March 22, 1949. A. R. ROSS 2,464,893

EXTENSION CORD CONNECTION LOCK

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Fig. 1

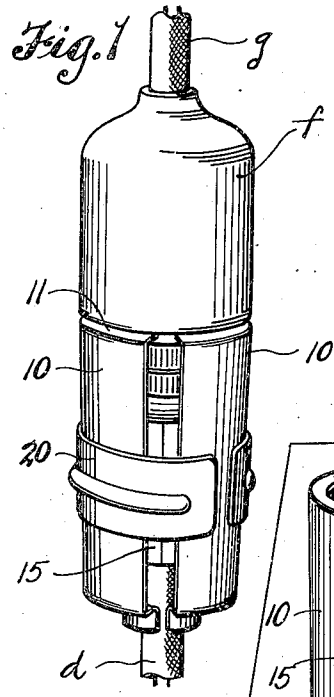


Fig. 3

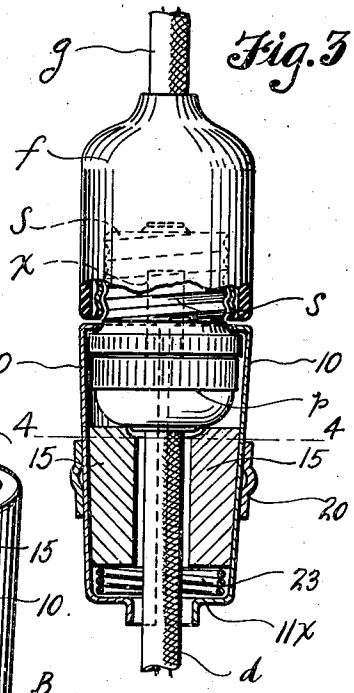


Fig. 2

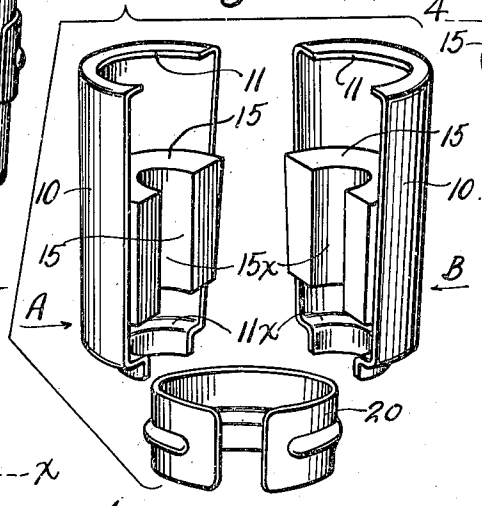


Fig. 5

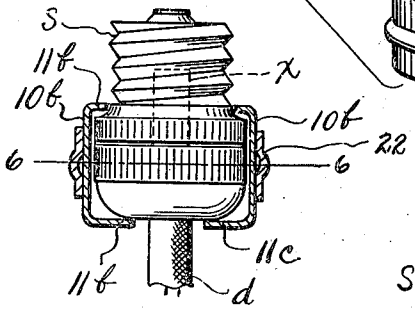


Fig. 4

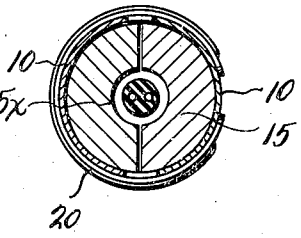
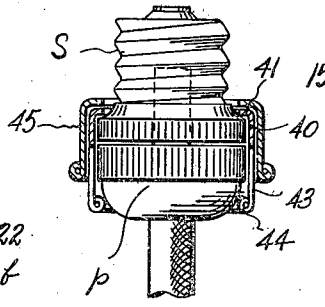


Fig. 11



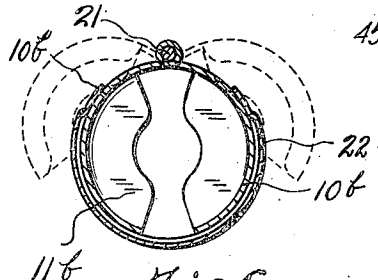


Fig. 6

INVENTOR
ALLEN R. ROSS
BY Cook & Robinson
ATTORNEYS

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Fig. 7

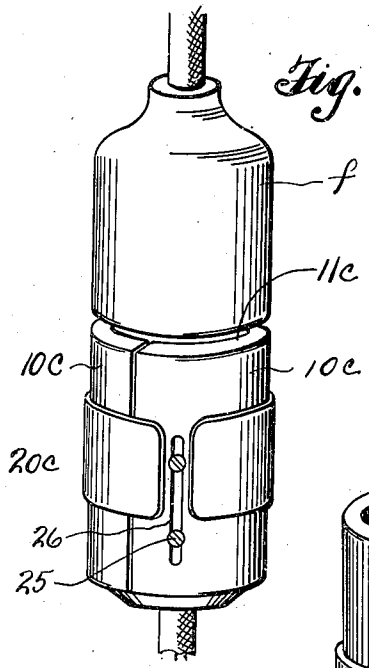
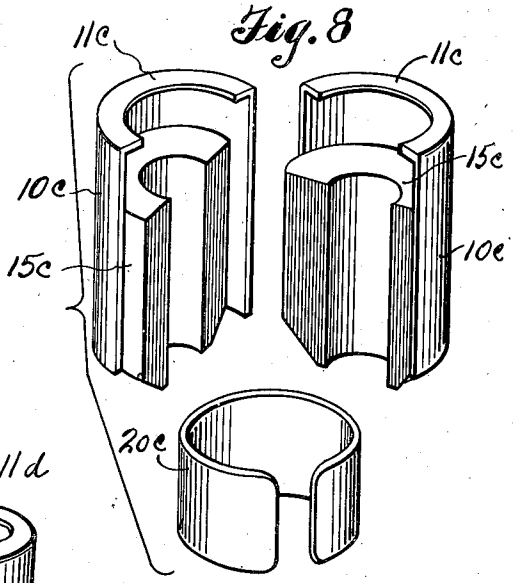


Fig. 8



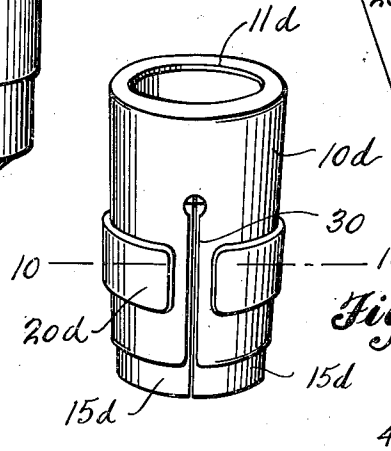


Fig. 9

Fig. 10

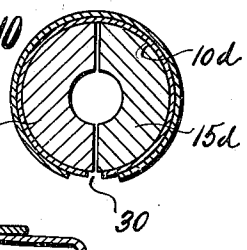
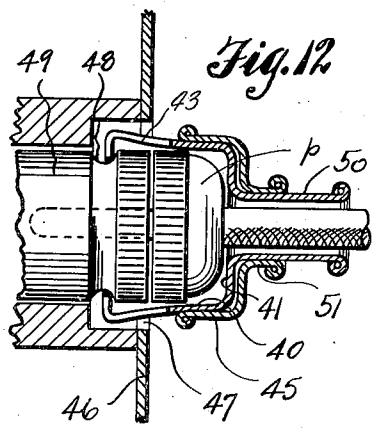


Fig. 13

Fig. 12



INVENTOR
ALLEN R. ROSS
BY Cook & Robinson
ATTORNEYS

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EXTENSION CORD CONNECTION LOCK

Allen R. Ross, Seattle, Wash.

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5 Claims. (Cl. 173—343)

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This invention relates to electric connector retainers and has reference more particularly to means whereby a plugged-in connector of an electric circuit may be retained against accidental withdrawal or displacement from the socket member to which it is applied; it being the principal object of this invention to provide connector retainers of simplified construction that are easy to apply and remove; that are adjustable to suit the particular connection to which they may be applied, and efficient and effective for their intended use.

More specifically stated, it is the object of this invention to provide an electric connector retainer comprising a housing of novel character that may be readily applied about the plug and socket members of the electrical connection in position to holdingly engage with each, and a clamping sleeve that may be removably applied about the housing to cause it to holdingly engage with the joined parts to prevent their being pulled apart.

Another object of this invention is to embody the present invention in various alternative or modified forms of construction in order that connections made by various types of plugs, sockets and fixtures may be accommodated.

It is also an object of this invention to provide connector retainers that are applicable to wall boxes or inlets to prevent the accidental pulling out of a plugged in member.

Still further objects of the invention are to be found in the details of construction of the device in its preferred and in modified or alternative forms, in the relationship of parts, and mode of use of the devices as will hereinafter be fully described.

In accomplishing these and other objects of the invention, I have provided the improved details of construction, the preferred and alternative forms of which are illustrated in the accompanying drawings, wherein—

Fig. 1 is a perspective view of a connector retainer embodied by the present invention as functionally applied to the plug and socket members of an electrical connection.

Fig. 2 is a perspective view of the parts of the connector retainer shown in separated relationship for better disclosure of details and functional characteristics.

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Fig. 3 is a longitudinal section of the connector as functionally applied.

Fig. 4 is a cross section taken on line 4—4 in Fig. 3.

Fig. 5 is a central, longitudinal section of a connector retainer of another alternative form.

Fig. 6 is a cross sectional view of the same taken on line 6—6 in Fig. 5.

Fig. 7 is a perspective view of a connector retainer of still another alternative form.

Fig. 8 is a perspective view of the parts of the device of Fig. 7 shown in disconnected relationship.

Fig. 9 is a side view of an alternative form of connector retainer having a one-piece housing.

Fig. 10 is a cross section on line 10—10 in Fig. 9.

Fig. 11 is a longitudinal section of still another form of connector retainer.

Fig. 12 is a view, partly in section of another form of connection designed for wall box application.

Fig. 13 is a sectional view of still another modification.

Referring more in detail to the drawings:

First, in order to impart a better understanding of the purpose and mode of use of the present connector retainer, I have shown in various views, as in Figs. 1 and 3, an electrical circuit connection made between a socket member designated by reference character *s* and a plugged in member referred to as the plug and designated by reference character *p*. It is understood that the member *p* is equipped with the usual contacts or prongs *x* to which electrical circuit wires are connected within the plug, and also that the socket member is equipped in the usual manner with socket contacts therein to be engaged by the prongs of the plug to complete the circuit connections between the plug and socket member when they are joined.

The circuit wires leading to the plug are designated generally at *d* in Figs. 1 and 3, and it is understood that the socket member may, in turn, be threaded into a socket fixture *f* as shown, and to which circuit connections *g* lead.

It is not the intent that the present connector retainer should be restricted to any particular type or style of connection, but that it be more or less universally applicable to present-day types

of electrical connections of the plug and socket types.

The device that is illustrated in Figs. 1 and 2 inclusive shows a connector retainer comprising complemental opposite side portions which are designated in their entireties in Fig. 2 by the reference characters A and B. Each comprises a somewhat semi-cylindrical, sleeve-like portion 10, designed to form one side of a retainer housing. Each is formed at one end with a narrow, inturned flange 11, as observed in Fig. 3. The sleeve portions 10 may be of plastic, metal or other suitable material, and the two parts are of the same size and may be brought together, coaxially alined, as in Figs. 1 and 4, to form an enclosing case or housing which would be of such diameter and length as to closely contain therein a plug and socket member which had been assembled to make an electrical connection, as best illustrated in Fig. 3.

It is a feature of this particular embodiment of the device that the housing formed by the assembled parts 10 is slightly tapered toward that end which is away from the ends equipped with the flanges 11. The reason for this presently will be apparent.

Applied within each of the complemental housing members 10 is an abutment block 15 shaped to fit the inside surface of the housing piece to which it is applied and slidable therealong. When the complemental parts of the housing are applied to the opposite sides of a plug and socket member, as shown in Fig. 3, then the two block members 15 are brought into registration and together form a stop or abutment that may be readily shifted into engagement with the outer end of the plug to retain it against withdrawal from the socket member. These blocks 15 have their engaging surfaces longitudinally channeled, as at 15*x*, to provide a central or axial passageway for the easy passage of the cord or electrical connection *d* between them without their interference with the fitting of the parts together. A split sleeve or band 20 is provided to be applied about the assembled parts A and B to hold them functionally in position about connected plug and socket members.

Assuming the parts of the connector retainer, in its embodiment shown in Figs. 1 to 4, to be so constructed, they would be applied and used as follows: First, the plug member is applied to the socket member. Then the opposite side portions 10 of the retainer housing, each with a block 15 seated therein, are applied to the plug and socket from opposite sides; the end flanges 11 of the parts 10 being hooked over the shoulder of the socket member and the blocks 15 being pushed up in the housing tightly against the lower or base surface of the plug. Then the clamping sleeve 20 is slipped onto the assembled parts and adjusted therealong, from the smaller toward the larger end, and by this movement it tightens about the housing, drawing the parts inwardly and thereby effectively retaining the abutment blocks 15 from any releasing movement.

It will be apparent that when the parts have been so applied and clamped together, the blocks 15 and the flanges 11 will coact to retain the plug against withdrawal from the socket member. However, to release the retainer, it is only necessary to slip the sleeve endwise from the smaller end of the housing and to separate the opposite side portions thereof, thus to disengage the plug so that it may be withdrawn.

It is illustrated best in Figs. 2 and 3 that the lower end portions of the housings 10 which form the opposite side members of the retainer are formed with inturned flanges 11*x*. These flanges aid in the assembly of the parts, in that they will retain the blocks 15 against slipping endwise from the housing while the parts are being assembled and before the clamping ring 20 has been applied. It is anticipated further that these flanges 11*x* may serve also as a support for a short, coiled spring such as that which has been shown at 23 in Fig. 3, which will operate to automatically urge the blocks 15 up toward the base of the plug preparatory to the application of the clamping ring 20 to the assembled parts.

It will be understood that when the spring is used, it is merely necessary to apply the opposite side members of the retainer to the connection. The spring automatically shifts the retainer blocks up against the base of the plug and when the clamp ring 20 is applied, all the parts will be held tightly assembled without any looseness permitted in the connection between the plug and socket member.

In Figs. 5 and 6, I have shown an alternative construction wherein the retainer housing comprises two semi-cylindrical portions 10*b* and 10*b*, each with inturned flanges 11*b* at its opposite ends. The parts 10*b* are hinged at corresponding edges, as at 21, to open apart and to close together. The length of this housing is such that when applied to a connection, they will holdingly engage with the outer ends or surfaces of the plug and socket members. A split sleeve 22 is applicable about the parts when applied to the connection, to hold the retainer in place, and this sleeve may be slipped clear of the hinged parts for release of the device from the connection.

Another modification of the invention is shown in Figs. 7 and 8 wherein the retainer housing is formed by two complemental opposite side portions 10*c* and 10*c* of cylindrical form, adapted, as are the corresponding parts of the device of Fig. 1, to be assembled together, edge to edge, to form the retainer housing. These parts, at one end, have the inturned retainer flanges 11*c* adapted to hook over the shoulder or rim of the socket member and the diameter and length of the housing formed is such as to closely contain the plug and socket in the flanged end.

Fixed within each semi-cylindrical part 10*c* is an abutment block 15*c* which may be of wood or other suitable material so arranged that when the retainer housing comprised by the two parts 10*c*—10*c* is applied as in Fig. 7, the blocks will then engage against the outer end surface of the plug to retain it seated. These blocks 15*c* are generally of the same character as those of the device of Fig. 1, but are adjustably fixed in place for endwise adjustment to accommodate the length of connection to which they are applied.

In order that the two complemental parts, when assembled, may be held against transverse slippage one on the other, the semi-cylindrical blocks 15*c* are fixed within their respective housing members 10*c* in such manner that one edge of the housing will project beyond the corresponding edge of the block 15*c*. This is best illustrated in Fig. 8. With this relationship of housings and blocks, it is apparent that when the complemental parts are brought into assembled relationship, the joint surfaces between the

edges of housings will be radially offset from the joint formed between the block surfaces.

The endwise adjustment of the blocks is provided for by securing them together by means of screws **25** that are extended through slots **26** formed lengthwise in the housing members. The screws have heads that are adapted to be tightened against the housings to secure the blocks at any definite spacing from the end flanges. After the opposite side blocks and housings have been applied as in Fig. 7, they may be clamped in place by applying a yielding split sleeve or ring **20***d* about the parts.

In Figs. 9 and 10, yet another modification of the connector retainer of this invention is shown. In this embodiment, the housing is a one-piece tubular member **10***d* formed at its upper end with an inturned flange **11***d* and formed lengthwise with one or more slots **30** from its lower end upwardly. This housing may be applied about the assembled plug and socket as the devices of Figs. 1 or 7. Fitted within the lower end of this sleeve is an abutment plug **15***d*, of one or more parts, designed to engage against the lower end of the plug to prevent its being withdrawn from the socket. A collar **20***d* or split ring is applied to the slotted end of the housing to clamp the parts in their assembled relationship.

Yet another modification of the invention has been shown in Fig. 11. This anticipates that the retainer be applied about either the socket member or plug member prior to the application of the plug to the socket. As shown in Fig. 11, the retainer comprises a one-piece sleeve-like housing **40** that is applied about the connected plug and socket members. It has an outer end wall **41** formed with an opening through which the socket member is applied with the shoulder of the socket member seated against the end wall and contained within the housing. The cylindrical body of this housing is longitudinally slotted to provide a plurality of fingers **43** with inturned ends **44**. These fingers have an outward springing tendency that causes them, when unrestrained, to diverge, and to be held disengaged from the plug.

Slidable on the housing is a collar or clamp member **45**, also having an outer end wall with opening through which the socket member extends. This collar may be slipped down along the fingers **43** to press them inwardly, thus to engage the feet **44** with the base of the plug so that it will be held against disconnection from the socket.

When the parts **40** and **45** are applied to a socket member as shown in Fig. 11, then the threading of the socket member into a fixture will retain the clamping sleeve against any releasing movement on the part **40**.

This connector retainer may be applied as shown in Fig. 11, or in a reverse position; that is, anchored to the plug and caused to be pressed into holding contact with the shoulder of the socket member.

In Fig. 12 I have shown a device similar to that of Fig. 11, applied to a wall box **46** through an opening **47** to permit the inturned ends of the fingers **43** to be engaged within an encircling channel **48** in a socket member **49**. The clamp member **40**, in this showing, has an extended sleeve-like neck **50** about which a clamp collar **45***x* is slidably mounted. This has a short neck portion **51** slidable on part **50** and a larger cylindrical portion that slips over the clamp **40** to press the parts **43** into the groove **48**.

In Fig. 13 is yet another device for wall box application which contemplates the securing of a plate **52** to the face of the wall box **54**, spaced outwardly therefrom and formed with a hole **55** registering with the socket member **56**. The connector member in this instance is in the nature of a tubular casing **60** divided or split lengthwise so that it may be compressed or expanded. At its inner end it has out-turned flanges **61** and on the inside is a ring **63** adapted to be engaged against the base of the plug to hold it in place by projecting the inner end of the casing into the plate opening. Then the casing may be held by slipping a sleeve **66** onto the outer end of the casing to contact the casing at this end and by reason of the ring **63**, causing the inner end of the case to be expanded and the flanges to hook beneath the plate edge.

Devices of the kind described, embodying the invention in various forms, can be easily and readily applied to or removed from present-day electrical connections, and, when applied, will effectively and safely retain a connection.

Various materials may be employed in the devices, and size and proportion altered or varied to best suit conditions.

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

1. A connection retainer of the character described comprising a pair of semi-cylindrical housings adapted to be cooperatively assembled to form an enclosing sleeve for connected plug and socket members, and having inturned end flanges serving as retainer stops to prevent disconnection of said members, and a clamp collar removably applicable about said housings when assembled to retain them against disassembly.

2. A connection retainer of the character described comprising a pair of cylindrically curved housings, adapted to be cooperatively assembled to form an enclosing sleeve about a connected plug and socket, and having inturned flanges at one end of the sleeve designed to holdingly engage the socket member and having inturned flanges at the other end of the sleeve, spaced beyond the plug, and abutment blocks disposed in the sleeve adjacent said latter flanges and designed to holdingly engage the plug to prevent its withdrawal from the socket, and a clamp collar removably applicable about the said sleeve to retain its parts functionally assembled.

3. A connection retainer as recited in claim 2 wherein said housings are so formed as to give the sleeve a slight taper away from its plug enclosing end and wherein the said blocks are adjustable lengthwise therein in holding engagement with the plug to prevent its withdrawal from the socket, and wherein the blocks will be retained at any position of adjustment by the housings under the clamping effect of the collar.

4. A connection retainer as recited in claim 2 wherein said housings are so formed as to give the sleeve a slight taper away from its plug enclosing end and wherein the said blocks are adjustable lengthwise therein in holding engagement with the plug to prevent its withdrawal from the socket, and wherein the blocks will be retained at any position of adjustment by the housings under the clamping effect of the collar, and a coiled spring disposed between the block ends and the flanges at the plug containing end of the sleeve to press the blocks into holding contact with the plug.

5. A connection retainer of the character de-

scribed comprising a tubular sleeve designed to enclose assembled plug and socket members, and having an inturned flange at one end to holdingly engage the socket member, and having a longitudinal division permitting contraction of the sleeve, abutment blocks in that end of the sleeve adapted to be moved into holding abutment with the plug to prevent its withdrawal from the socket and a clamp collar applied about the sleeve to effect a holding application of force against the blocks through contraction of the sleeve.

ALLEN R. ROSS.

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