

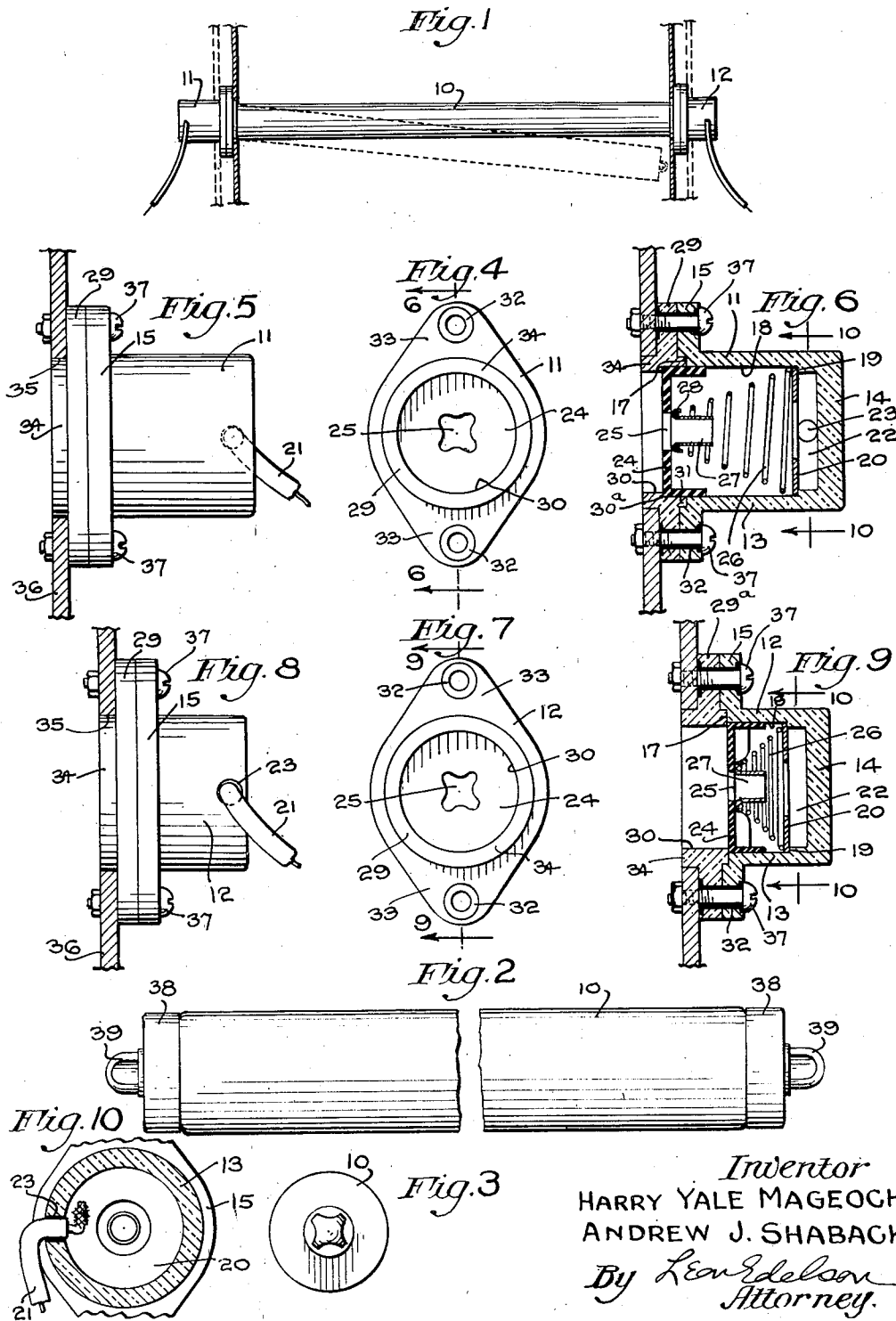
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FLUORESCENT LAMP SOCKET

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FLUORESCENT LAMP SOCKET

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This invention relates generally to electrical lamp sockets and more particularly to an improved construction of lamp socket adapted for use in conjunction with tubular fluorescent lamps of the type having at each opposite end thereof a single contact terminal.

Such fluorescent lamps are now frequently installed in passenger vehicles, such as busses, street-cars and railway passenger cars, and it is among the principal objects of the present invention to provide a socket designed especially for use in such vehicles which entirely eliminates the possibility of the tubular lamp being accidentally displaced from its supporting sockets when subjected to the normal shocks and vibrations of a moving vehicle, and which facilitates such mounting of the lamp that the overall length of the lamp and its opposite end sockets is substantially less than the length usually specified as standard for such mounting.

Still another object of the present invention is to provide an exceedingly simple and economical construction of a socket for tubular fluorescent lamps which is adapted to be readily installed within restricted spaces in the vehicle; which provides a strong and durable support for each end of the tubular lamp; which insures a positive and yet resilient electrical connection between the lamp terminal and the electrical conductor which supplies current thereto; and which, when employed in complementarily mated pairs, makes possible the installation of tubular fluorescent lamps which vary in their lengths within a mounting space measuring considerably less than the length of the lamp tube.

Still another and important object is to provide a socket of the character aforesaid having a mounting flange therefor formed at its front or lamp-receiving end in consequence of which it may be secured in position upon the end wall of a lighting fixture in such manner as to prevent the entry of dust into the fixture by way of the socket mounting, the socket in such case being disposed externally of the fixture so that the tubular lamp is effective as a light source throughout the full length of the fixture.

Other objects and advantages of the present invention will appear more fully hereinafter, it being understood that the present invention consists substantially in the combination, construction, location and relative arrangement of parts, all as will appear more fully hereinafter, as shown in the accompanying drawings and as finally pointed out in the appended claims.

In the accompanying drawings, which are illus-

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trative of a preferred construction of lamp embodying the principles of the present invention—

Figure 1 is an elevational view showing a typical mounting installation of a pair of the sockets of the present invention with a tubular lamp supported therebetween;

Figure 2 is an elevational view of the lamp per se;

Figure 3 is an end view of the lamp per se;

Figure 4 is a front elevational view of one of the pair of lamp sockets, in this instance that one having capacity for substantial axial movement of the lamp relatively thereto;

Figure 5 is a side elevational view of the lamp socket of Figure 4 showing the same in mounted position;

Figure 6 is a vertical sectional view thereof as taken on the line 6—6 of Figure 4;

Figure 7 is an end view of the other of the pair of lamp sockets, to wit, that one having a capacity for limited axial movement of the lamp relatively thereto much less than that of the socket shown in Figures 4 to 6;

Figure 8 is a side elevational view of the lamp socket of Figure 7 showing the same in mounted position;

Figure 9 is a vertical sectional view thereof as taken on the line 9—9 of Figure 7; and

Figure 10 is a sectional view typical of each of the pair of sockets as taken along the line 10—10 of Figure 6 or of Figure 9.

Referring now to the drawings, it will be observed that the socket as constructed in accordance with the present invention is designed to receive a terminal end of a tubular lamp 10 which is removably mounted, as shown in Figure 1, between a pair of said sockets respectively designated 11 and 12. Except for the fact that these sockets are of different overall dimensions measured axially thereof, for a reason which will be presently apparent, both of the sockets 11 and 12 comprising a supporting pair for the lamp 10 are of substantially similar construction.

Thus, each socket essentially comprises a main body member 13 of cup-shaped form having a closed end wall 14 and an external mounting flange 15 embracing its open end, the latter end of the body member being undercut to provide an annular seat 17 immediately surrounding the open end of the cylindrical recess 18 formed internally of the body member 13. The annular wall of the internal recess 18, adjacent the closed end thereof, is stepped, as at 19, to provide an annular seat for a metallic contact plate 23 to which is suitably secured, as by soldering or otherwise,

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the bared terminal end of a conductor wire 21 leading from a source of current supply (not shown). The annular seat for the plate 20 is preferably axially spaced from the end wall 14 of the socket member 13 so as to provide a space 22 between the plate 20 and the closed end wall of the socket for accommodation of the insulated portion of the conductor wire 21 which is projected into the socket by way of an opening 23 formed in the cylindrical wall of the body member 13.

Fitted within the open end of the cylindrical body member 13 for axial movement therein is a circumferentially flanged disk 24 having an aperture 25 centrally formed therein, this disk 24 being biased for axial movement outwardly of the socket member 13 by means of a conically shaped coiled compression spring 26 interposed between the inner contact plate 20 and the outer flanged disk 24, said spring being disposed coaxially with respect to the body member 13 and the disks 20 and 24. Suitably mounted within the reduced end of the conical spring 26 is a relatively short sleeve or grommet 27, the bore of which is in coaxial registry with the central aperture 25 of the flanged disk 24. Preferably, the outer end of the sleeve or grommet 27 is provided with an annular flange 28 which extends about and engages the outer convolution of the coil compression spring to insure a normal disposition of the sleeve coaxially with respect to the spring and to provide an electrical contact seat for the end of the lamp terminal pin.

In order to limit outward shifting of the disk 24 under the biasing influence of the compression spring 26, the body member 13 of socket 11 is fitted at its open end with a collar member 29 the central opening 30 of which is of somewhat smaller diameter than that of the cylindrical socket 18 and its snugly fitting spring-pressed disk 24. In order to provide for maximum permissible movement of the disk 24 axially of the socket, the collar 29 is preferably provided with an internal annular shoulder 30^a which is so spaced forwardly of the front or open end of the body member 18 that the collar member 29 partially constitutes a continuation of the cylindrical recess 18 of the socket. In order to insure proper registry of the members 13 and 29, the latter is provided with an axially extending annular projection 31 adapted to nest in the annular seat 17 of the member 13, the member 13 and 29 being permanently secured together in their assembled relation as shown by a pair of tubular rivets 32—32. Preferably, the juxtaposed flange portions of the members 13 and 29 are provided with diametrically opposed triangularly shaped mounting extensions 33—33 and it is within these extensions that the tubular securing rivets 32—32 are respectively located.

From the foregoing, it will be apparent that in the socket 11, the disk 24 is normally urged by its biasing spring 26 into position wherein it resiliently engages the internal shoulder 30^a of the outer retaining collar 29, the disk 24 having a capacity, however, of being axially shiftable inwardly of said collar 29.

Substantially the same construction is employed for socket 12 except that the collar member 29^a thereof is not undercut to form an internal shoulder, the outer limiting abutment for the disk 24 of socket 12 being formed directly by the inner edge of the collar member 29^a. In the case one of the sockets, e. g., that designated 11, the cylindrical body portion thereof is of such length as to provide for substantial shifting movement of the

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disk 24 upon the application of an axial force against its outer face. However, in the case of the other socket, e. g. that designated 12, the cylindrical body portion thereof is so reduced in length as to materially limit the permissible axial shifting movement of its disk 24, the biasing spring 29 being so much more compressed in the shorter socket 13 than in the longer socket 12 as to provide a materially greater resistance to axial shifting of the disk 24 in the shorter socket.

Preferably, each of the sockets 11 and 12 is provided at its lamp receiving end with an axial extension 34 which is adapted to project through and so accurately locate the socket within an opening 35 prepared therefor in a supporting panel 36. In use, a pair of the sockets 11 and 12 are respectively mounted, as by the securing bolts 37—37, in laterally spaced supporting panels 36—36 the distance between which is determined by the length of the tubular lamp intended to be supported between the sockets. This spacing between the sockets is generally such that when the tubular lamp is inserted therebetween, as shown in Figure 1, the end ferrule 38 of the lamp (see Figure 2) is embraced by the collar member 29 of the socket, while the terminal prong 39 of the lamp projects through the apertured disk 24 for electrical contact with the spring-pressed grommet 27 of the socket. It will be understood, of course, that whereas plate 20, the spring 26 and the sleeve 27 are all formed of suitable electrically conductive material, the members 13, 24 and 29 of each socket are formed of suitable electrical insulation material.

In mounting the tubular lamp operatively between the sockets 11 and 12, one end of the lamp is inserted into the lamp receiving end of the longer socket 11 with its terminal prong 39 projecting through the central aperture 25 of the spring-pressed disk 24. By pressing the lamp axially against said disk 24, the latter is shifted inwardly against the bias of the spring 26 to an extent sufficient to permit the opposite end of the lamp to be presented in alignment with its socket 12, whereupon, by relieving the pressure exerted against the first-mentioned disk 24, the lamp is properly centered between its opposed supporting sockets with its opposite terminal prongs 39—39 in proper electrical engagement with the contact grommets 27—27 of the sockets. In such operative position of the tubular lamp, current is delivered to the lamp terminal prongs through the contact plates 20—20, the compression springs 26—26 and the grommets 27—27, while the opposite ferruled ends of the lamp are respectively embraced by the external collar members 29—29 of the sockets, in consequence of which the lamp is secure against accidental dislodgement by reason of any shock or vibration to which the lamp and its mounting may be subjected. To remove a lamp from its operatively supported position between the sockets, it is merely necessary to press one end of the lamp axially against the spring-pressed disk 24 of the longer socket 11, whereupon the opposite end of the lamp is free to be swung laterally of the socket 12, as shown by the dotted line position of the lamp in Figure 1, following which it may be readily slipped out of the socket 11. As shown by the dotted lines in Figure 1, the sockets 11 and 12 may each be mounted upon its supporting panel in such manner as to expose the flanged head of the socket frontally of the panel, in which case the closed end of the socket is projected through the panel opening to

present the socket in proper position for securement to the panel.

It will be observed that each of the sockets 11 and 12 is characterized in that it is provided with a mounting flange at its front end and also in that the assembly of the socket during manufacture thereof is effected by way of its front or open end. The internal elements of both sockets, including the spring 26, the plate 20, the disk 24 and the grommet 27, are identical in construction for both sockets and consequently may be interchangeably employed in both sockets with resulting economy in manufacture thereof. Also, by reason of the fact that the sockets are provided with front end mounting flanges, it becomes possible to so mount them, as shown in Figure 1, upon the opposite end walls of a lighting fixture that they project externally of the fixture so that the tubular lamp extending therebetween is effective as a light source throughout the full length of the fixture.

It will be understood, of course, that this invention is susceptible of various changes and modifications which may be made from time to time, all without departing from the general principles or real spirit thereof, and it is accordingly intended to claim the invention broadly, as well as specifically, as indicated by the appended claims.

What is claimed as new and useful is:

1. A socket for a tubular fluorescent lamp of the type having a single axially projecting terminal pin at each end thereof comprising a cylindrical body member closed at one end thereof, a centrally apertured disk fitted in the open end of said body member for axial movement therein, a collar member fixedly secured to the open end of said body member, said collar member having an opening therein of an area sufficiently less than the internal cross-section area of said cylindrical body member to provide an internal shoulder which is engageable by said disk to limit axial movement thereof outwardly of said body member, a spirally coiled compression spring disposed interiorly of said cylindrical body member with its reduced end convolution engaging said disk and in substantial registry

with the central aperture thereof for resiliently urging said disk toward said internal shoulder, said spring being adapted to conduct current to the terminal pin of a tubular lamp inserted into said socket and said collar member being of an axial length sufficient to embrace a substantial portion of the inserted end of said tubular lamp when the terminal pin thereof is projected into and through the aperture of said disk and into engagement with the registering end convolution of said spring, and a conductor plate fitted in the base of said cylindrical body member to provide a rear abutment for the enlarged base convolution of said compression spring, said plate being in the form of a circular plate of a diameter adapted to snugly fit within the closed end of said cylindrical body member and being adapted for electrical connection to a conductor wire for supplying current to the terminal pin projecting from the end of the lamp embraced by said collar member.

2. In a socket of the character defined in claim 1 wherein said cylindrical body member and said collar member are respectively provided with matching flanges and wherein tubular rivets secure said flanges together in flatwise engagement, the bores of said rivets providing openings for the passage therethrough of elements for mounting the socket upon a support therefor.

3. In a socket of the character defined in claim 2 wherein said collar member is provided with a flange projecting axially of the open end of the socket, said flange being adapted for projection into an opening formed in the socket support.

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