

May 19, 1964

T. J. RYS ETAL

3,133,781

ELECTRICAL CONNECTOR

Filed April 27, 1961

Fig. 1.

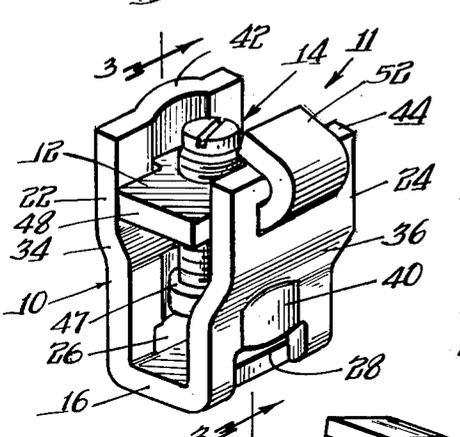


Fig. 3.

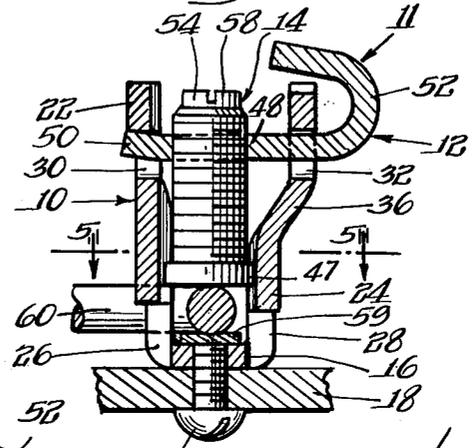


Fig. 2.

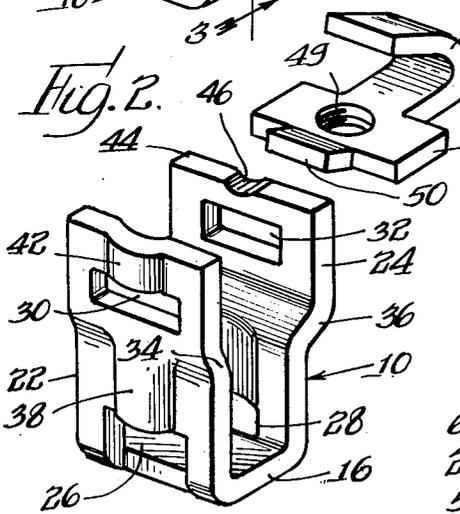


Fig. 4.

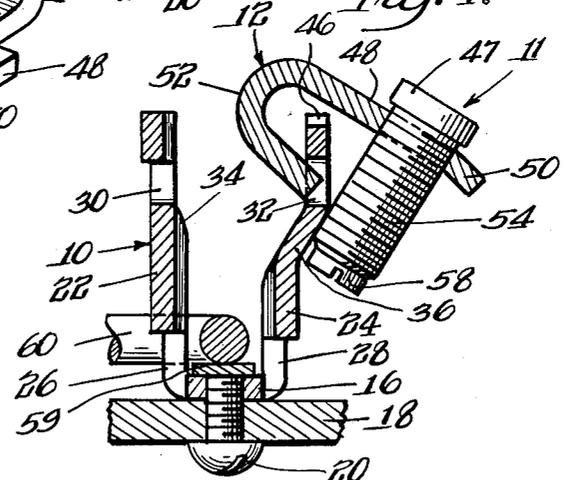


Fig. 6.

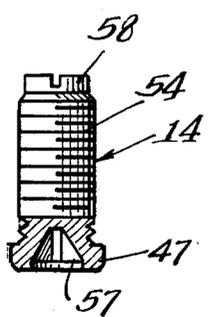
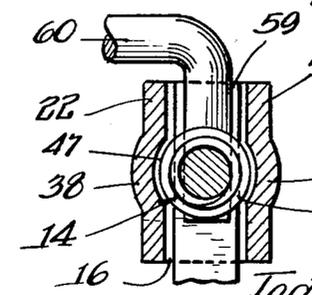


Fig. 5.



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ELECTRICAL CONNECTOR

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 Filed Apr. 27, 1961, Ser. No. 106,106
 11 Claims. (Cl. 339-272)

This invention relates to electrical connectors of the "lay-in" type adapted to transversely receive an electrical conductor in a generally U-shaped body portion thereof and to clamp the conductor in position by means of a clamping screw carried by a crosspiece or closing member mounted on the body portion.

An object of the invention is to provide an improved lay-in connector.

Another object is to provide a lay-in connector which has few parts and is economical to manufacture and durable in use.

A further object is to provide a lay-in connector which is not readily disassembled in normal use.

A still further object is to provide a lay-in connector wherein a clamping screw, which is carried by a crosspiece or closing member separably but pivotally connected to a generally U-shaped body portion, aids in maintaining the crosspiece connected to the body portion in the open position of the crosspiece so as to prevent loss or misplacement of the crosspiece.

Yet another object is to provide a lay-in connector having a generally U-shaped body portion constructed to accommodate an enlarged head portion of a screw as the clamping end thereof, whereby a separate clamping plate is not needed.

These and other objects of the invention will appear from time to time as the following specification proceeds and with reference to the accompanying drawings wherein:

FIGURE 1 is a perspective view of the connector of the invention;

FIGURE 2 is a perspective view, separately showing the body portion of the connector and the crosspiece or closing member removed therefrom;

FIGURE 3 is a central vertical sectional view taken along the line 3-3 of FIGURE 1, but showing an electric terminal strip, an electrical conductor clamped thereon, and a portion of an insulative mounting panel;

FIGURE 4 is a view similar to FIGURE 3 but showing the crosspiece or closing member of the connector in an open position;

FIGURE 5 is a horizontal sectional view taken along the line 5-5 of FIGURE 3; and

FIGURE 6 is a view of the clamping screw of the connector, shown partially in section.

The connector is generally indicated by the numeral 11 and includes a generally U-shaped body portion 10, a crosspiece or closing member 12, and a clamping screw 14. The body portion 10 includes a base portion 16 which may, for example, be fastened to an insulative mounting panel 18, forming a part of an electrical device, by means of a screw 20. Extending from opposite sides of the base portion 16 at substantially right angles thereto are two spaced leg portions 22 and 24 having slots 26 and 28 adjacent their respective lower ends and slots 30 and 32 adjacent their respective upper or free ends. The free ends of the leg portions 22 and 24 are offset as at 34 and 36 so that the free ends are spaced farther apart than the ends of the leg portions connected to the base portion 16. The offset 36 in the leg portion 24 is larger than the offset 34 in the leg portion 22. Between the offset 36 and the slot 28 the central portion of the leg portion 24 is bowed outwardly as indicated

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at 40 and best shown in FIGURE 5. Similarly, between the offset 34 and the slot 26 the central portion of the leg portion 22 is bowed outwardly as indicated at 38. In addition, the central portion of the leg portion 22 above the slot 30 is bowed outwardly as indicated at 42 and the top edge surface 44 of the leg portion 24 is centrally recessed as indicated at 46. The outwardly bowed portions 38, 40, and 42 provide clearance for an enlarged clamping head portion 47 of the clamping screw 14 and the slots 30 and 32 receive the crosspiece or closing member 12, as explained hereinafter.

The crosspiece 12 includes a generally rectangular portion 48 having a threaded hole 49 therethrough for the reception of the clamping screw 14. A short tongue portion 50 adapted to be received in the slot 30 projects from one side of the rectangular portion 48 and is bent slightly from the plane thereof, upwardly therefrom in the positions of the crosspiece 12 shown in FIGURES 2 and 3, to aid in retaining it in the slot 30 when a conductor is clamped in the connector. A long tongue portion 52 adapted to be received in the slot 32 projects from the other side of the rectangular portion 48 and is reversely curved to form in effect a loose pivotal connection with the portion of the leg portion 24 above the slot 32.

The clamping screw 14 includes a threaded body portion 54, the enlarged clamping head portion 47 which may have a cross-slotted recess 57 therein adapted to receive a screwdriver having a complementary end, and a reduced slot end portion 58 opposite the clamping head portion 47 adapted to receive the end of a conventional screwdriver.

In assembling, the end portion 58 of the clamping screw 14 is inserted into the hole 49 from the opposite side of the rectangular portion 48 from the reversely curved tongue portion 52 and the screw 14 is turned until enough threads of the body portion 54 are engaged to retain the screw 14 in the crosspiece 12 while still maintaining considerable space between the end portion 58 and the free end of reversely curved tongue portion 52. The free end of reversely curved tongue portion 52 is then inserted in the slot 32 from the side thereof adjacent the leg portion 22, somewhat as shown in FIGURE 4, and the clamping screw 14 is then threaded substantially the rest of the way into the hole 49 until the clamping head portion 56 abuts or nearly abuts the rectangular portion 48 of the crosspiece 12, also as shown in FIGURE 4.

The threading of the clamping screw 14 through the hole 49 substantially as far as it will go has a two-fold purpose. First, it locks the crosspiece 12 to the leg portion 24 of the body portion 10 so that it cannot become lost or misplaced, since the space between the clamping screw 14 and the free end of the reversely curved tongue portion 52 is then less than the thickness of the leg portion 24. Second, it enables the clamping head portion 47 of the clamping screw 14 to clear the free end of the leg portion 22 so that the crosspiece 12 can be rotated counterclockwise from the position of FIGURE 4 about the free end of the leg portion 24 to the clamping position of FIGURE 3.

The rectangular portion 48 of the crosspiece 12 is narrower than the space between the free ends of the leg portions 22 and 24, as can be noted in FIGURE 1, and the crosspiece 12 can be shifted toward the leg portion 42 to enable the tongue portion 50 to clear the free end of the leg portion 22. The crosspiece 12 can then be shifted back toward the leg portion 22 to engage the tongue portion 50 in the slot 30.

An electric terminal strip 59, which may be part of an electrical device with which the connector 11 is associated, is shown in FIGURES 3, 4, and 5 extending along

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the top of the base portion 16. It will be obvious that the terminal strip 59 may extend generally parallel to the leg portions 22 and 24 as shown, or it may extend generally perpendicular thereto through one or both of the slots 26 and 28. When the crosspiece 12 is in the open position as shown in FIGURE 4, an electrical conductor 60 can be laid in the body portion 10 of the connector between the leg portions 22 and 24 on top of the terminal strip 59. The crosspiece 12 can then be rotated to the clamping position in the manner above described and the clamping screw 14 turned down to clamp the connector 60 in place.

The outwardly bowing of portions 38 and 40 of the leg portions 24 and 22 establishes sufficient clearance for the clamping head portion 47 of the clamping screw 14, but the leg portions 22 and 24 are spaced closer together at the ends thereof adjacent the base portion 16 than the diameter of the clamping head portion 47 of the clamping screw 14. Thus, when the conductor 60 is a stranded wire, the strands are maintained within the closer spaced portions of the leg portions 22 and 24 on opposite sides of the bowed out portions 38 and 40 and prevented from being squeezed around the clamping head portion 47 of the clamping screw 14. Accordingly, a standard screw modified only by slotting of the end portion 58 may be used for clamping and a separate clamping plate pivotally mounted on the end of a clamping screw is not required. The bowing of the portion 42 of the leg portion 22 enables the clamping head portion 47 to clear the free end of the leg portion 22 when the crosspiece 12 is rotated into open and closed positions. Further, the recess 46 helps the body portion 54 of the clamping screw 14 clear the free end of leg portion 24.

It should be noted that the crosspiece 12 cannot be pivoted clockwise from the clamping position of FIGURE 3 to the open position of FIGURE 4 until the clamping screw 14 is backed out sufficiently for the clamping head portion 47 thereof to clear the free end of the leg portion 22, and that the clamping head portion 47 will not clear the free end of the leg portion 22 until it substantially abuts the crosspiece 12, and further, that when the clamping head portion 47 abuts the crosspiece 12, the end portion 58 of the clamping screw 14 is closely adjacent the free end of reversely curved tongue portion 52 so as to lock the crosspiece 12 to the leg portion 24. Thus, in normal use, the crosspiece 12 is in effect locked to the leg portion 24 without employment of an expensive riveted connection, and still the crosspiece is readily removable by the turning of the clamping screw 14 toward "clamping" position while the crosspiece is in open position, a procedure which would not be followed in normal use of the connector 11.

Various modifications may be made in the structure disclosed without departing from the spirit and scope of the invention.

The invention is claimed as follows:

1. An electrical connector comprising a generally U-shaped body portion having a base portion and a pair of spaced leg portions extending therefrom, one of said leg portions having a slot therethrough adjacent the end thereof remote from said base portion, a crosspiece having a reversely curved tongue portion receivable by said slot to form a loose pivotal connection between said crosspiece and said one leg portion, and a clamping screw threadedly received by said crosspiece and having a clamping end adapted to cooperate with said base portion to clamp a conductor therebetween, said clamping end of said clamping screw interfering with the other leg portion to prevent pivotal movement of said crosspiece on said one leg portion to an open position until said clamping screw is turned relatively to said crosspiece to position said clamping end closely adjacent said crosspiece and position the other end closely adjacent the free end of said reversely curved tongue portion to retain said crosspiece on said one leg portion.

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2. An electrical connector as claimed in claim 1, wherein the end of one of said leg portions remote from said base portion is outwardly offset.

3. An electrical connector as claimed in claim 1, wherein the ends of said leg portions remote from said base portion are outwardly offset.

4. An electrical connector as claimed in claim 1, wherein the ends of said leg portions remote from said base portion are outwardly offset and the remote end of of said one leg portion is outwardly offset more than the remote end of said other leg portion.

5. An electrical connector as claimed in claim 1, wherein said other leg portion has a slot therethrough opposite said slot in said one leg portion and said crosspiece has a second tongue portion opposite said reversely curved tongue portion, said second tongue portion being adapted to be received in the slot in said other leg portion.

6. An electrical connector as claimed in claim 5, wherein each of said leg portions has an additional slot therethrough adjacent said base portion.

7. An electrical connector as claimed in claim 1, wherein said clamping end of said clamping screw terminates in an enlarged clamping head portion.

8. An electrical connector as claimed in claim 7, wherein the ends of said leg portions adjacent said base portion are spaced closer together than the diameter of said enlarged clamping head portion of said clamping screw and are bowed outwardly centrally thereof to accommodate said clamping head portion.

9. An electrical connector as claimed in claim 5, wherein said second tongue portion of said crosspiece is bent in a direction away from said base portion of said U-shaped body portion when positioned in said slot in said other leg portion.

10. An electrical connector comprising a generally U-shaped body portion having a base portion and a pair of spaced leg portions extending therefrom, the free end portion of one of said leg portions being outwardly offset from the other end portion thereof adjacent said base portion in an amount sufficient to position the opposite end portions of said one leg portion completely out of alignment with each other, said free end portion of said one leg portion and the free end portion of the other leg portion respectively having slots extending transversely therethrough, a crosspiece having opposed tongue portions respectively receivable in said slots, the tongue portion receivable in the slot of said one leg portion being reversely curved to form a loose pivotal connection between said crosspiece and said one leg portion, and a clamping screw threadedly received in said crosspiece and having a clamping end adapted to cooperate with said base portion to clamp a conductor therebetween, said clamping end of said clamping screw interfering with said other leg portion to prevent pivotal movement of said crosspiece on said one leg portion to an open position until said clamping screw is turned relatively to said crosspiece to position said clamping end closely adjacent said crosspiece and at the same time position the other end closely adjacent the free end portion of said reversely curved tongue portion to retain said crosspiece on said one leg portion.

11. An electrical connector comprising a generally U-shaped body portion having a base portion and a pair of spaced leg portions extending therefrom, the free end portion of one of said leg portions being outwardly offset from the other end portion thereof adjacent said base portion in an amount sufficient to position the opposite end portions of said one leg portion completely out of alignment with each other, the free end portions of both of said leg portions respectively having slots extending transversely therethrough, a crosspiece having opposed tongue portions, one of said tongue portions extending through the slot in said one leg portion and being reversely curved about the free end portion of said one leg portion.

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tion to provide a pivotal mounting for said crosspiece and the other of said tongue portions being receivable in the slot in the other of said leg portions, and a clamping screw threadedly received by said crosspiece and terminating in an enlarged clamping head portion adapted to cooperate with said base portion to clamp a conductor therebetween, the end portions of said leg portions adjacent said base portion being spaced closer together than the diameter of said enlarged clamping head portion and being bowed outwardly centrally thereof to accommodate said clamping head portion.

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