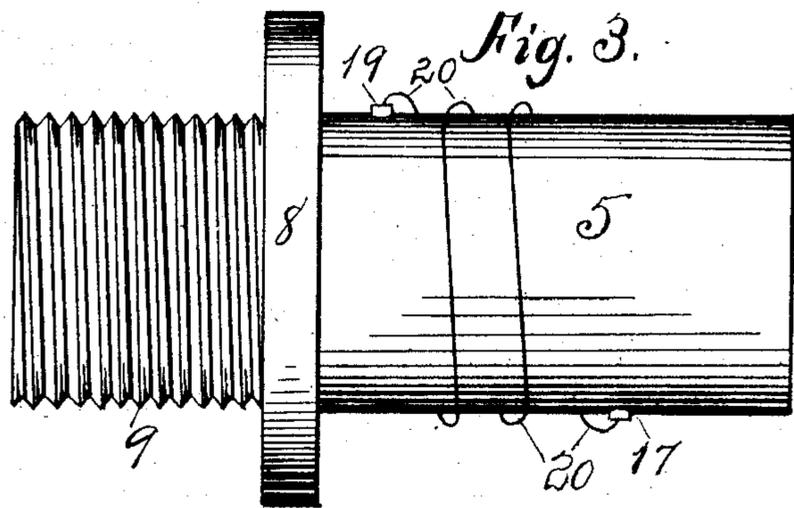
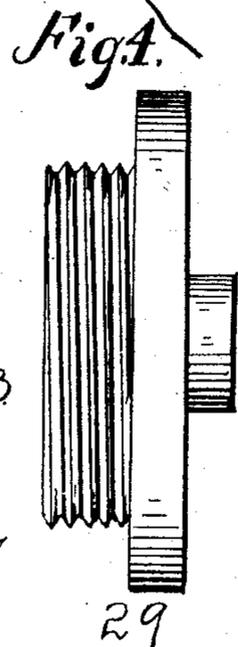
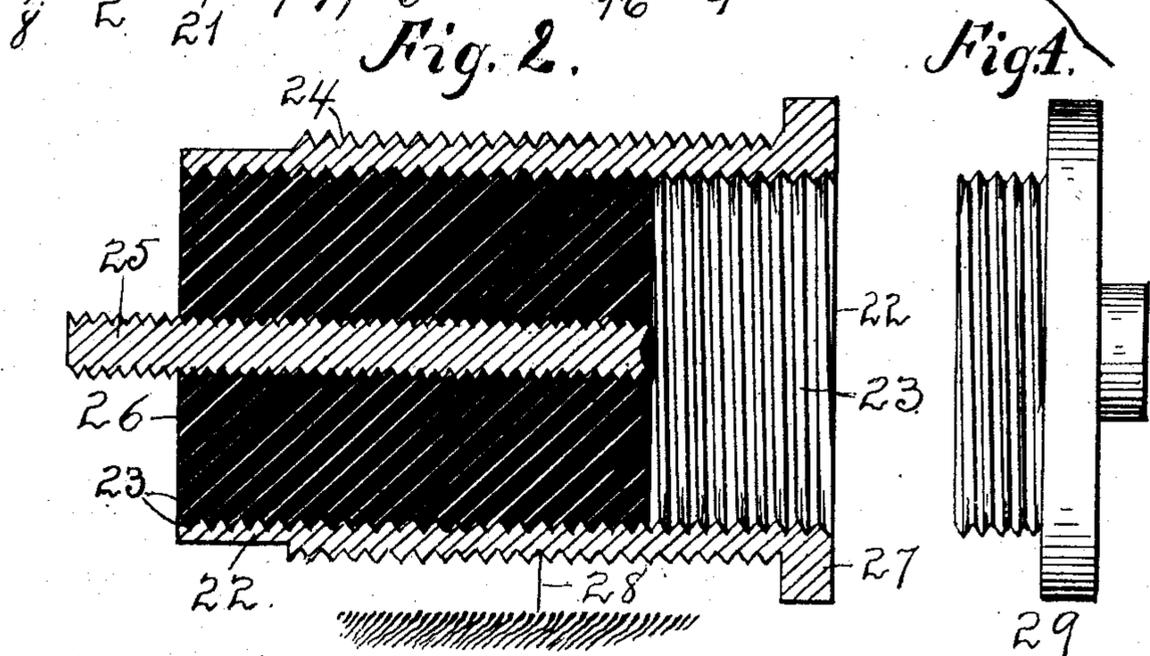
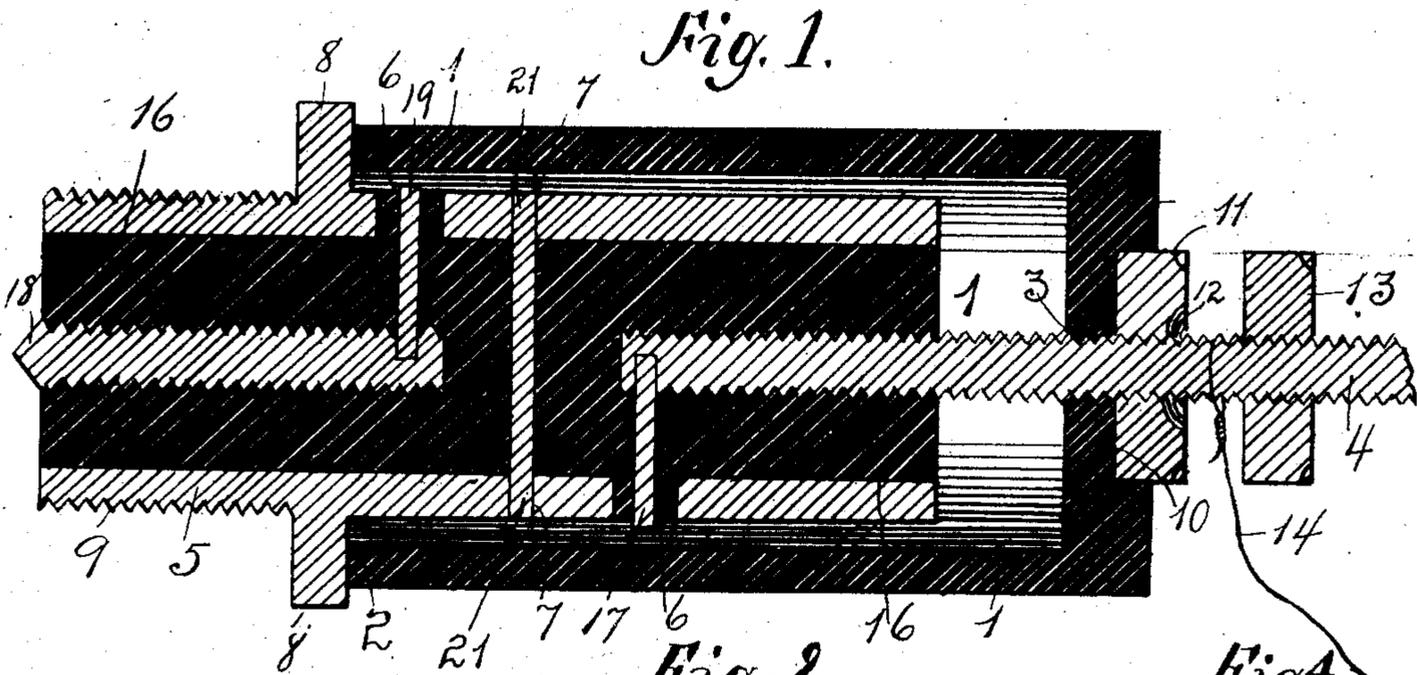


F. C. WOODS.
COMBINED FUSED CONNECTOR AND LIGHTNING ARRESTER FOR
ELECTRIC WIRES.

APPLICATION FILED FEB. 27, 1907.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FREDERICK C. WOODS, OF GALESBURG, ILLINOIS.

COMBINED FUSED CONNECTOR AND LIGHTNING-ARRESTER FOR ELECTRIC WIRES.

No. 883,272.

Specification of Letters Patent.

Patented March 31, 1908.

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To all whom it may concern:

Be it known that I, FREDERICK C. WOODS, a citizen of the United States, residing at Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Combined Fused Connector and Lightning-Arrester for Electric Wires, of which the following is a specification.

My invention relates to devices of the character and for the purpose above stated, and while it is particularly applicable and primarily adapted to telephone systems I desire it understood that it is intended for use wherever suitable and practical.

Heretofore it has been possible in connectors of this character to connect the line wire directly to the cable-end of the contact or contact point, no fuse being interposed therebetween. Such connection being made, either by inadvertence, accident or mistake, in the event of lightning or other abnormal currents transpiring great injury or indeed destruction of the cable-wires would result.

The main object of the invention is to obviate the possibility of such occurrence by providing a device of the nature before related in which it is impossible to make such connection.

It is desirable at times when the cable-end is not in use, to seal said end from exposure to the elements in order to prevent leakage of the electric current to earth; and a further object of the invention is to provide a simple, novel and effective means of preventing such leakage.

In telephone cable work what is known as "cross-talk" frequently occurs on terminals by reason of leakage of current from one contact-point to another; and a still further object of the invention is to provide an effective means whereby said leakage is rendered impossible.

Other objects will appear as the nature of the invention is better understood.

To the end of carrying out these main ends and objects the invention consists in novel structural features and combinations of devices and means, the operation of which separately and in combination will be found hereinafter fully described and set forth in the claims hereto appended.

Mechanism showing the structural features, arrangement, connection and mutual relationship of the several parts of my improvement is illustrated in the accompanying drawings, in which:—

Figure 1 is a vertical, longitudinal section of the cylindrical housing and adjacent and contained parts; Fig. 2, a similar view of the tubular envelop and parts inclosed therein; Fig. 3, an elevation of certain parts shown at Fig. 1, and Fig. 4, an elevation of the anti-leakage plug.

Referring to the drawing by numerals, the same one indicating the same part in the different figures thereof, 1 indicates a cylindrical housing of fiber or other non-conducting material, one of its ends, 2, being open and the other provided with a central aperture 3 for the reception of a contact-point-member 4 presently described. A seat 10 for a lock-nut 11 is provided at the outer end of the housing and is cupped at 12 for the reception of solder or like material to prevent tampering by unauthorized persons with the parts contained within the housing. Another nut, 13, is threaded on the projecting end of the contact member 4 and together with the nut 11 when they are brought into proximity securely hold the line-wire 14 to the contact-member 4 in an evident manner. Any other means of attaching the line-wire to said contact member may be employed if preferred.

5 indicates a tubular metallic container provided with apertures 6, 6 and 7, 7 and has intermediate its ends an annular shoulder 8. At its inner end it is provided with peripheral threads 9. Non-conducting or insulating material 16 of such density and strength that it will resist either pressure or tensile strain entirely fills the container 5 and the aforesaid apertures or foramens 5 and 7.

The contact member 4, which is preferably threaded throughout its length is screwed centrally and longitudinally a suitable distance into said insulation 16, and fixed thereto and projecting through said insulation and a slight distance beyond the container through one of the apertures 6,) is a radial pin, 17, also of metal. In line with the member 4 is a convex pointed or male contact member 18 similarly fixed in the insulation 16 but at the inner or proximal end of the container, and carries a radial pin 19 in the same manner as does the member 4. For the purposes of this specification the members 4 and 18 may ordinarily be considered as one or a unit, inasmuch as they are connected by means of a fuse 20 soldered at its ends to the radial pins 17 and 19. It will be evident that because of the contact member 4 being securely threaded into the

insulation 16 and by reason of the latter being securely held in place within the container by the through-pin 21, and the proximal end of the housing abutting against the annulus 8, said container and housing may be firmly held together by adjustment of the lock-nut 11 in an evident manner, and that when so united no moisture can penetrate to cause trouble or injury to the parts within said casing and thereby render the instrument defective.

A metallic enveloping tube 22 provided with interior threads 23 is adapted to be screwed onto the threaded end 9 of the container 5 a suitable distance, such distance being that which will permit the concaved end of a female contact member 25 to come directly into juxtaposition with the convex or conical end of the member 4, said member 25 being disposed longitudinally and centrally of an insulation 26 preferably threaded into or partly into the internal threads of the envelop 22, which latter is provided with an annular shoulder 27 at its inner end. The member 25 is preferably threaded into the insulation 26 as shown, but it may be placed therein in any suitable manner by which it will be securely retained in position. It is important that the male and female contact members 18 and 25 be centered in their respective insulations to form a perfect contact for the unimpeded flow of the current. The cable wire, not shown, may be fixed to the projecting end of the member 25 in any ordinary or desired manner.

Abnormal currents will be carried off by any preferred means (not shown) which may be screwed on or otherwise fixed to the periphery 24 of the envelop 22, it being grounded as indicated by the numeral 28, Fig. 2. This will be further explained in the description of the operation of the invention.

As has been hereinbefore stated it is desirable when the cable is not in use that its free end be shielded from the elements. This I accomplish by screwing a non-leakage plug 29 (see Fig. 4) to engage the threads 23 of the envelop 22 in an evident manner.

I shall now proceed to describe the operation: The threaded end of the container 5 is brought into engagement with the threads 23 of the envelop 22 and screwed therein until the ends of the male and female members 18 and 25 contact to form a perfect union because of their centrality as hereinbefore stated. The working current will flow from the line wire to the insulated member 4, thence through its radial pin 17 to and through the coiled fuse 20 to and through the pin 19, thence to the contact member 18 and thence to the female member 25 in the envelop 22, from whence it is transmitted to the cable, or vice versa.

Foreign currents, for instance lightning, trolley or electric light currents, striking the

wire and seeking to enter the cable or instrument will follow the same path as does the working current until it reaches the fuse, when by reason of its peculiar nature it will either melt the fuse or piercing the insulation and jumping to the metallic container 5 will be carried by the conductivity thereof to the envelop 22 and thence to the metal fixture hereinbefore referred to and thence grounded or carried to earth. It will be manifest that this construction furnishes an effective means of preventing injury to the cable or instrument with which it is connected.

It is known to those skilled in the art of telephony that a heat or "sneak" coil consisting of a plurality of turns of wire may be used to arrest the flow to telephone wires of abnormal currents such as electric light and trolley currents, the heat generated by such currents being great enough to fuse the wires or parts of wires used in the construction of such coils, thereby opening the circuit of which said coil is a part. This may be accomplished in my device by increasing the number of turns or coils of the fuse-wire to a number sufficient to accomplish such purpose.

By the element-proof construction of the container, by means of the housing, and element proof construction of the envelop shown and described, liability of current leakage is obviated, first, when the parts shown at Fig. 1 are in use, by the union of said parts and the tubular envelop, and second, when said first enumerated parts are not in use, by the employment of the anti-leakage plug, either of which is equally effective.

While I have illustrated and described the preferred embodiment of the invention it will be understood that without departing from the essential spirit and scope thereof or sacrificing any of its advantages, it is susceptible of change as regards form, proportion, detail, construction, organization, and to some extent the mutual cooperation and combination of its parts. For instance, the radial pins may be otherwise located than where shown and the fuse-wire connected to the members 4 and 18 at any point within the housing.

Having thus set forth the construction and operation, the purposes and advantages of my invention, I claim as new and desire to secure by Letters Patent the following, to-wit:—

1. A device of the character described including a container, insulating material therein, contact members embedded in said material and coiled means exterior to the container for connecting said members whereby electric current may flow therebetween.

2. A device of the character described including a container, insulating material therein, spaced contact-members embedded in

said material and a coiled fuse exterior to the container for connecting said members.

3. A device of the character described including a container, insulating material 5 therein, contact members embedded in said material and a coiled fuse exterior to the container connecting said members.

4. A device of the character described including a housing of non-current-conducting 10 material, a metal container secured thereto, insulating material therein, contact members embedded in said material, and coiled means exterior to the container for uniting them 15 whereby electric current may flow from one to the other.

5. A device of the character described including a metallic container, foramens there- 20 through, insulating material within said container, centrally disposed contact-members embedded in said material, and radial pins projecting from said members through said 25 insulation and foramens.

6. A device of the character described including a current-conducting container, aper- 25 tures therethrough, insulating material within said container, a fastening-pin through said material and container, centrally located contact members embedded in said material, 30 radial pins projecting from the contact members through said insulation apertures and means for uniting them.

7. A device of the character described including a non-current-conducting housing, a 35 container partly therewithin, insulating material within said container, a threaded contact member embedded in said material, its end projected through the end of the hous- 40 ing, and a lock-nut threaded thereon whereby said container and housing are held in engagement.

8. In a device of the character described, a container formed of current-conducting material, insulating material therein, contact

members embedded in said material and spaced a distance apart, and a coiled fuse 45 connecting said contact members and located exteriorly of the container.

9. In a device of the character described, a container formed of current-conducting ma- 50 terial, insulating material therein, contact members embedded in said material and spaced a distance apart, a pin fixed to each thereof and projecting through said material 55 and container, and a coiled fuse connecting said pins.

10. The combination with a current con- 60 ducting container, insulating material therein, centrally disposed and spaced contact members embedded in said material and a fuse connecting them, of a current carrying 65 envelop adapted to engage said container, insulating material therein and a centrally disposed contact member embedded in said last named material and adapted to be brought into engagement with the first named 65 contact members.

11. The combination with a current-con- 70 ducting container and spaced insulated contact members therein, a fuse connecting them and a line-wire, of a current-conducting 75 envelop, an insulated contact member therein and a ground connection secured to said envelop.

12. The combination with an insulated housing, a current-conducting container se- 75 cured thereto and partly inclosed thereby, insulated and spaced contact members in said container, a fuse connecting them, and a line-wire, of a current conducting envelop engaging said container, an insulated contact 80 member therein, and a ground connection secured to said envelop.

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Witnesses:

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