

Dec. 7, 1926.

1,610,205

E. C. FRITTS

BATTERY CHARGING APPARATUS

Filed Nov. 5, 1923

2 Sheets-Sheet 1

FIG - 1.

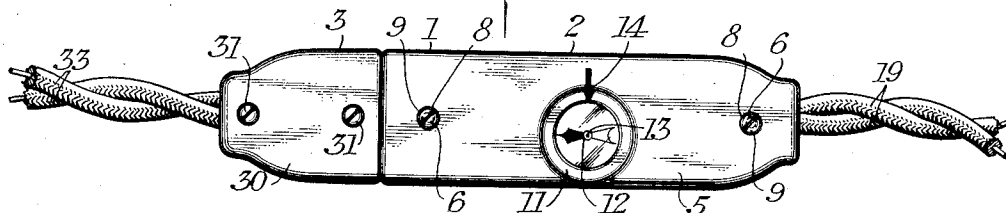


FIG - 2.

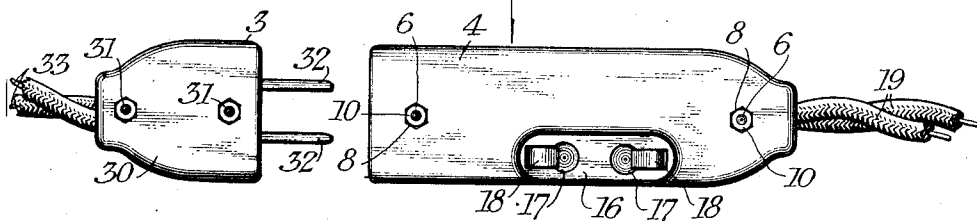
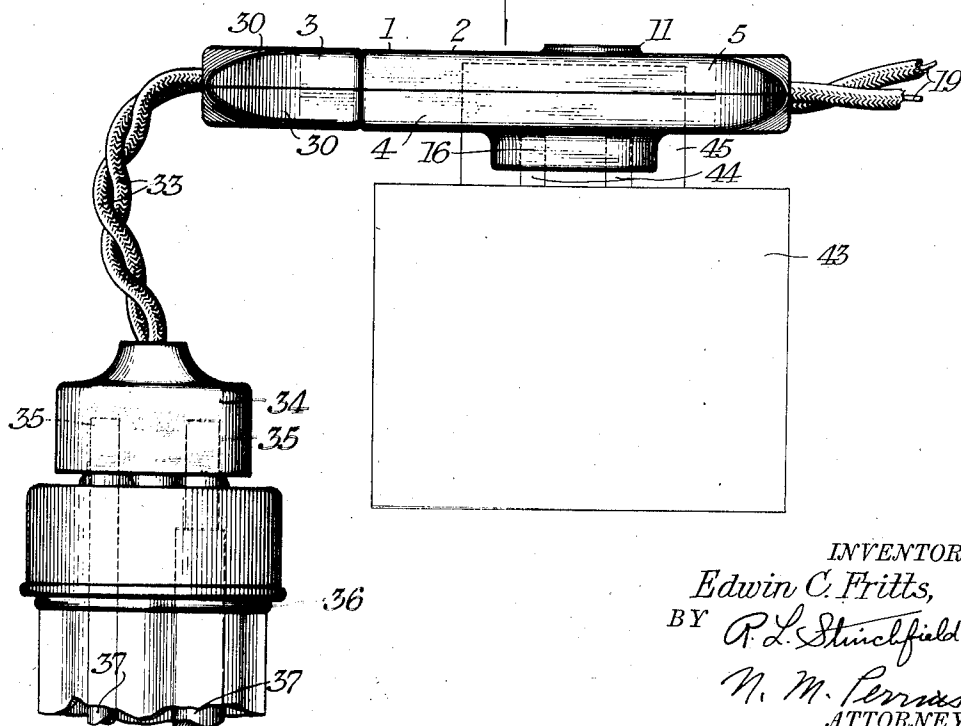


FIG - 3.



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FIG - 4 -

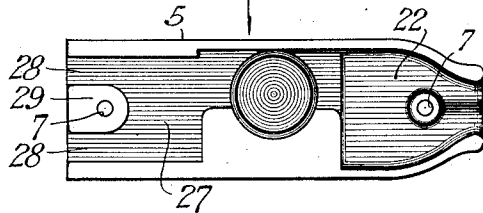


FIG - 5 -

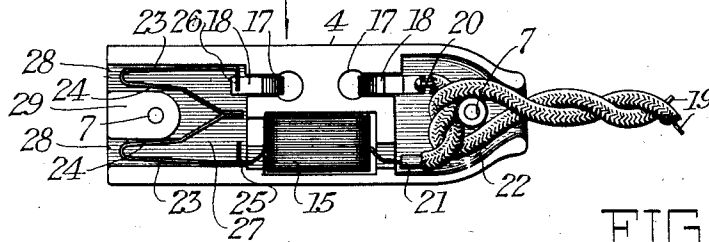


FIG - 6 -

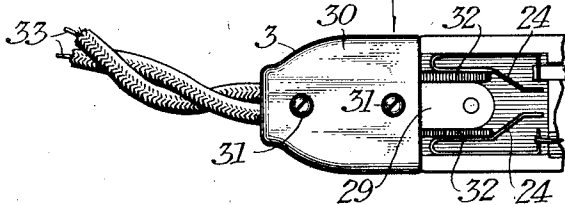


FIG - 8 -

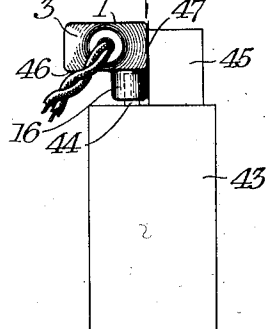
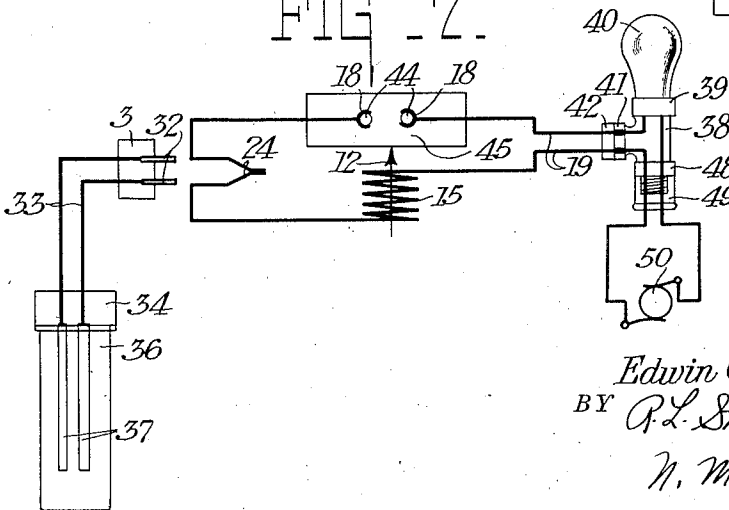


FIG - 7 -



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BATTERY-CHARGING APPARATUS.

Application filed November 5, 1923. Serial No. 672,800.

My present invention relates to apparatus used in charging a storage battery.

The principal object of my invention is to provide an apparatus that may be used by a person totally unskilled in electrical apparatus. Most devices for this purpose are intended for use by electricians, or by amateurs more or less skilled in the radio or automobile arts or the like. My apparatus, however, is intended for use by a person not accustomed to working with mechanical or electrical apparatus and particularly is designed for a storage battery used to drive a motor for a portable motion picture machine of such simplicity that it may be operated by any unskilled person of ordinary intelligence.

Other objects are that the apparatus may be used with direct or alternating current, that it will indicate whether the polarity of the connection is right or wrong, that it will be inexpensive to manufacture, of small size and convenient in every respect. Still other objects will appear in the following description, in which reference is made to the accompanying drawings, wherein the same reference characters designate the same parts throughout.

Fig. 1 is a plan of the principal unit of my apparatus;

Fig. 2 is a bottom view thereof, its two separable parts being disconnected;

Fig. 3 is an elevation thereof showing the unit connected with a battery and a rectifier;

Fig. 4 is a bottom view of the cover piece of the socket element of the unit;

Fig. 5 is a plan view of the base piece of the socket element;

Fig. 6 is a plan of the plug element connected to the socket element, only a fragment of the base piece of the latter being shown;

Fig. 7 is a diagram of the circuit;

Fig. 8 is a view showing the structural relation of the unit and battery.

My apparatus includes a unit 1, comprising two separable parts, a socket element 2, and a plug element 3. The socket element has a base piece 4 and a cover piece 5 connected by bolts 6 which, as far as the user is concerned, holds them permanently together. The bolts pass through bores 7 in the pieces and there are countersunk openings 8 for the heads 9 and nuts 10 of the bolts, so that they do not protrude. The cover piece has a circular seat 11 in which

a small magnetic needle 12 is free to turn on pivot 13, being visible from above. An indicating mark 14 is placed at a certain point in the circumference of this seat. A coil of wire 15 is carried on the base piece immediately below the magnet, thus forming a galvanometer or polarity indicator. The base piece 4 has a downward extension 16 in which are two symmetrically arranged keyhole openings 17 in which are seated contact springs 18 pressing resiliently into the larger ends of the openings. Wires 19 are led in through one end of the element and connected respectively to one of these springs at 20 and to one terminal 21 of the coil 15, the top and bottom pieces being suitably channeled at 22 to accommodate the wires. At the other end of the base piece are fixed two similar symmetrically arranged, U-shaped, resilient, metal contacts 23, one of which is connected to the remaining terminal 25 of the coil 15, while the other is connected at 26 to the remaining contact spring 18. The facing arms 24 of the contact springs 23 are normally in contact but are capable of being pushed apart. In the base and cover pieces 4 and 5 there are suitable chambers 27 for the springs and from these extend socket openings 28 to the end of the element, leaving between the socket openings abutments 29 through which pass certain of the bores 7.

The plug element 3 consists of identical base and cover members 30 connected by bolts 31. The element is symmetrical from top to bottom and from right to left and has two rigid contact plugs 32 so positioned as to pass on either side of abutments 29 when the plug and socket elements are joined. The plugs 32 are then thrust into the socket openings 28 and press the contact arms 24 apart. The contact plugs 32 are connected within the plug element to wires 33 extending from the other end of the element to a socket element 34 adapted to be fitted over the plug terminals 35 of a current rectifier 36 of familiar type and embodying electrodes 37 in an electrolyte in a suitable container.

For use with the apparatus described there is furnished an element 38 having a lamp socket 39, adapted for an ordinary electric lamp 40, a separable plug and socket connection 41-42 and an ordinary screw plug 48 adapted to be screwed into an ordi-

nary lamp socket 49 connected to a line from any source 50 of alternating or direct current. To the removable member 42 of the plug and socket connection are joined the ends of wires 19 which at their other ends are connected to socket element 2. The three connections of element 38 are wired in series. The separable connection 41—42 is of the usual symmetrical type so that the polarity of the connection may be reversed by turning the plug around. The details of the element 38 need not be more fully shown and described.

The above described apparatus is supplied with and for use particularly on a battery 43 having identical terminals 44 adapted to fit in the enlargements of the keyhole shaped socket openings 17 and to press the springs 18 to one side, thus insuring good contact. Adjacent the terminals 44 on the battery casing is an upward abutment or extension 45 extending considerably above the tops of the terminals. It is to be noted that the abutment or extension 16 in which the openings 17 are located is positioned at one side of the socket element 2 so that the element forms an overhanging ledge 46 on one side of extension 15 but there is a smooth side wall 47 on the other side. The spacing of abutment 45 from terminals 44 of the battery is such that the smooth surface 47 of the socket element is guided down the face of this abutment as the plug and socket connections are operatively connected, but that if an attempt is made to join the connections the other way around the overhanging ledge 46 will strike the top of abutment 45 and prevent the completion of the connection. It is, therefore, possible to position the socket member on the battery in only one operative relation.

It is furthermore to be noted that all of the separable connections are of different shape or size so that it is impossible for the user to connect any switch element to any other except its complementary element.

The method of using the apparatus will now be described. It is presumed that the user knows nothing about electricity, nor what kind of current is available in the supply line, and merely follows mechanically a set of printed instructions. The socket element 2 without plug element 3 is placed on the battery in the only position it will go. Element 38 is then screwed into the supply socket 49 and lamp 40 inserted in socket 39, the lamp serving as resistance to decrease the voltage across the battery terminals. The connection 41—42 is closed, completing a circuit from source 50, through coil 15, contacts 24, battery 43 and lamp 40.

The user now observes the needle 12 where three conditions are possible. The needle will point to the indicating mark 14 if the current is direct and flows in one direction

through coil 15; it will point away from the mark if the current is direct and flows in the reverse direction; it will be uninfluenced if the current is alternating.

The indicating mark is so placed that the needle will point to it if the polarity of the line is right for the battery as connected, and if this condition is found to exist the user merely leaves the apparatus connected for the designated time. If the needle points away from the mark the user disconnects the plug and socket 41—42 and reconnects them with the contacts reversed. The needle then points to the indicator. The connection 41—42 is thus used as a pole-changing switch.

If the third condition exists the rectifier connection is prepared as described and plug element 3 connected to socket element 2. The rectified current now flows through the coil, and, as above, the needle points to or from the mark 14. If it points away from the mark the plug is withdrawn and reinserted in the reverse position, being used as a pole-changing switch.

From the above description it is apparent that the user need know nothing whatever about electrical connections and circuits. The apparatus can be set up in only one way and an inexperienced user can, by following merely mechanical directions, use it successfully.

It is to be understood that other embodiments of my invention are possible and I contemplate as within the scope thereof all such modifications and equivalents as fall within the scope of the appended claims.

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

1. In combination, a storage battery, an element, a polarity indicator carried by said element, complementary electrical contacts carried by said battery and said element and having but one cooperative relation, and means for including said polarity indicator, battery and contacts in circuit with a source of direct current, said means including a pole-changing switch.

2. In combination, a battery, an element carrying a polarity indicator, a second element, and a rectifier, separable plug and socket connections between the battery and the first element, between the first and second elements, and between the rectifier and the second element, whereby they may be all connected in series, and means including a separable plug and socket connection whereby the above described circuit may be connected to a source of current, all of said separable connections being of different mechanical construction and incapable of being connected except in the specified relation.

3. In combination in a battery charging

apparatus, a plug element and a socket element, the socket element comprising a casing, a polarity indicator in said casing and visible in the top thereof, electrical contact members in the bottom of said casing whereby connection may be with a battery, normally contacting, symmetrically arranged, resilient springs in said casing and accessible through the side of the casing, and said plug element having connections for attachment to a rectifier and having symmetrical plug contacts adapted for insertion between said springs in two relations, and when so inserted separating them.

4. In combination in a battery-charging apparatus, a plug element and a socket element, the socket element comprising a casing, a polarity indicator in said casing, and visible in the top thereof, electrical contacts in the bottom of said case whereby connection may be made with a battery, normally contacting resilient springs in said casing and accessible through a socket in the casing, and conductors connecting in series said polarity indicator, said contacts and said springs and adapted to connect them to a source of current, and said plug element having connections for attachment to a rectifier and having plug contacts adapted for insertion in the socket and adapted to spread apart the springs, whereby a rectifier may be included in the above described circuit.

5. In combination in a battery charging apparatus, a battery, a rectifier, a plug element and a socket element, the socket ele-

ment comprising a casing, a polarity indicator in said casing and visible in the top thereof, electrical contact members in the bottom of said casing whereby connection may be made with a battery, normally contacting, symmetrically arranged, resilient springs in said casing and accessible through the side of the casing, and said plug element having connection for attachment to the rectifier and having symmetrical plug contacts adapted for insertion between said springs in two relations, and when so inserted separating them.

6. In combination in a battery charging apparatus, a battery, a rectifier, a plug element and a socket element, the socket element comprising a casing, a polarity indicator in said casing and visible in the top thereof, electrical contacts in the bottom of said case whereby connection may be made with the battery, normally contacting resilient springs in said casing and accessible through a socket in the casing, and conductors connecting in series said polarity indicator, said contacts and said springs and adapted to connect them in a source of current, and said plug element having connections for attachment to the rectifier and having plug contacts adapted for insertion in the socket and adapted to spread apart the springs whereby the rectifier may be included in the above described circuit.

Signed at Rochester, New York, this 1st day of November, 1923.

EDWIN C. FRITTS.