

No. 775,732.

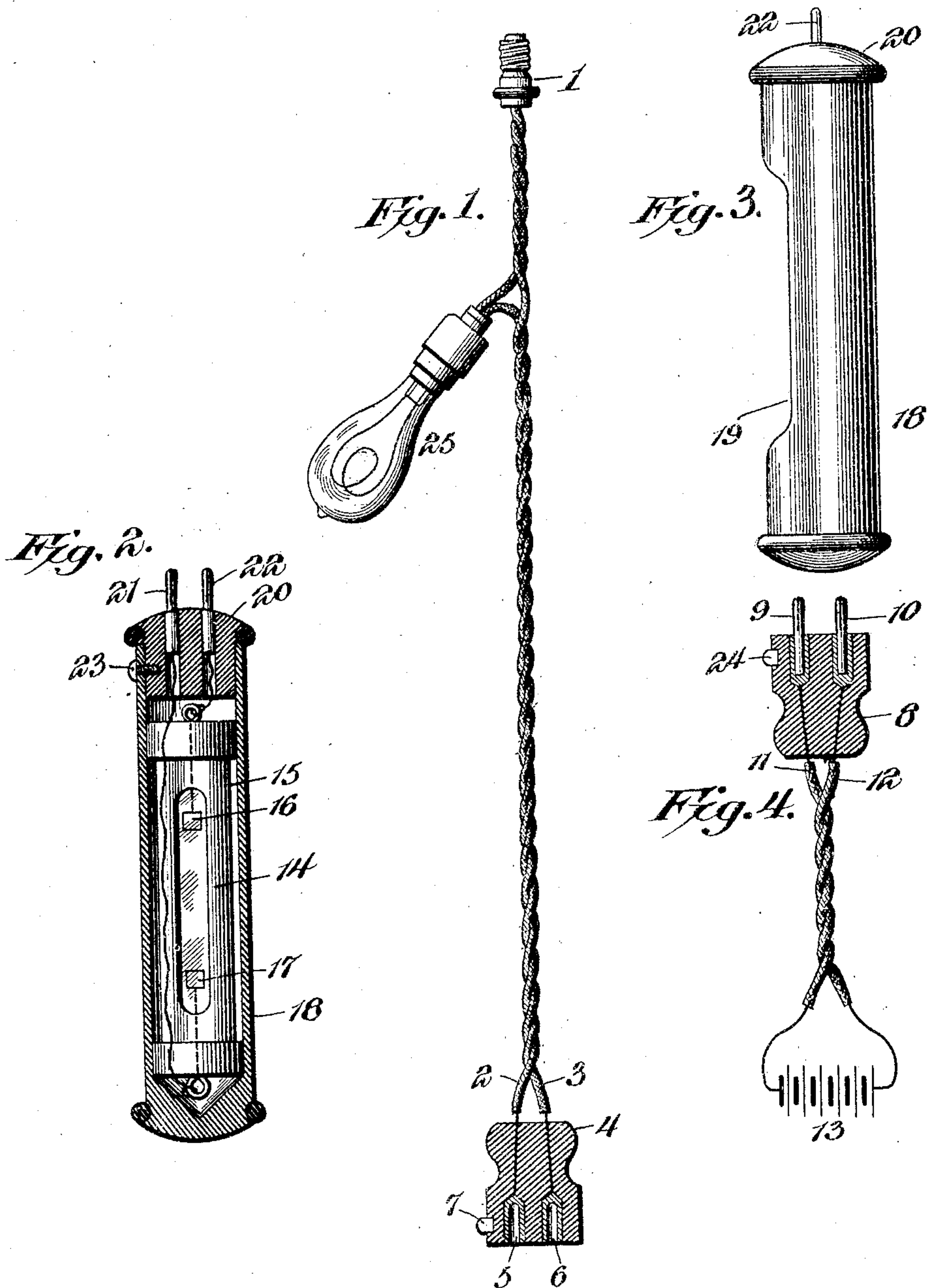
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H. G. PAPE.

BATTERY CHARGING APPARATUS.

APPLICATION FILED MAY 17, 1904.

NO MODEL.



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BATTERY-CHARGING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 775,732, dated November 22, 1904.

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To all whom it may concern:

Be it known that I, HERMANN G. PAPE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a new and useful Battery-Charging Apparatus, of which the following is a specification.

My present invention relates to a novel apparatus for charging secondary batteries, particularly small pocket-batteries for audiphone sets. The most available source of electrical energy for this purpose is the lighting system of a dwelling, for instance, and the apparatus therefore embraces means whereby an electrical connection may be effected between an incandescent-lamp socket and the battery to be charged. It will be understood, however, that in charging secondary batteries it is necessary to pass therethrough a current of predetermined polarity, and as it is obviously impossible ordinarily to determine the polarity of the terminals of the socket my charging apparatus contemplates the provision of means whereby the polarity of the current may be determined prior to the attachment of the battery.

The object of the invention is to provide simple charging means comprising what may be known as a "charging-cord," a single connector or plug attached to the cord, a polarity-indicator for determining the polarity of the current, and a battery-connector which may be connected to the connector of the charging-cord in either of two positions for the purpose of passing a current of proper polarity through the battery irrespective of the polarity of the charging-current.

A further object of the invention is to equip both connectors and the polarity-indicator with terminal-indicators designed to facilitate the connection of the battery and charging-cord in proper relation.

Subordinate to the several recited objects are others, which will appear during the succeeding description of the illustrated embodiment of the invention.

In the accompanying drawings, Figure 1 is an elevation of my charging-cord with its connector shown in section. Fig. 2 is a sec-

tional elevation of the polarity-indicator. 50 Fig. 3 is a side elevation of the latter; and Fig. 4 is a conventional illustration of the battery, showing the battery-connector in section.

Like numerals are employed to designate 55 corresponding parts in the several views.

1 indicates a connecting-plug of ordinary form designed to be screwed into a lamp or other socket electrically connected to a source of electrical energy. From the plug 60 1 extend a pair of covered wires 2 and 3, preferably twisted together to form a flexible charging-cord, at the lower end of which is attached a connector 4, provided with a pair of like terminals 5 and 6, preferably female 65 in form and having connection, respectively, with the wires 2 and 3. Whether the terminals 5 and 6 are positive or negative will depend upon the polarity of the particular socket to which the plug 1 is connected; but 70 in order to distinguish these terminals from each other the connector 4 is equipped with a terminal-indicator 7, the character of which is unimportant, but may be a projection extending from the connector opposite one terminal—as, for instance, the terminal 5. 75 Designed for connection to the connector 4 is a similar battery-connector 8, equipped with a pair of like terminals 9 and 10, preferably of male form, connected to terminal wires 11 80 and 12 of the secondary battery 13 to be charged.

By inserting the male terminals 9 and 10 of the battery-connector into the female terminals 5 and 6 of the cord-connector a circuit will obviously be closed through the battery. As heretofore stated, however, this connection must not be effected in a haphazard manner, because the passage of a current of a wrong polarity through the battery would 90 not only be ineffective to discharge the same, but would have a positive deleterious effect. For this reason it is necessary to determine the polarity of the charging-cord before the latter is connected to the battery, this end 95 being here preferably accomplished by the aid of a polarity-indicator 14 of any approved type, but preferably of that well-known form

which includes a tubular receptacle 15, containing a liquid in which are immersed a pair of separated electrodes 16 and 17. When the electrodes 16 and 17 are placed in circuit, the current passes through the liquid and changes the color of the latter adjacent to one end or the other of the tube, according to the polarity or direction of flow of the current. To facilitate the attachment of the polarity-indicator to the charging-cord, I inclose said indicator in a hard-rubber casing 18, having an opening 19, through which the indicator may be viewed, and closed at one end by a plug or connector 20, equipped with a pair of male terminals 21 and 22, electrically connected to the electrodes 16 and 17 and designed to be inserted into the female terminals 5 and 6 of the cord-connector 4. One of these terminals of the polarity-indicator is distinguished from the other by a terminal-indicator 23, which in this instance is in the form of a screw, serving as a retaining device for the plug or connector 20.

When it is desired to charge the battery, the plug 1 is screwed into a convenient socket and the polarity-indicator is attached to the connector 4, the terminals 21 and 22 of the former fitting into the terminals 5 and 6 of the latter. The circuit being thus closed through the indicator the liquid at one end or the other thereof will turn red, thus indicating the polarity of the current. The polarity-indicator is now detached and the connector 8 of the battery is attached to the connector 4 in either position, according to the ascertained polarity. This attachment is facilitated by a terminal-indicator 24 in the form of a projection extending from the connector 8 adjacent to the battery-terminal 9, which corresponds with the indicator-terminal 21. Thus if the ascertained polarity is such that the battery should be connected in a manner corresponding to the connection of the polarity-indicator the battery and cord connectors 8 and 4 are brought together with the terminal-indicators 7 and 24 in registering relation. If, however, the opposite polarity has been indicated, the connector 8 is reversed, so that the terminal-indicators 7 and 24 will not register. In other words, the battery-terminals 9 and 10 may be connected with the cord-terminals 5 and 6, respectively, or the battery-connector may be turned so that its terminal 10 will engage the terminal 5 and its terminal 9 the terminal 6 of the cord connector.

Attention may now be directed to the fact that by providing the cord and battery connectors each with two terminals of similar form, but of different form from the terminals of the other connector, the battery may be properly connected with the source of electrical energy no matter what the polarity of the current may be, and, furthermore, that by

this arrangement and by the provision of the terminal-indicators proper connection may be effected without the necessity for the employment of a plurality of cord connectors and without danger of passing a current of wrong polarity through the battery. There is a distinct further advantage in having both battery-terminals of male form. These secondary batteries are ordinarily inclosed in a small casing adapted to be carried in the pocket. The connector 8 is fitted in the top wall of the casing, which wall is also provided with small openings for the escape of gas liberated by the decomposition of the battery elements. Frequently the gas escapes in the form of bubbles, which settle within and tend to corrode the walls of a socket or female terminal. It therefore becomes necessary to frequently clean the socket to remove the corrosion, and this naturally results in enlarging the opening, so that it will ultimately be too large for the male terminal received by it and the contact will be imperfect. Where, on the contrary, both battery-terminals are of male form there are no metal cavities to be coated or corroded, and any deposit which may be received by the projecting male terminals may be readily wiped off before material injury results.

As the voltage of the current of a lighting system is ordinarily high, I provide the charging-cord with a resistance device, which may be in the form of an incandescent lamp 25 in the line of one of the wires 2 or 3; but this feature may be included or omitted, as desired.

It is thought that from the foregoing the construction, arrangement, and mode of manipulation of my charging apparatus will be clearly understood; but while the present embodiment of the invention appears at this time to be preferable, I desire to be understood as reserving the right to effect such changes, modifications, and variations of the illustrated structure as may come fairly within the scope of the protection prayed.

What I claim is—

1. In a battery-charging apparatus, the combination with a charging-cord having a single connector provided with terminals of like form, of a battery having a single connector provided with terminals of like form, but unlike the terminals of the cord-connector and arranged to be connected in interfitting relation therewith, and a polarity-indicator having a pair of terminals corresponding in form with the terminals of the battery-connector, the polarity-indicator and each connector having a terminal indicator to facilitate the proper connection of the parts.

2. In a battery-charging apparatus, the combination with a charging-cord having a single connector provided with female terminals, of a battery having a connector provided

with a pair of male terminals, and a polarity-indicator having a pair of male terminals, the polarity-indicator and each connector having a terminal-indicator to facilitate the proper
5 connection of the parts.

3. In a battery-charging apparatus, the combination with a charging-cord having a pair of flexible connectors, a plug at one end thereof, and a single connector provided with
10 female terminals at the other end of the cord, of a battery having a single connector provided with a pair of male terminals, each of said connectors having a terminal-indicator facilitating the proper connection of the bat-
15 tery and charging-cord, a polarity-indicator,

a protective casing therefor closed at one end by a plug equipped with a pair of male terminals in electrical connection with the electrodes of the polarity-indicator, and a terminal-indicator exposed on the exterior of the
20 casing and serving additionally as a securing device for the plug.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

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Witnesses:

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