March 31, 1942. H. F. LIVINGSTON 2,278,356

MOUNTING FOR ELECTRICAL CONNECTORS

Filed July 15, 1939

Fig. 1.

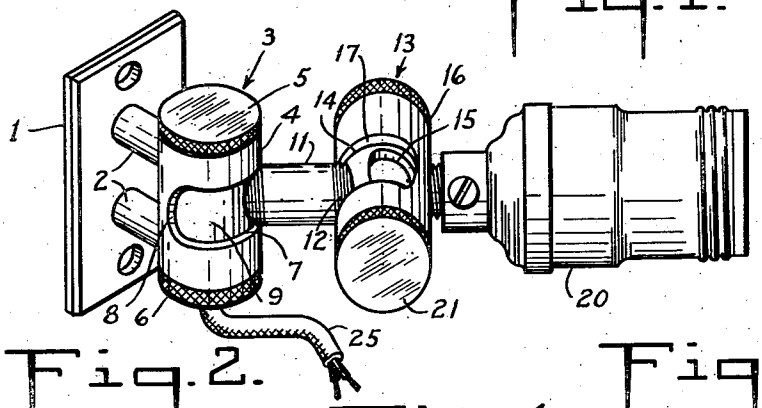


Fig. 2.

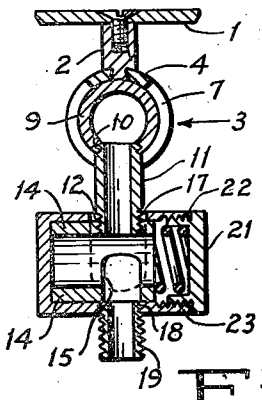


Fig. 4.

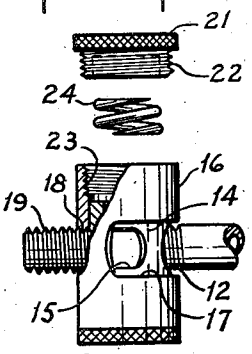


Fig. 3.

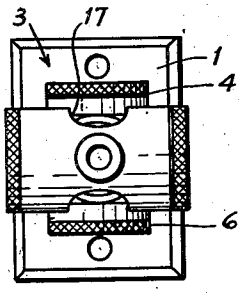


Fig. 5.

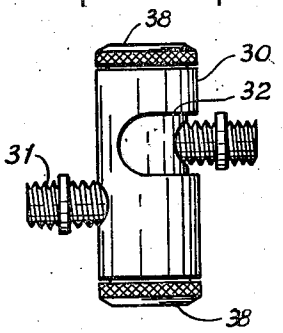
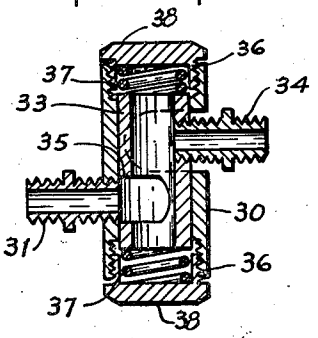


Fig. 6.



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MOUNTING FOR ELECTRICAL CONNECTORS

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2 Claims. (Cl. 248—278)

This invention relates to adjustable mountings for electrical connectors and has more particularly to do with such mountings which have controlled universal movement.

An object of the invention is to provide a simple and neat mounting for electrical connectors which though adjustable will cause a minimum of wear on the conductor passing therethrough.

Another object of the invention is to provide universal adjustment for such a mounting plus assurance that it will stay in the position in which it is set unless an outside force sufficient to overcome that set is applied.

Still another object of the invention is the provision of variable tension resilient means to exert tension on the mounting to allow its adjustment, but to retain it in the position in which it is set.

A further object of the invention is the provision of a mounting of the above character which may be adjusted to any position desired, through which the electrical conductor passes, but which in all positions offers a maximum covering and protection for the conductor.

Other objects of the invention will in part be obvious and in part appear hereinafter.

Adjustable mountings for electrical connectors as previously employed have been subject to various drawbacks which it is the purpose of this invention to overcome. In the majority of previous mountings, the setting of them in adjusted position has been uncertain, the setting means being either of a weak, fragile nature which in time would either wear or lose its life and fail to retain the mounting in set position or else of such a frictional nature that it would tend to bind and thus not allow any adjustment at all. Another form of adjustable mounting previously employed could not be actuated until a bolt, screw, or the like, were loosened and the same would have to be tightened again to secure the mounting in adjusting position. These previous mountings also afforded little protection for the conductor or wire carrying the electric current. In fact, those which encompassed such conductor or wire tended to chafe its insulation and render it unsafe. Others did not encompass the wire at all, allowing it to hang free from the actual connector and thus to be an unsightly obstruction. Furthermore, most of the previously employed mountings took up considerable space and were of no use where vibration was encountered, such as in an automobile or other vehicle. All in all the previously employed mountings were annoying and merely tolerated because no one had yet visualized the real solution to the problem.

The device of the invention, on the contrary, by providing a universally adjustable mounting for electrical connectors, which not only performs the functions desired of it, but is also neat, compact and ornamental, eliminates the annoyance previously encountered. This device may be set to whatever tension is desired to allow its subsequent adjustment but yet retain it in the position to which it is from time to time adjusted. The device is also designed to have a current carrying wire, or conductor, pass through it; yet the binding and chafing of such wire is kept down to a minimum and it is protected to the maximum extent so that its life is prolonged and failure of it is substantially eliminated. The device of the invention is easy to wire and due to the adjustable resiliency of its tensioning means, it will remain in the position where it is set in spite of vibration or movement of the stand, or like, to which it is attached. The invention also contemplates a mounting which not only incorporates the above advantages but also affords protection of the wire or conductor against weather conditions and is thus suitable for marine use for mounting search lights on boats, piers or the like. Thus, it is obvious that through this invention a decided improvement is made over prior constructions and the difficulties which were inherent in them are removed.

For a fuller understanding of the nature and objects of the invention reference should be had to the following detailed description of the embodiments shown in the accompanying drawing in which:

Fig. 1 is a perspective view of the mounting device of the invention showing an ordinary lamp socket carried thereby;

Fig. 2 is a horizontal section of the Fig. 1 construction taken through the center of the mounting device and through one of the bracket arms. In this view the lamp socket has been omitted;

Fig. 3 is an end elevation of the Fig. 1 construction, the lamp socket being omitted;

Fig. 4 is a plan view, partly in section and partly exploded of the vertical adjustment element of the Fig. 1 mounting device;

Fig. 5 is a plan view of a modified form of construction, and;

Fig. 6 is a section taken through the center of the Fig. 5 construction.

In Figs. 1, 2 and 3 of the drawing the electrical

connector mounting is shown as carried by a wall bracket 1 whose supporting arms 2 are secured in any desired manner to the stationary collar of the first element of the mounting. The showing of a bracket of this type is merely illustrative, it being understood that the invention is in no way limited thereby.

The first element of the mounting, through which horizontal movement is provided, is designated generally by the reference character 3. This element consists of a stationary collar 4 whose upper end is closed by means of a screw threaded cap whose periphery is knurled and whose threaded shank is received within the collar 4. Knurling is also shown at 6 forming a band around the bottom of the cylindrical face of the collar 4. Though in this particular instance the knurling 6 is merely applied to the collar to enable one to get a grip on it, it is within the contemplation of the invention to apply a ring at this position, which ring will have a knurled periphery and a screw threaded shank, the latter being received within the end of collar 4. The purposes of this ring will appear more fully hereinafter.

Another important feature of collar 4 is the slot or channel 7 through the wall thereof, which channel is of considerable width, and extends throughout the greater portion of the circumference of said collar. This slot or channel in the embodiment of Figs. 1 to 3 is located substantially midway between the ends of the collar 4. The ends of the slot or channel 7 are rounded as shown at 8.

Rotatably mounted within the collar 4 is a sleeve 9, the same being of less vertical height than the collar 4 in order to make room for a tension spring to be pressed against the end of the sleeve by means of the cap screw 5. This feature is not shown in detail here as it is the same as the tensioning means of the vertical adjustment element to be more fully described hereinafter. The portion of the sleeve 9 which lies across the inside of the slot 7 is apertured at 10 to receive a conduit member 11 whose diameter is slightly less than the width of the slot 7. Member 11 may be screw threadedly engaged in the aperture 10 of sleeve 9, may be peened therein, as shown in Fig. 2, or may be secured therein in any desired manner as its removal is generally not necessary.

On the opposed end of the conduit 11 there is mounted the second element, generally designated by reference character 13, through which vertical movement of the electrical connector is realized. Said opposed end is screw threaded as shown at 12 and is threadedly received in an aperture in the periphery of a sleeve 14 which is generally similar to the sleeve 9 just described. One of the differences resides in the fact that the aperture for receiving screw threaded end 12 is itself threaded and thus allows separation of the conduit 11 and the sleeve 14. The other difference is found in the fact that the greater portion of the periphery of the sleeve 14 opposite the entrant position of conduit 11 is cut away in the form of a channel or slot 15, generally similar in appearance, but of slightly less width than the slot 7 of the collar 4.

Rotatably mounted on and encompassing the sleeve 14 is a collar 16 which is circumferentially slotted at substantially its mid-point to form a slot 17 similar in size and extent to the slot 7 in the collar 4. This slot 17 embraces the end 12 of the conduit 11 and is designed to allow the collar 16 to be rotated on the sleeve 14 throughout more than a half circle. The portion of the periphery of the collar 16 which remains between the ends of the slot 17 is apertured at 18 to receive a nipple 19. This nipple may be plain, screw threaded, provide part of a bayonet joint, or be formed in any other desired manner to receive an electrical connector. As here shown, the nipple 19 is screw threaded to receive the end of an electrical connector which takes the form of an ordinary light socket. This socket is generally indicated at 20, but is merely used for illustrative purposes since the mounting of the invention is designed to take any type of electrical connector desired. Throughout the movement of the collar 16, the aperture through the nipple 19 is in line with the slot 15 in the sleeve 14 for purposes which will appear hereinafter.

Knurled bands are shown at the ends of the collar 16. Either one or both of these may be provided by the heads of cap screws, only one of which, however, is shown in the present instance. Such cap screw, having a head 21, with a reduced screw threaded shank 22 for reception in the screw threaded opening 23 of the collar 16, is best shown in Figs. 2 and 4. As can be readily seen, the screw threaded shank 22 is internally bored to receive a spring 24 whose ends engage the underside of the head 21 and the adjacent end of the sleeve 14 respectively. This same construction may be applied to both ends of the collar 16, particularly if delicacy of adjustment is required. Normally, however, one tensioning means is sufficient for each collar. The cap screw 5 on the collar 4 is the same as the cap screw 21 of the collar 16 and carries a similar spring into engagement with the end of the sleeve 9 in the same manner as shown for sleeve 14 in Fig. 2. Though the collar 4 is open on its bottom end and is merely knurled at 6, it is readily apparent that a screw threaded ring, as previously referred to, carrying a spring similar to that shown at 24 could be applied at the position indicated by knurling 6, without interfering with the function of the device.

From the description of the above construction, it will be obvious that an electrical current-carrying conduit or wire 25 can readily be fed in the open end of collar 4, through the conduit 11 into the sleeve 14 and out through the nipple 19. As a horizontal adjustment of the unit is made by turning the sleeve 9 within the collar 4, practically no distortion of the wire 25 will occur here since any twist that is imparted thereto will be absorbed through a considerable length thereof. When a vertical adjustment is made by the turning of the collar 16 on the sleeve 14, the wire will be moved from side to side, but such movement will take place in a chamber of sufficient extent to allow the wire to move freely and hence with little wear upon it. Furthermore, this freedom of movement will persist throughout the whole swing of vertical adjustment, since the aperture in nipple 19 registers with the slot 15, to prevent chafing or cutting of the insulation on the wire.

The manner in which tension to keep the elements in adjustable position is imparted is thought to be obvious from the construction described. The refinements, however, reside in the selection of spring 24 of sufficient rigidity that it will exert the proper resistance to turning when the cap screw 21 is merely brought down to position with a moderate manual turning force. The cap screw is so designed, however, that should the spring 24 impart either too great or too little

tension, adjustment may be made by turning it in the direction desired.

The modification shown in Figs. 5 and 6, by offsetting the entrant and exit nipples and the current carrying conduit or wire, enables that wire to be completely enclosed though the same adjustments as previously described are realized. In this modification, only one adjustment element is shown since the elements used would be duplicates, a collar **30** is apertured at one side of its center to receive a nipple **31** and is circumferentially slotted at **32** on the other side of its center for a distance somewhat greater than one-half its circumference. Within this collar there is received a sleeve **33** which is apertured at one side of its center to receive a nipple **34** in such a position that the same extends out through the slot **32** of the collar **30**. Likewise the sleeve is circumferentially slotted at **35**, which slot, when the sleeve is properly placed in the collar, is aligned with the nipple **31**. From this it is thought to be obvious that a wire or conduit fed in through one of these nipples along the inside of the sleeve **33** and out through the other nipple is not only protected against wear by contact with objects, but also protected against the action of the elements thereon. Furthermore, by using the exit nipple from this element as the entrant nipple of another element mounted at right angles to this one, a combination providing universal movement is formed.

In the Fig. 5 and 6 modification, identical cap screws **38** are screw threadedly received in each end of the collar **30**. These have the same construction as the cap screws previously described, being supplied with an internally bored and externally screw threaded shank **36**. A tension spring **37** is also provided for engagement between the underside of the head of the cap screw and the adjacent end of the sleeve **33**. These need not both be employed, but the symmetry of the construction is maintained by doing so. This construction, as shown, will probably not be absolutely leak-proof, but will be highly moisture resistant and will generally keep the wire passing therethrough clean and dry.

It can be seen from the above that the invention provides a universal mounting for an electric connector which has all the adjustment necessary for such a construction, has a positive control for such adjustment, is neat, compact and protects the wire or conduit passing therethrough. It is to be appreciated, however, that the herein disclosed embodiments are merely illustrations of the manner in which the invention can be put into practice, so are not to be interpreted in a limited sense.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An angularly adjustable support for an electrical connector comprising a stationary collar having a slot extending therethrough around part of the circumference thereof, a sleeve mounted for rotatable movement within said collar, a conduit member carried at one of its ends by said sleeve and extending out through said slot, a second sleeve carried on the other end of said conduit member, said second sleeve having the portion of its circumference opposite said conduit connection removed in the form of a slot, a collar, having a partly circumferential slot therethrough, mounted on said second sleeve for rotary movement with respect thereto, the slot in said second collar encompassing said conduit member and electrical connector carrying means mounted in said second collar to communicate with the slot in said second sleeve, said first and second collars being mounted at an angle to each other, said sleeves, collars, conduit and carrying means forming a passage for a current carrying wire therethrough whereby the maximum protection with minimum wear is provided for such wire.

2. An angularly adjustable support for an electrical connector comprising a stationary collar having a slot extending therethrough around part of the circumference thereof, a sleeve mounted for rotatable movement within said collar, a conduit member carried at one of its ends by said sleeve and extending out through said slot, a second sleeve carried on the other end of said conduit member, said second sleeve having the portion of its circumference opposite said conduit connection removed in the form of a slot, a collar, having a partly circumferential slot therethrough, mounted on said second sleeve for rotary movement with respect thereto, the slot in said second collar encompassing said conduit member, means on each member to apply tension between its collar and sleeve, means to vary said tension and electrical connector carrying means mounted in said second collar to communicate with the slot in said second sleeve, said first and second collars being mounted at an angle to each other, said sleeves, collars, conduit and carrying means forming a passage for a current carrying wire therethrough whereby the maximum protection with minimum wear is provided for such wire.

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