harmful to the bulbs, safety for the bulbs can be attained only through providing means to cushion them against the effects of such vibration. The most common way of cushioning a bulb is to provide a resilient mounting for the receptacle which supports the bulb. Every such mounting of which I am aware has or gives rise to some fault or faults and it is the object of the present invention to eliminate such faults.

A fault usually found in prior structures is rapid deterioration of the electrically-conductive connection between the receptacles and the supports on which they are yielding mounted; and, viewed in one of its aspects, the present invention may be said to have for an object to provide a simple and novel means for insuring that such connections shall remain effective indefinitely.

In carrying out my invention, I use as connectors, between terminals through which current is supplied and terminals on a receptacle, coiled compression springs which are placed under an initial compression when the receptacle is attached to its immediate support. Therefore, viewed in another aspect, the present invention may be said to have for an object to make it possible to complete the electrical connections to a receptacle through the mere act of securing the receptacle in its working position.

The coiled springs are preferably so arranged that they yieldingly support the receptacle along an axis that crosses the principal axis about which the main cushioning means permits it to rock; thereby giving aid to the main cushioning means in absorbing forces tending to vibrate the receptacle.

Therefore, in another aspect of my invention, it may be said to have for its object to provide a receptacle with a novel cushioning means that includes as a part thereof efficient current-carrying elements in the form of compression springs that provide a cushioning effect which modifies the effect produced by a main cushioning means in a manner to achieve a more balanced restraining action on the receptacle.

The various features of novelty whereby the present invention is characterized will hereinafter be pointed out with particularity in the appended claims; but, for a full understanding of the invention and of its objects and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawings, wherein:

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Figure 1 is a top plan view of a round outlet box equipped with bulb-supporting means embodying the present invention; Fig. 2 is a view similar to Fig. 1, with the receptacle removed; Fig. 3 is a bottom view of the receptacle detached from the box; Figs. 4 and 5 are sections taken, respectively, on lines 4-4 and 5-5 of Fig. 1; Fig. 6 is a bottom plan view of the receptacle and the supporting means therefor that can be installed in or removed from the box as a unit; and Fig. 7 is a view of a portion of the unit appearing in Fig. 6, partly in side elevation and partly in section, the plane of the section being indicated by line 7-7 of Fig. 1.

In the drawings, 1 is any usual or suitable outlet box, shown as being of cylindrical shape. The box is open at the top, (or the bottom when turned upside down, in use), and has a wide, internal, annular flange 2 a short distance below the upper edge thereof. On this flange lies a flat ring or washer 3 of cork or other suitable cushioning material. The washer is held in place by a cup-shaped member 4 screwed into the top of the box and having the bottom cut away except for a narrow row flange 5 along the lower end of the cylindrical wall of the cup. Resting on washer 3 is a pan-shaped partition member 6 on which the parts of the electrical apparatus are mounted. This member has a large, deep central cup-shaped portion 7 that extends down into the box. All of the bottom of member 7, except a narrow annular flange 8 along the cylindrical wall of the cup, is cut out to leave a large central opening. Member 6 is held in place by two long screws 9 that pass down through tubular posts 10, fixed to and rising up from the bottom of the main portion of the pan, and into flange 2. A block 11 of insulating material is set into the lower part of member 7 and has a section 12 of reduced diameter protruding through the bottom thereof. Secured to part 12 of said block, and depending therefrom into the box, are terminal devices 14 to which line wires may be connected. These terminal devices are held in place by screws 15 that extend down into the same from said block after first passing down through small dish-shaped contacts or terminals 17 on top of the block; each screw thus serving to fasten in place not only one of the terminals 14, but also one of the terminals 17.

Within the main portion of pan-shaped member 6 is a flat spring ring 18 resting at diametrically opposed points on little spacers 19 set on top of the main bottom wall of said member. Screws 20, passing through this ring and the

spacers and into the main bottom wall of member 6, hold the ring clear of such wall. The spring ring contains holes 21 larger in diameter than the tubular posts 10 and located in such positions that these posts extend freely there-through. Overlying ring 18 and resting on little spacers 22 on the latter, as best shown in Figs. 2 and 7, is a receptacle 23 the body portion of which comprises a cup-shaped member 24 of insulating material provided at the lower, closed end with a wide external flange 25. This flange is preferably so shaped that the lower part thereof enters the cavity in member 6 while the upper part is of a diameter too large to permit entry thereof into the cavity. Flange 25 contains holes 26 through which the tubular posts 10 extend freely. As best shown in Figs. 1 and 7, the receptacle is fastened to the spring ring by screws 27 that extend down through the flange 26, the spacers 22 and the ring.

Within the receptacle are any usual or suitable terminals for cooperation with terminals on a light bulb. In the arrangement shown, there are the conventional central contact finger 28 and the screw threaded sleeve 29 forming a lining for the cup. On the under side of the receptacle are two dish-shaped contacts or terminals 30 similar to and directly above the terminals 17 on top of the block. One terminal 30 is connected to finger 28 by a rivet 31 that passes through the bottom wall of cup 24, while the other terminal 30 is held in place by a similar rivet that fastens the sleeve 29. Between each terminal 17 and the corresponding terminal 30 is a coiled compression spring 32 of metal, its ends resting in the cavities or depressions in these terminals to prevent the spring from slipping off sideways. The parts are so proportioned that when the coiled springs, or connectors, are set on the terminals 17 and the receptacle is lowered and fastened to the spring ring, the coiled springs are placed under an initial compression sufficient to insure good electrically conductive connections between the outside terminals and the terminals engaged by the base of the light bulb.

From an inspection of Figs. 1 and 2, it will be seen that a plane containing the axes of screws 20, which anchor the spring ring to the stationary support, is at right angles to a plane containing the axes of screws 27 which anchor the receptacle to the ring. Consequently, when the receptacle tends to vibrate it is in the manner of a rocking movement about an axis extending from one of the screws 20 to the other such screw. The receptacle may also rock about another main axis, namely about the diameter of the spring ring extending from one screw 27 to the other. It will also be seen that a line intersecting the axes of coiled springs 32 makes an angle of about 45° to the aforesaid axes about which the receptacle tends to rock. Consequently, the coiled springs act as resilient struts or spacers between the receptacle and the stationary support and serve to resist the natural rocking movement of the receptacle. In other words, both the spring ring and the pair of coiled springs function as cushioning means for the receptacle, and cooperate in a novel manner to reduce the extent of vibration of the receptacle to a minimum not attainable through the use of one such means alone.

Regarding the coiled springs simply with respect to their capacities as connectors, it will be seen that important new results are achieved.

Thus, the springs do not require to be fastened as in the case of wires; by properly proportioning the parts, good contact between the springs and the terminals engaged thereby is assured; and, because the springs cannot slip out of place, circuits cannot be interrupted as happens when the fastenings of wires become loose.

While I have illustrated and described with particularity only a single preferred form of my invention, I do not desire to be limited to the precise details thus illustrated and described; but intend to cover all forms and arrangements that come within the definitions of my invention constituting the appended claims.

I claim:

1. In combination, a receptacle member for a light bulb or other electrical device, a supporting member, a spring device yieldably so securing said members together with a space intervening between them that the receptacle may rock with its main movements about two axes at right angles to each other, spaced pairs of cooperating metal contacts so arranged that the contacts of each pair are mounted on said members opposite each other across said space, and an electrically conductive compression spring interposed between and engaging the contacts of each pair; the said contacts and compression springs being so located that a plane containing the axes of such springs makes an angle of 45° with each of said two axes; and the said contacts on the supporting member constituting terminals for current supplying means and the other contacts serving as terminals for the receptacle member.

2. A structure as set forth in claim 1, wherein the contacts are shaped to interlock with the springs to prevent relative movements between the springs and their cooperating contacts transversely of the axes of the springs.

3. A structure as set forth in claim 1, wherein the contacts are dish shaped and the compression springs are coiled springs of a diameter permitting the ends of the springs to seat themselves in the concavities in such contacts.

4. In combination, a supporting member having a central part composed of insulating material, a receptacle for a light bulb or other electrical device having a cup-shaped shell of insulating material provided adjacent to the base with an annular, peripheral flange having holes therethrough, resilient means arranged between the supporting member and the base of the shell yieldingly to secure them together in spaced relation to each other, tubular posts fixed to said supporting member and extending loosely through said holes for the purpose of receiving fastenings to secure the structure as a whole to an outlet box or the like, contacts on the shell base and the central part of said member so arranged that they are in pairs, those of each pair facing each other across the space between the receptacle and the supporting member, and coiled springs under an initial compression arranged one spring between each pair of contacts; the said contacts on the supporting member constituting terminals for current-supplying means and the other contacts constituting terminals for the receptacle.

5. In combination a support comprising a metal member having in the center a block of insulating material, coiled springs, spaced apart from each other, rising from said block and serving as elements of a current-supplying circuit, a flat ring of spring metal supported by said metal member at diametrically opposed points so as

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otherwise to stand clear of said member, a receptacle having a casing of insulating material resting on said ring and secured thereto at two diametrically opposed points remote from the points at which the ring is secured to said support, and terminals on said casing each resting upon one of the said coiled springs and causing it to be under an initial compression.

6. A structure as set forth in claim 5, wherein a plane parallel to the axis of the structure and containing the axes of the coiled springs makes a substantial angle with another plane parallel to the axis of the structure and passing through the two points at which the flat ring is fastened to the support.

7. The combination with an outlet box having an open side and an internal flange extending around the same a short distance inwardly from such open side, a partition resting on and secured to said flange, the center of the partition being a block of insulating material, a flat ring of spring metal overlying the partition and anchored thereto at diametrically opposed points and being otherwise spaced apart therefrom, spaced coiled springs rising from said block and serving as terminals for current-supplying means, a receptacle having a cup-shaped shell of insulating material provided near the base

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thereof with an annular external flange registering with said spring ring, means securing the latter flange to the spring ring at diametrically opposed points remote from the anchoring points on the ring, and terminals on said shell bearing on the near ends of the coiled springs.

8. A structure as set forth in claim 7, wherein the means for anchoring the partition to the flange in the box comprises tubular posts fixed to the partition and extending loosely through holes in the flange on the shell, together with screws extending through said posts and into the flange on the box.

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