Oct. 3, 1939. G. C. THOMAS, JR 2,175,097

CABLE CONNECTOR

Filed Sept. 4, 1936

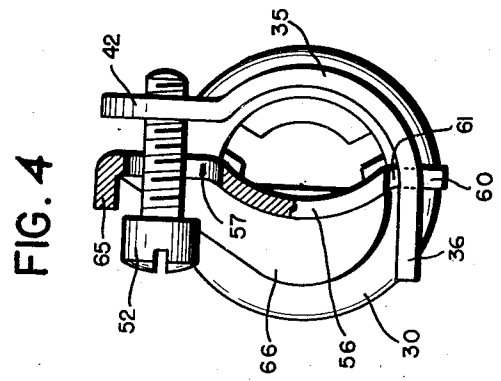


FIG. 4

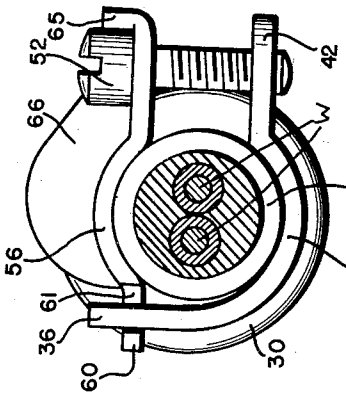


FIG. 7

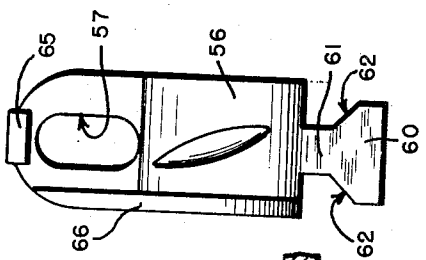


FIG. 3

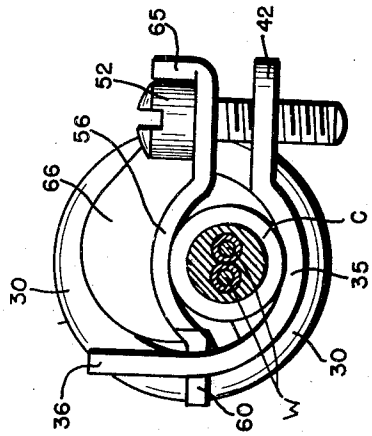


FIG. 6

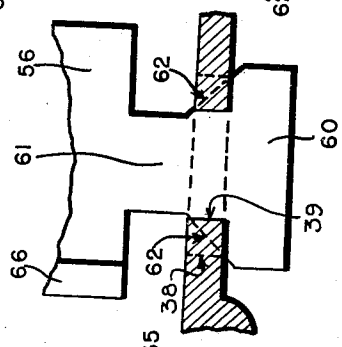


FIG. 2

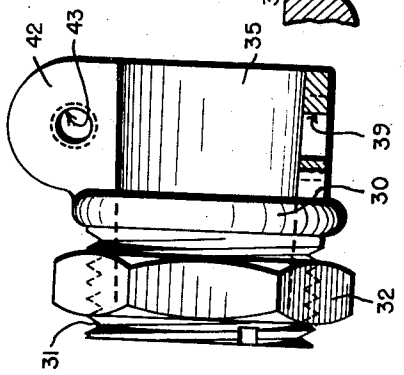


FIG. 1

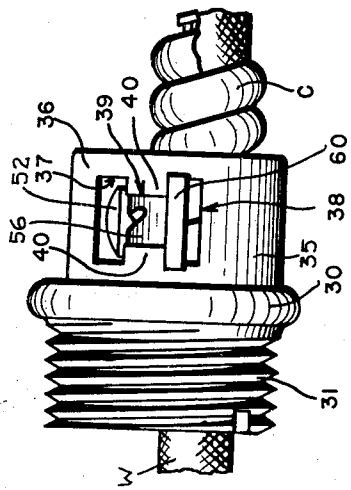


FIG. 5

INVENTOR.
GEORGE C. THOMAS JR.
BY Bohleber & Fedbetter
ATTORNEYS

Patented Oct. 3, 1939

2,175,097

UNITED STATES PATENT OFFICE

2,175,097

CABLE CONNECTOR

George C. Thomas, Jr., Elizabeth, N. J., assignor to The Thomas & Betts Co., Elizabeth, N. J., a corporation of New Jersey

Application September 4, 1936, Serial No. 99,334

3 Claims. (Cl. 285—6.5)

The invention relates to a connector by means of which a cylindrical part, such as a cable, is secured to an outlet box, or similar structure, so that wires may be projected through an outlet opening in the box and connected with an electrical fixture carried by or supported from the outlet box. The connector is designed particularly for cables, although its construction is capable of wider application and may be used to clamp any cylindrical or oval wiring structure.

The principal object of the invention is to design a cable connector which is adapted to clamp one of a plurality of different sizes of cables therein, and to clamp all sizes of cables with equal facility and efficiency.

Another object of the invention is to construct a cable connector which will clamp one of a plurality of different sizes of cables by providing a plurality of clamping positions for the clamping member relatively to the other member and in which the clamping member is movable from one clamping position for one size of cable to another clamping position for another size of cable without separation of the parts.

Another object is to produce a cable connector with a sleeve member and a clamping member having a plurality of positions relatively to the sleeve member, which positions adapt the connector for clamping a plurality of sizes of cables and also provide means or an arrangement of parts such that the two members are locked in selected position when gripping a cable between the members.

A still further object is to construct a cable connector including a sleeve member and a clamping member and in which one end of the latter has a plurality of positions relatively to the sleeve member thereby adapting the connector for a plurality of different sizes of cables. The connector is also constructed so that the clamping member is retained against lateral displacement when shifting the same from one position to another.

Other objects of the invention will be more apparent from the following description taken in connection with the accompanying drawing showing some preferred embodiments of the invention, in which:

Figure 1 is a longitudinal section through the sleeve member which is secured to or within a box hole in an outlet box.

Figure 2 is an enlarged detail view, partially in section, of the connection between the clamping plate or member and the sleeve member or particularly between the recess or bearing carried by the sleeve member and the clamping plate. The clamping plate is shown in engaging position in the recess.

Figure 3 is a plan view of the clamping member.

Figure 4 is an end view of the assembled cable connector with a part of the clamping plate or member in section showing the connection thereof with an operating screw by means of an elongated slot.

Figure 5 is a side view of the cable connector gripping a small diameter cable and showing a plurality of spaced bearings for the clamping plate.

Figure 6 is an end view of the connector of Figures 4 and 5 gripping a small diameter cable.

Figure 7 is an end view of the cable connector of Figure 4 with the clamping member in its upper or large diameter cable position and gripping a large diameter cable.

The cable connector to be described herein is adjustable so that a plurality of different sizes of cables may be effectively clamped therein merely by adjusting the clamping plate or member in one of a plurality of positions which it may take. Preferably one position is provided for the clamping member for each cable size so that if the cable connector is to be adapted for clamping two different sizes of cables, then two positions are provided for the clamping plate.

It is desirable in a cable connector which is adapted for different sizes of cables to construct the connector in such a way that the clamping member or plate may be shifted from one of its positions to another without separating the parts of the connector. When attaching a connector to a cable, an electrician has to manipulate one tool, the connector, and the cable. If the connector is made up of separable parts, he will frequently drop a part of the connector in assembling it upon the cable and must retrieve it. This is inconvenient and also results in loss of time. Such inconvenience and loss of time, resulting from dropping and retrieving parts, will not occur with a connector which is adjustable for different sizes of cable if the parts need not be separated when making an adjustment for a particular size of cable.

The cable connector includes a sleeve member **30** which carries means for securing the connector to an outlet box and preferably within an opening in the outlet box. Any such securing means is contemplated, that illustrated utilizing the threaded part **31** of the sleeve member and a nut **32** which is received thereon. The part **31** is inserted in a box hole in the wall of an outlet box,

which wall is then clamped between the bead of the sleeve member 30 and the nut.

The sleeve member has a clamping seat 35 against which a cable is adapted to be clamped. The sleeve member also has a bearing portion 36 which is shown as being a continuation of the clamping seat 35. The bearing portion 36 has a plurality of spaced bearings which are illustrated in the form of recesses 37 and 38. Any form of clamping member bearing is contemplated and the recesses illustrated provide the simplest form of such bearing. The recesses 37 and 38 are connected by a passage 39, the purpose of which will appear more fully hereinafter. The recesses 37 and 38 and the passage 39 are in the form of an I, as viewed in Figure 5, or the letter H if viewed with the cable connector standing on end.

The sleeve member 30 has a projection or ear 42 which is also shown as being a continuation or extension of the clamping seat 35. A screw hole 43 is provided in the ear 42. This screw hole is adapted to receive an operating screw, as will appear more fully hereinafter.

A clamping member or plate 56 has an elongated slot 57 at one end as illustrated in Figure 3. The two members, represented by the clamping member 56 and the sleeve member 30, carry means for supporting one end of the clamping member in cooperative relation with the clamping seat 35 of the sleeve member. This means includes a plurality of spaced bearings, illustrated as recesses 37 and 38 in the sleeve member, and a projection 60, 61 upon the other member, illustrated as being upon the end of the clamping member. The projection, or it may be the end of the clamping member, engages in one of the recesses and is shiftable to another recess whereby cables of different size may be clamped in the cable connector. The projection is illustrated in Figure 5 as being received in the lower recess 38.

The projection includes a wide portion 60 which is joined to the clamping member 56, or particularly to the clamping seat thereof, by a neck 61. This neck 61 is narrow enough to pass freely through the passage 59. Part of the wide portion of the projection is preferably greater in width than the recesses 37 or 38 in which the wide portion 60 is received so that the wide portion 60 of the projection cannot be pulled through the recess. In the construction particularly shown the wide portion has angularly directed sides 62 which enable the wide portion 60 to enter into the recess 38 so that the upper face thereof engages the projections 40 in order to provide a bearing or fulcrum for the clamping member. There are other ways of constructing this wide portion 60 of the clamping member 56, that illustrated being merely a preferred form for obtaining cooperating bearing engagement between the sleeve member 30 and the clamping member 56.

It has been described that the wide portion 60 of the projection is greater in width than the length of the recess 37 or 38. The wide portion 60 is inserted into the recess by tipping the clamping plate or member so that the wide portion 60 is vertical and passes through the passageway 39. It will be observed, therefore, that the combined dimension of the length of the passage 39 joining the recesses 37 and 38 and the width of the recesses 37 and 38 is greater than the width of the wide portion 60. After the wide portion 60 is passed through the recesses and passage so that the neck 61 is within the passage, the clamping plate may be turned horizontally to its normal clamping position.

An operating means in the form of a screw 52 passes through the slot 57 in the clamping member 56 and is received in the threaded hole 43 in the ear 42, as illustrated in Figure 4, after the clamping member has been mounted in the bearing portion 36 or in one of the recesses 37 or 38. The operating screw forces the clamping member 56 towards the clamping seat 35 on the sleeve member 30 and thereby clamps a cable C in the cable connector. It is clear that the operating screw may be threaded into either member and the slot provided in the other member without altering the operation or effectiveness of the screw.

In shifting the clamping plate from one recess 37 or 38 to the other, the clamping member 56 is moved endwise to the left or outwardly from the position illustrated in Figure 6, so that the narrow neck 61 is the portion of the clamping member which is directly in the recess. The clamping member may then be lifted since the neck 61 will pass through the passage 59 until the clamping plate or member is in the upper recess 37. The clamping plate is then moved endwise to the right or inwardly to the position illustrated in Figure 7, whereupon the wide portion 60 engages the upper surface of the recess 37. In this position, the cable connector is adapted to receive the large diameter of wire or cable LC. Tightening of the operating screw 52 then clamps the cable between the clamping member and the clamping seat 35 of the sleeve member 30.

The clamping member 56 has an arcuate or curved seat formed therein which engages the cables C or LC. With the large cable LC, as illustrated in Figure 7, this arcuate seat prevents endwise movement of the clamping plate. With a smaller cable, however, as illustrated in Figure 6, it may be possible to obtain a certain degree of endwise movement which may be sufficient to disengage the wide portion 60 from the recess 38. In order to positively lock the clamping member 56 against endwise movement when the cable is clamped in the cable connector, means is provided for preventing such endwise movement. This means includes a shoulder or abutment particularly shown as being formed by an upturned lug 65. This lug is so positioned that when the clamping member 56 is moved to the right and the clamping screw 52 is tightened to grip the cable, the head of the operating screw 52 locks the clamping plate against endwise movement to the left or outwardly, which is the direction of movement which must take place in order to release engagement of the wide portion 60 from within the recess 38.

Disengagement of the projection 60, 61 from its respective recess is accomplished by providing a slot 57 in the clamping member 56 which enables endwise disengaging movement of the clamping member and projection from the recess. Other methods of obtaining disengagement of the projection from its recess for movement to another recess are contemplated, and the endwise movement is illustrative only. Any kind of relative movement between the members in order to disengage the projection from its recess is contemplated.

In the invention described hereinbefore, means are provided for retaining the end of the clamping member within the opening formed by the recesses and connecting passage when shifting from one recess or bearing to the other, which means

also prevents lateral displacement of the clamping member. This means is the projection **60** and the neck **61**.

It will be observed that the recesses are carried by the sleeve member. This is the preferred construction and the recesses may be carried upon either member forming the cable connector, and the part or projection which engages in one of the recesses is then carried by the other member. Similarly, it is immaterial which one of the members carries the screw threads for the operating screw and which is provided with an opening for receiving the operating screw. Although the preferred form of bearing utilizes recesses, it is to be understood that other forms of bearings are contemplated and within the scope of the invention. Also the members are made of material which is rigid so that they retain their shape without any detrimental bending and so that a pivotal or hinged connection may be provided at or between the bearings.

Various modifications will occur to those skilled in the art in the configuration, composition and disposition of the component elements going to make up the invention as a whole, as well as in the selective combination or application of the respective elements, and no limitation is intended by the phraseology of the foregoing description or illustrations in the accompanying drawing.

What is claimed is:

1. A cable connector for securing a cable to an outlet box comprising a sleeve member having a clamping seat; means carried by the sleeve member to secure the same within a box hole; a clamping member; means carried by the two members for supporting one end of the clamping member in cooperative relation with the clamping seat including a plurality of spaced recesses in the sleeve member, and a projection upon the end of the clamping member engaging in one of the recesses and shiftable to another whereby cables of different sizes may be clamped in the connector, the projection including a cap, and a narrower neck between the clamping member and cap; an operating screw carried by the sleeve member; a slot in the clamping member through which the operating screw passes and engages the clamping member to force the same towards the clamping seat and into clamping engagement with a cable within the sleeve member, the slot enabling inward endwise movement of the clamping member to remove the cap from engagement with a recess for insertion in another recess without removing the clamping member from the operating screw; and a passage connecting the recesses through which the neck passes.

2. A cable connector for securing a cable to an outlet box comprising a sleeve member having a clamping seat; means carried by the sleeve member to secure the same within a box hole; a clamping member; means carried by the two members for supporting one end of the clamping member in cooperative relation with the clamping seat including a plurality of spaced recesses in the sleeve member, and a projection upon the end of the clamping member engaging in one of the recesses and shiftable to another whereby cables of different sizes may be clamped in the connector, the projection including a wide portion, and a narrower neck between the clamping member and the wide portion; an operating screw carried by the sleeve member and having a head; a slot in the clamping member through which the operating screw passes and engages the clamping member to force the same towards the clamping seat and into clamping engagement with a cable within the sleeve member, the slot enabling inward endwise movement of the clamping member to remove the cap from engagement with a recess for insertion in another recess without removing the clamping member from the operating screw; means to prevent endwise displacement of the clamping member after clamping a cable within the connector including a shoulder upon the clamping member engaging the head of the screw when tightened; and a passage connecting the recesses through which the second projection passes.

3. A cable connector for securing a cable to an outlet box comprising a sleeve member having a clamping seat; means carried by the sleeve member to secure the same within a box hole; a clamping member having a clamping seat; means carried by the two members for supporting one end of the clamping member in cooperative relation with the clamping seat including a plurality of spaced recesses in the sleeve member, and a projection upon the end of the clamping member engaging in one of the recesses and shiftable to another whereby cables of different sizes may be clamped in the connector, the projection including a wide portion having a part which is greater in width than the length of the recess, and a narrower neck between the clamping seat and the wide portion; an operating screw carried by the sleeve member; a slot in the clamping member through which the operating screw passes and engages the clamping member to force the same towards the clamping seat upon the sleeve member and into clamping engagement with a cable thereon, the slot enabling endwise movement of the clamping member to remove the projection from engagement with a recess for insertion in another recess without removing the clamping member from the operating screw; and a passage connecting the recesses through which the neck passes when the clamping member is shifted from one recess to another, the combined dimension of the passage and the width of the two recesses permitting the projection to be inserted into a recess.

GEORGE C. THOMAS, JR.