

June 19, 1928.

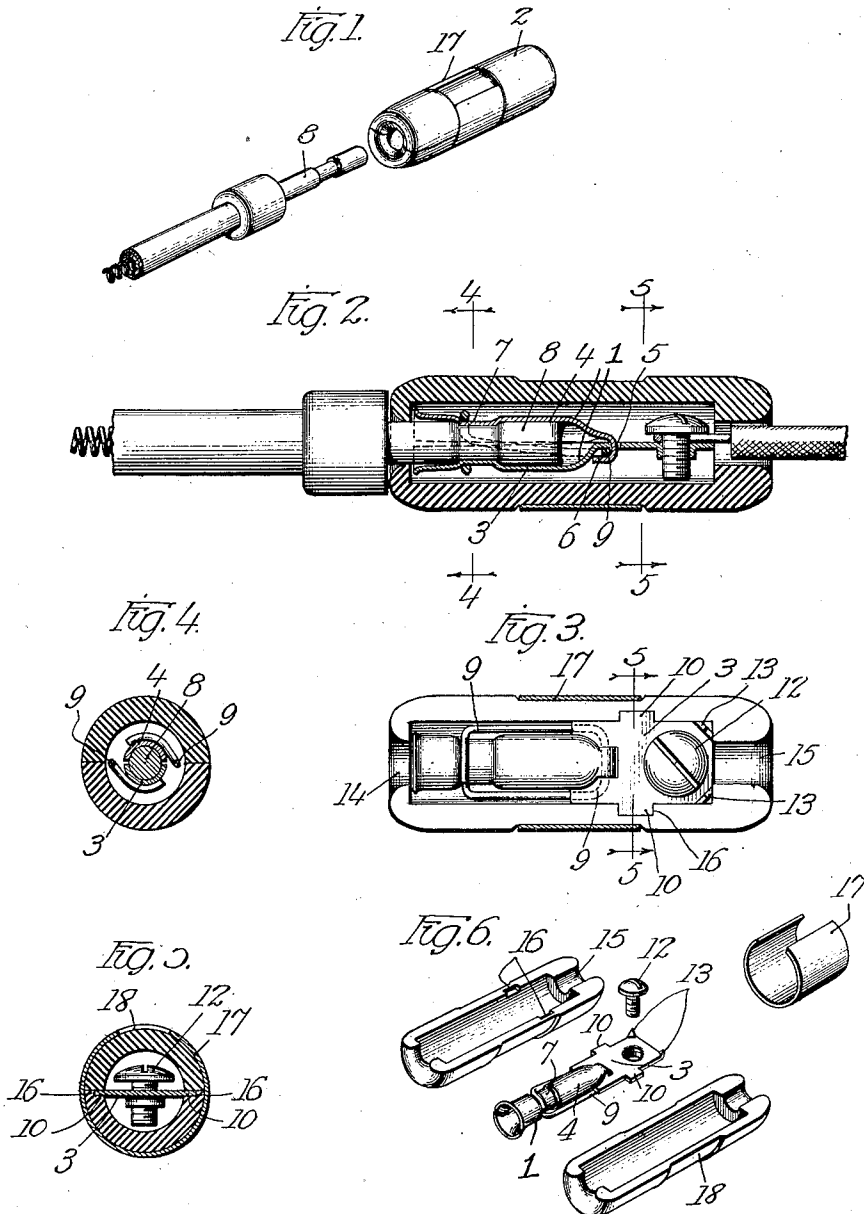
1,674,253

E. N. LIGHTFOOT

CONNECTER

Filed Sept. 27, 1920

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7

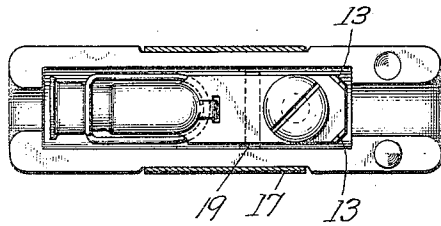


Fig. 8

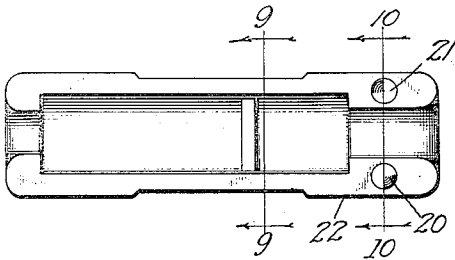


Fig. 9

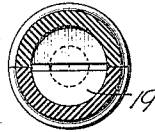


Fig. 10

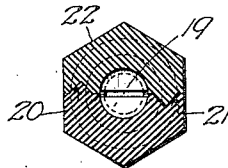


Fig. 11

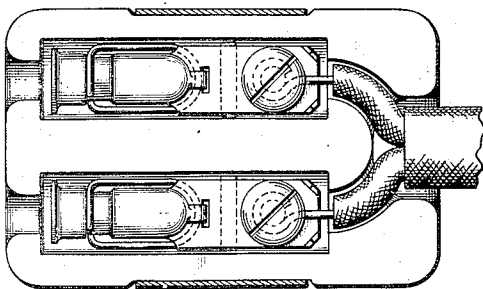


Fig. 12

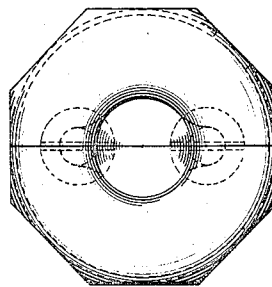
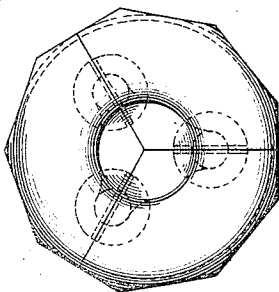


Fig. 13



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UNITED STATES PATENT OFFICE.

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CONNECTER.

Application filed September 27, 1920. Serial No. 412,953.

This invention relates to a connector.

The connector to which the invention particularly applies comprises in general a tubular casing having a contactor positioned therein.

The invention is particularly applicable to connecting plugs or sockets attached to electric cords or conductors although not limited to such use.

The objects of the invention are:

To provide a highly efficient, simple and inexpensive connector of few parts easily and quickly assembled and disassembled for inspection and replacement of parts.

To provide a connector, the insulating casing of which may be held together without screws, bolts or other means passing there-through.

To provide a small compact connector having conducting parts thoroughly insulated to protect users against injury.

Other objects and advantages will hereinafter appear.

In the drawings:

Figure 1 is a perspective of the socket connector and a cooperating plug terminal;

Fig. 2 is a longitudinal vertical section through the socket connector;

Fig. 3 is a longitudinal horizontal section through the connector;

Fig. 4 is a transverse section on the line 4—4 of Fig. 2;

Fig. 5 is a transverse section on the line 5—5 of Fig. 2;

Fig. 6 is an exploded perspective of the connector.

Fig. 7 is a horizontal longitudinal section through a connector, having a ledge in the casing for preventing lateral displacement of the contactor;

Fig. 8 is a top plan of one section of the casing;

Fig. 9 is a vertical section on line 9—9 of Fig. 8 with the other casing section in place thereon;

Fig. 10 is a vertical section on line 10—10 of Fig. 8 also showing the other casing section;

Fig. 11 is a horizontal longitudinal section through a connector having two contactors;

Fig. 12 is an end elevation of a connector having two contactors; and

Fig. 13 is an end elevation of a connector having three contactors.

Figs. 1 to 6 will first be described.

The connector comprises a tubular contactor 1 and a tubular insulating casing 2. The contactor 1 is formed of two conducting elements or shoes 3 and 4, which are hinged together by a tongue and groove connection.

The conducting shoe 3 is provided with an opening 5 through which extends the rearward projection 6 of the conducting element 4, whereby the two shoes are hinged together. The forward end of the conducting elements 3 and 4 are arranged so that they cooperate to form a tubular socket.

The tubular socket is provided with a peripheral indentation 7 which may cooperate with an indentation in the plug 8 to hold the same within the socket.

The two shoes of the tubular contactor are resiliently held together by a U-shaped spring 9, the base of which is fastened to the contactor by the projection 6 folded thereover. The spring 9 may be made of any suitable material. Steel is particularly suitable for its temper is not easily affected by heat.

The free ends of the spring 9 are bent laterally toward each other and rest in the groove 7. Thus the laterally bent free ends of the spring 9 embrace the two shoes of the tubular contactor and the spring resiliently holds the same in socket forming relation.

The shape of the spring is such that it occupies but little space. It is supported at a point removed from the contacting surfaces of the contactor, the legs of the U-shaped spring are out of contact with the shoes, and the laterally extending ends are the only portions of the spring which rest against the shoes at or near the contacting surfaces. Consequently, the shape and positioning of the clamping and positioning spring 9 is such that it is protected against high heat, and the life thereof is prolonged.

The spring 9 yieldingly holds the contact shoes 3 and 4 in alignment in socket forming relation and yieldingly presses the shoes together.

When the contact pin 8 is inserted in the socket contactor, the shoes thereof are forced apart against the action of the spring 9 and the shoes snap into place on the pin when the depression 7 of the contactor slides into place in the depression in the contact pin 8. The tension of the spring 9 is sufficient to insure good electrical contact be-

tween the contact pin and the socket contactor.

When removing the connector from the contact pin, such force must ordinarily be employed to withdraw the depression 7 of the contactor from the depression in the contact pin that contact between the pin and socket is broken rapidly thereby reducing the arcing between the same.

The rear extension of the conducting shoe 3 is provided with lateral projections or fins 10 which cooperate with the casing and centrally position the contactor therein.

The rear extension of the shoe 3 is also provided with a threaded opening for the reception of a terminal screw 12 by which a conductor or cord from a source of current supply may be connected with the contactor.

The rear extension of the conducting shoe 3 is provided with upstanding projections 13 which assist in preventing lateral displacement of the casing in one direction. Lateral displacement in the other direction is prevented by the flared opening at the end of the tubular or socket contactor.

The casing 2 is a tubular split casing made of insulating material.

The casing has restricted openings 14 and 15 at the respective forward and rear ends. These restricted openings thus provide shoulders at each end of the casing which cooperate with the flared opening of the tubular contactor and the upstanding projections 13 thereof whereby lateral displacement of the parts of the insulating casing is prevented.

The inner wall of the insulating casing is provided with notches 16 for the reception of the fins 10 of the contactor whereby the contactor is centrally positioned within the casing and lateral and longitudinal displacement thereof is prevented.

The casing is resiliently held together by means of a split spring collar 17 which embraces the casing and rests in a circumferential peripheral groove 18 therein and clamps the split casing together.

The collar 17 is placed in position about the casing by sliding it over the end of the casing and moving it longitudinally thereon into the groove 18. This groove prevents accidental displacement of the resilient collar 17.

The resilient metal clamping band 17 may be placed in position on the casing and removed therefrom without the use of tools, whereby access to the conducting parts of the connector may be had quickly.

By employing the clamping collar 17 for holding the casing together, the usual fastening screws extending through the casing are eliminated and no weakening openings through the wall of the casing are necessary. Thus the casing is stronger and

more durable, and the conducting parts enclosed therein are more thoroughly insulated.

Thus there is produced a simple, durable and inexpensive connector of few parts, easily and quickly assembled and disassembled.

Figs. 7 to 10 show a connector having a modified form of casing wherein no fins on the contactor are necessary to prevent lateral displacement thereof.

The two parts of the casing are formed exactly alike. A transverse wall or ledge 19 is arranged within each part of the casing. These walls or ledges rest against opposite sides of the rear extension of the contact shoe 3 and cooperate in centrally positioning the contactor within the casing. Thus the walls or ledges 19 hold the contactor against lateral displacement.

The upstanding projections 13 at one end and the flared opening at the other end of the contactor cooperate with the shouldered openings in the ends of the casing 2 and prevent longitudinal displacement of the contactor.

Projections 20 and cooperating depressions 21 in the opposing faces of the two parts of the casing cooperate with the resilient clamping collar 17 and hold the casing parts in cooperating enclosing position.

As illustrated in Fig. 10, the rear end 22 of the casing is made polygonal and larger in cross section than the forward end to provide a better gripping surface. This larger end also decreases the possibility of the accidental removal of the resilient clamp from the casing.

Figs. 11 and 12 show a connector having two contactors positioned between the two parts of the split insulating casing held together by a spring collar.

Fig. 13 shows a connector in which the split insulating casing is arranged in three parts. This connector is arranged to accommodate three contactors, each of which is positioned between adjacent parts of the insulating casing held together by a spring collar.

The embodiments shown and described are for the purpose of illustration only. The drawings and description are therefore to be considered in an illustrative and not in a limiting sense, for it is obvious that many modifications and adaptations will readily occur to and be made by those skilled in the art without departing from the spirit and scope of the invention.

The invention claimed is:

1. A quick detachable socket connector comprising a two-part tubular insulating casing having a notched inner wall, a resilient socket contact arranged within the casing having a lateral fin registering with the notch, said contact comprising parts

hinged together and a loop spring having overlapping arms to embrace said parts, and resilient means holding the casing in enclosing position.

5 2. A quick detachable connector comprising a two-part tubular casing, a two-part tubular contact arranged therein and having projections engaged by the casing parts to hold the contact against longitudinal displacement, said contact parts being hinged
10 together and embraced by an elongated single loop spring, and a resilient split collar encircling the casing and longitudinally removable therefrom.

15 3. A quick detachable connector comprising a two-part tubular insulating casing having a notched inner wall and a wide circumferential depression in the outer surface thereof, a contact socket having hinged parts
20 spring biased toward each other arranged within said casing and having projections registering with the notches to hold the contact against longitudinal and lateral displacement, and a curved plate or band of
25 corresponding width adapted to be forced into said depression for holding the casing in enclosing position.

4. A connector comprising a two-part tubular contact, one part having an opening
30 and the other a projection extending through the opening whereby the parts are hinged together, a wire loop having resilient arms engaging said parts externally for maintaining the same in socket forming relation, and a split tubular insulating casing
35 therefor.

5. A connector comprising a two-part tubular contact, one part having an opening and the other a projection extending
40 through the opening whereby the parts are hinged together, resilient arms supported by said hinge for maintaining the parts in

socket forming position, and a tubular insulating casing enclosing the contact and having a restricted opening at each end
45 through which a conductor may extend.

6. A connector having a two-part tubular contact, one part having an opening and the other a projection extending there-
50 through and forming therewith a hinged connection, a spring clamped within said hinge and having arms engaging the respective parts of said contact, a split tubular enclosing casing for the contact, and resilient means for holding the casing in en-
55 closing position.

7. A connector having in combination a split tubular insulating casing, a two-part tubular plug socket contact arranged therein, a hinge connection between said contact
60 parts, and a U-shaped spring secured by said hinge connection, the arms of said spring being in bent and adapted to exteriorly engage and hold the contact parts in socket forming relation.
65

8. A connector having in combination a split insulating casing, a two part hinged socket contactor, a U-shaped spring having
70 its free ends bent to embrace the respective contactor parts, and resilient means holding the casing in enclosing position.

9. A connector having in combination a two part socket contactor, one part having an opening and the other a projection extending therethrough and forming therewith
75 a hinged connection, a U-shaped spring engaged by and interlocked with the projection and having its free ends bent to embrace and hold the contactor parts in socket forming relation, and a tubular insulating casing
80 enclosing the same.

In witness whereof, I have hereunto subscribed my name.

EDWIN N. LIGHTFOOT.