(No Model.)

L. F. JOHNSON.

CURRENT SEPARATOR.

No. 522,837. Patented July 10, 1894.

Fig. 1.

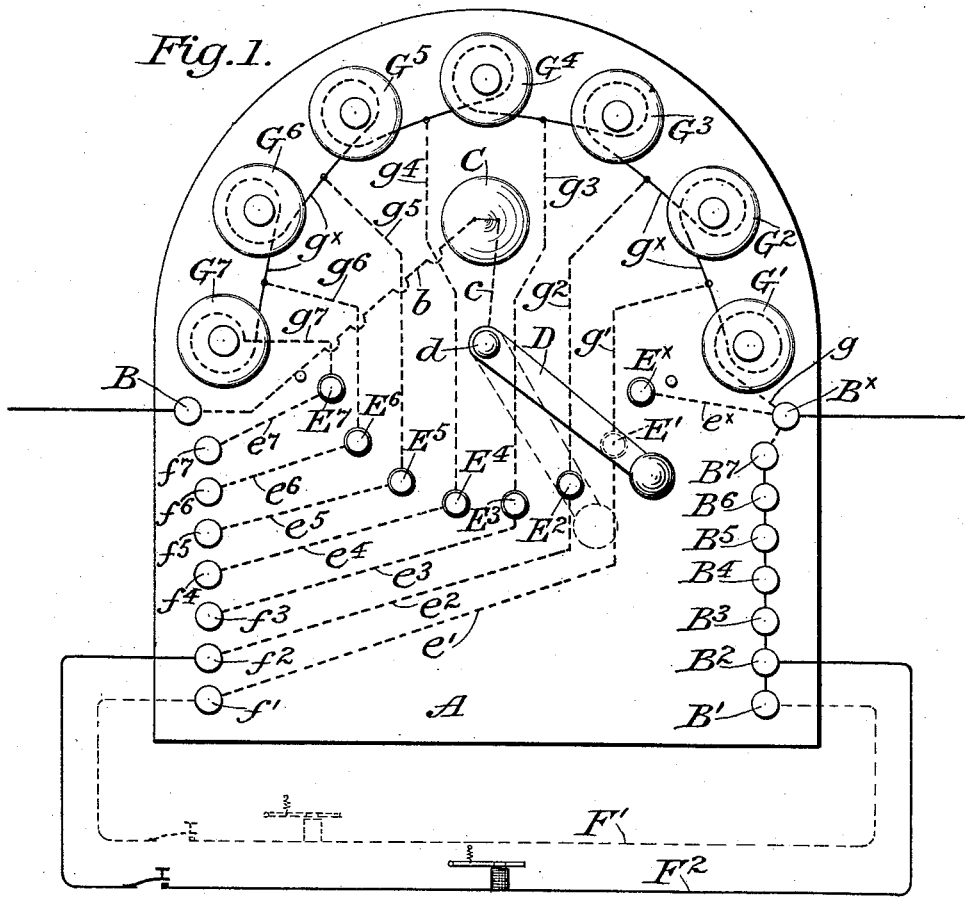


Fig. 2.

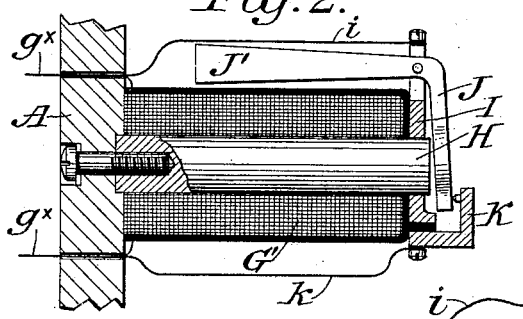


Fig. 3.

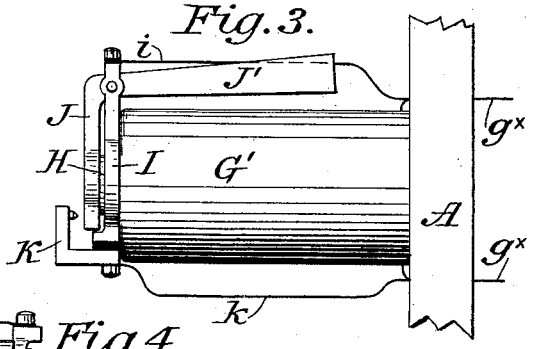
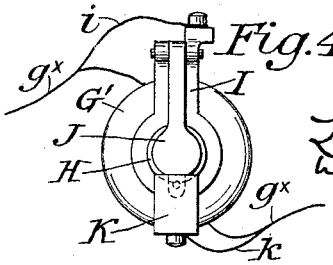


Fig. 4.



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CURRENT-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 522,837, dated July 10, 1894.

Application filed April 7, 1894. Serial No. 506,758. (No model.)

To all whom it may concern:

Be it known that I, LOUIS F. JOHNSON, of Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Current-Separators; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

It is not infrequently the case that along the line of an electric lighting circuit more or less current is required for various purposes, as for a telegraph instrument or other signaling devices, particularly in connection with railway signaling systems. These requirements are commonly supplied by local batteries although they require care and attention and notwithstanding the fact that an abundant current is supplied through the lighting circuit which would be amply sufficient to operate all of the local circuits which might be required.

It is the object of this invention to provide a simple, compact and inexpensive apparatus that can be placed in every signal tower or in any other place upon the line of a lighting circuit and by means of which current from the lighting circuit may be supplied at such times and in such proportions as may be required for the operation of the various local circuits.

The apparatus is specially designed for connection to the lighting circuit in series, and is so arranged as to throw more or less resistance into the shunt from the lighting circuit and to permit secondary shunts around such resistance to be used for such purposes as may be desired.

The construction and arrangement of the apparatus will be set forth hereinafter.

In the accompanying drawings: Figure 1 is a front elevation of an approved form of the apparatus, two local circuits being indicated diagrammatically and the wiring of the apparatus being indicated for the most part by dotted lines. Fig. 2 is a detail view in central section of one of the resistance coils and its appurtenances. Fig. 3 is a side view of the same with the armature in a different position; and Fig. 4 is an end view of the same.

The several elements of the apparatus are mounted upon a plate A, being insulated from each other except as they are connected in the manner hereinafter described. One branch from the dynamo or from the lighting circuit is connected to a binding post B and the other branch back to the dynamo or lighting circuit is connected to a corresponding binding post $B^{\times}$.

From the binding post B a wire *b* extends to a lamp or other equivalent resistance C which is always in circuit and serves to protect the more delicate instruments which may be connected to the apparatus from being burned out by the full strength of the current.

A wire *c* connects the resistance C to a switch D which is pivoted to the supporting plate A, as at *d*, and is adapted to move over a series of contact points $E^{\times}$, E′, E^2, E^3, &c. Each contact point $E^{\times}$, E′, E^2, &c., is connected by a wire $e^{\times}$, *e′*, e^2, &c., to a corresponding binding post $B^{\times}$, B′, B^2, &c., the binding post $B^{\times}$ being connected, as before stated, to the supply wire, while the other posts B′, B^2, &c., receive respectively one side of each of the several local circuits, one of which is indicated at F′ in dotted lines and another at F^2 in full lines, the binding posts B′, B^2, &c., being also connected in common to the post $B^{\times}$. The other side of each of the local circuits is connected to a corresponding binding post *f′*, f^2, f^3, &c.

Conveniently disposed upon the plate A are resistances G′, G^2, G^3, &c., which might be of equal strength but preferably are arranged with relation to the strength of circuit required by the several local circuits.

The binding post $B^{\times}$ is connected by a wire *g* to the resistance G′ and the successive contact points E′, E^2, E^3, &c., are connected by wires *g′*, g^2, g^3, &c., to points between the successive resistances, it being understood that all of the resistances are connected together. The last resistance G^7 is connected by a wire g^7 to the binding post E^7 which is the last of the series.

As above stated the several resistances are connected together and in order that the apparatus may not be disabled by the breaking of a wire in any one resistance I have provided means whereby the occurrence of such an accident shall complete the circuit around the particular resistance which may be disabled. The means referred to are shown clearly in Figs. 2, 3 and 4. The resistance is formed as a coil around a core H which is

firmly secured to the bed-plate A. Upon the end of the core H is fixed a plate I which is electrically connected by a wire i with the common wire $g^{\times}$ and which also has pivoted thereto in electrical contact therewith an armature J which is bent at a right angle substantially as represented in Figs. 2 and 3. A back contact K for said armature is also supported by the plate I but is insulated therefrom and is connected by a wire k to the common wire $g^{\times}$. The core H is horizontally disposed and the pivot of the bent armature J is above the core H whereby the weight of the arm J′ of said armature tends to maintain the armature in the position shown in Fig. 2 and thereby to close the path from the wire i and k through the back contact and the armature. So long as the wire of the resistance coil remains unbroken, however, the core H will be magnetized and will attract the vertical arm of the armature and will keep the path through the armature and back contact broken. Should the resistance wire break within the coil the armature will at once be released and the current will continue around the particular resistance.

The operation of the apparatus is as follows: If the switch be placed upon the contact point $E^{\times}$ the current will then flow from the binding post B to and through the lamp or resistance C and over the switch D and contact point $E^{\times}$ to the binding post $B^{\times}$, no current being then supplied to the locals. If the switch be placed upon the contact point E′ two paths will then be offered to the current from such contact point E′, one being through the resistance G′ to the post $B^{\times}$ and the other through the wire e', post f', local circuit F′, and post B′, back to the common point $B^{\times}$, it being assumed that the normally open key or switch in the local is closed. The resistance G′ is so proportioned, relative to the resistance of the local F′, that a sufficient portion of the whole current will be diverted through the local to operate the instrument included therein. Should the switch be placed on the contact point E^2, then both locals F′ and F^2 will be included, for two paths are offered from such contact point E^2, one through the wire g^2 and the resistances G^2 and G′ and the other through the wire e^2 and local F^2, while from the common point between the two resistances G^2 and G′ a path is offered through the wires g' and e' to the local F′. In a similar manner the several locals may be added one after another until all are included as shunts around the respective resistances. On the other hand all the locals will be cut out by placing the switch upon the contact point $E^{\times}$.

It is understood that in practice the several local circuits are normally open and are closed only as they are used.

I claim as my invention—

1. An apparatus for dividing a main current according to the requirements of local circuits the same comprising connections for the main circuit, a common connection for one side of the local circuits to one side of the main circuit, independent connections for the other side of the local circuits, and means for interposing resistance between the connections for the main circuit and at the same time connecting in one or more of said local circuits, whereby the local circuit receives the shunt from said resistance, substantially as shown and described.

2. An apparatus for dividing a main current according to the requirements of local circuits, the same comprising connections for the main circuit, a common connection for one side of the main circuit, independent connections for the other side of the local circuits, a series of resistances and means for cutting in one or more of said resistances into the main circuit, and at the same time cutting in one or more of the corresponding local circuits, whereby the local circuits receive the shunts from said resistances, substantially as shown and described.

3. An apparatus for dividing a main current according to the requirements of local circuits, the same comprising connections for the main circuit, a common connection for one side of the local circuits to one side of the main circuit, independent connections for the other side of the local circuits, a series of resistances connected at one end to one side of the main circuit, a switch connected to the other side of the main circuit, and a series of contact points for said switch connected respectively into said series of resistances between successive resistances and to the independent connections for the local circuits, substantially as shown and described.

4. An apparatus for dividing a main circuit, according to the requirements of local circuits, the same comprising connections for the main circuit, a common connection for one side of the local circuits to one side of the main circuits, a series of resistances connected at one end to one side of the main circuit, and a series of contact points for said switch connected respectively into said series of resistances between successive resistances and to the independent connections for the local circuits, and a cut-out for each resistance controlled by such resistance, whereby the continuity of the circuit is uninterrupted when the wire in a resistance is ruptured, substantially as shown and described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS F. JOHNSON.

Witnesses:
A. N. JESBERA,
A. WIDDER.