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SIGNAL LIGHTING APPARATUS

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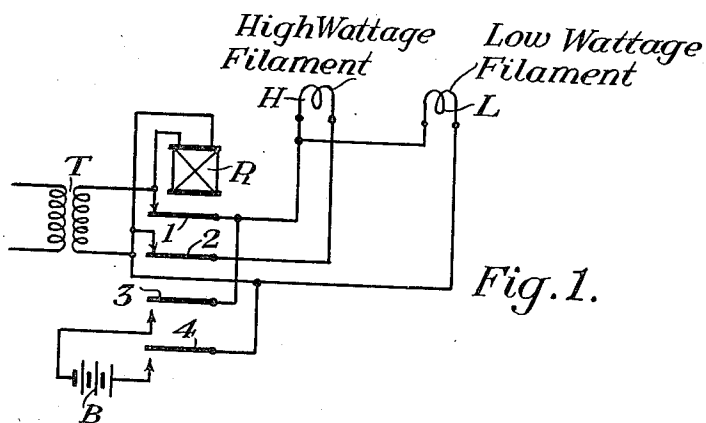


Fig. 1.

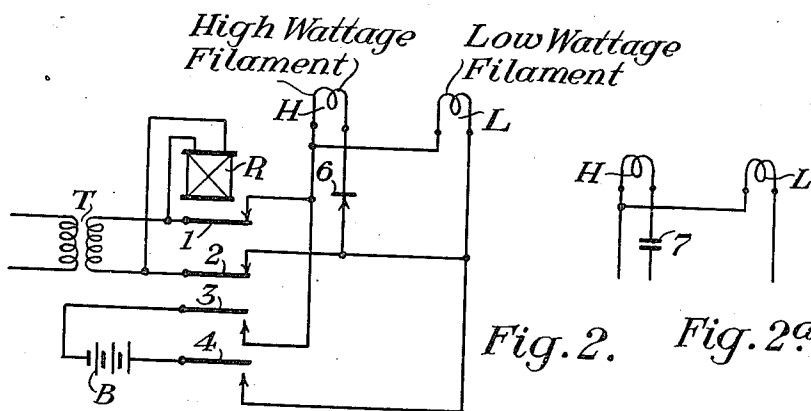


Fig. 2. Fig. 2a

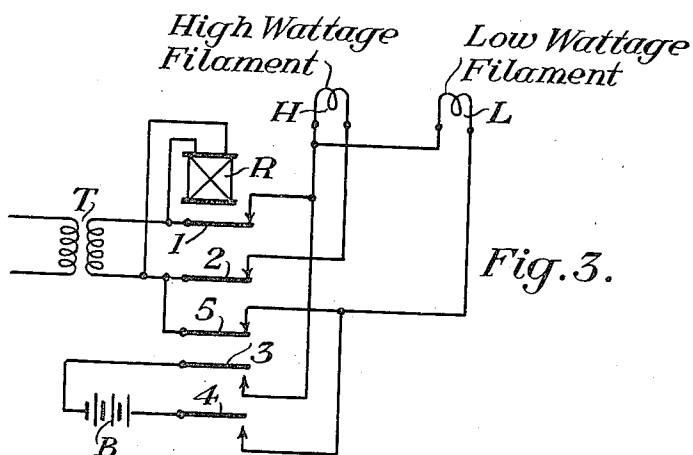


Fig. 3.

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SIGNAL LIGHTING APPARATUS

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6 Claims. (Cl. 177-329)

Our invention relates to signal lighting apparatus of the type involving a main source of current, such as an alternating current transmission line, for normally supplying lighting current to the signal, an auxiliary source of current, such as a local battery, for supplying lighting current to the signal in the event of failure of the main source, and a power transfer relay for connecting the signal with the main source or the auxiliary source according as the main source is effective or is not effective to supply lighting current to the signal.

One feature of our invention is the provision of means for minimizing the amount of power drawn from the auxiliary source of current when this source is in use for the supply of current to the signal.

We will describe several forms of apparatus embodying our invention, and will then point out the novel features thereof in claims.

In the accompanying drawing, Fig. 1 is a diagrammatic view showing one form of apparatus embodying our invention. Figs. 2 and 3 are diagrammatic views showing modifications of the apparatus shown in Fig. 1 and also embodying our invention. Fig. 2^a is a diagrammatic view showing a modification of a portion of the apparatus shown in Fig. 2 and also embodying our invention.

Similar reference characters refer to similar parts in each of the several views.

Referring first to Fig. 1, the reference characters H and L designate a high wattage filament and a low wattage filament, respectively, which filaments may be the two filaments of a double filament lamp, or the filaments of two single filament lamps. A transformer T has its primary constantly connected with an alternating current transmission line, and the secondary of this transformer is constantly connected with the operating winding of a power transfer relay R. A battery B is provided as an auxiliary source of current in the event that the supply of power to the transformer T should fail.

The left-hand terminal of each filament H and L is connected with the upper terminal of the transformer secondary through a front contact 1 of relay R. The right-hand terminal of filament H is connected with the lower terminal of the transformer secondary through a front contact 2 of relay R. The right-hand terminal of filament L is connected directly to the lower terminal of the transformer secondary. The left-hand terminals of the two filaments H and L are also connected with the left-hand terminal

of battery B through a back contact 3 of relay R, while the right-hand terminal of filament L is connected to the right-hand terminal of battery B through another back contact 4 of relay R.

As long as transformer T is supplied with power, relay R will be energized so that both filaments H and L will be supplied with lighting current from the secondary of the transformer. Battery B will then be disconnected from both filaments. If the supply of power to transformer T should fail, however, relay R will become de-energized, thereby causing battery B to supply current to only the low wattage filament L. It follows that less current will be drawn from the battery, and longer battery life will be attained, than if both filaments H and L were fed with current from battery B when the main source fails.

With the apparatus shown in Fig. 1, and with relay R de-energized, the right-hand terminal of battery B is connected with the lower terminal of the transformer secondary through back contact 4. In systems of the type to which our invention is particularly well adapted, that is, in railway signaling systems, it is sometimes considered desirable to keep the two sources of power supply entirely isolated under all conditions. When this is so the apparatus shown in Fig. 2 may be used. Referring to this view, it will be seen that the two filaments H and L are normally connected in multiple across the two terminals of the secondary of transformer T through contacts 1 and 2, respectively, so that normally both filaments are supplied with current from this source. A rectifier 6 is interposed between contact 2 and the right-hand terminal of filament H, and this rectifier permits only one half of each wave of alternating current from transformer T to reach the high wattage filament H. When relay R is de-energized, filaments H and L become connected in multiple across the terminals of battery B through back contacts 3 and 4, but rectifier 6 is so poled that current from battery B cannot flow through the high wattage filament H. It follows that with the apparatus shown in Fig. 2, the two sources of power supply are entirely isolated under all conditions, but the power drawn from battery B is minimized because when this battery is called into use it supplies current to the low wattage filament L only.

Fig. 2^a is the same as Fig. 2 except that a condenser 7 is substituted for the rectifier 6. This condenser permits the alternating current from transformer T to reach filament H, but prevents

direct current from battery B from flowing in that filament.

Referring now to Fig. 3, the apparatus shown in this view is similar to that shown in Fig. 1, except that an additional front contact 5 of relay R is interposed between the right-hand terminal of filament L and the lower terminal of the secondary of transformer T. It follows that battery B and transformer T are at all times isolated, but that when battery B is called into use, it will supply current to only the low wattage filament L.

Although we have herein shown and described only three forms of signal lighting apparatus embodying our invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of our invention.

Having thus described our invention, what we claim is:

1. Electric signal lighting apparatus comprising a main high wattage filament, an auxiliary low wattage filament, a main source of current, an auxiliary source of current, a transfer relay having its operating winding constantly connected with said main source of current, and means including contacts of said relay for connecting said main source in circuit with both of said filaments or said auxiliary source in circuit with only said auxiliary filament according as said transfer relay is energized or de-energized.

2. Electric signal lighting apparatus comprising a main high wattage filament, an auxiliary low wattage filament, a main source of current, an auxiliary source of current, a transfer relay having its operating winding constantly connected with said main source of current, means including contacts of said relay for connecting said filaments in multiple across said main source or said auxiliary source according as said relay is energized or deenergized, and a rectifier interposed between said auxiliary source and said main filament and poled to prevent the supply of current from the auxiliary source to the main filament when said relay is deenergized.

3. Electric signal lighting apparatus comprising a main high wattage filament, an auxiliary low wattage filament, a main source of current, an auxiliary source of current, a transfer relay having its operating winding constantly connected with said main source of current, and means including contacts of said relay for supplying current from said main source to both of said filaments or from said auxiliary source to only said auxiliary filament according as said relay is energized or deenergized.

4. Electric signal lighting apparatus comprising a main high wattage filament, an auxiliary

low wattage filament, a main source of current, an auxiliary source of current, a transfer relay having its operating winding constantly connected with said main source of current, a connection from one terminal of each filament to one terminal of said main source through a front contact of said relay and to one terminal of said auxiliary source through a back contact of said relay, a connection from the other terminal of said main filament to the other terminal of said main source through another front contact of said relay, a connection from the other terminal of the auxiliary filament to said other terminal of said main source through a third front contact of said relay, and a connection from said other terminal of said auxiliary filament to the remaining terminal of the auxiliary source through another back contact of said relay.

5. Electric signal lighting apparatus comprising a main high wattage filament, an auxiliary low wattage filament, a main source of current, an auxiliary source of current, a transfer relay having its operating winding constantly connected with said main source of current, means including a front contact of said relay for connecting one terminal of each filament with one terminal of said main source, means including another front contact of said relay for connecting the other terminal of said main filament with the other terminal of the main source, means for connecting the other terminal of said auxiliary filament with said other terminal of the main source, and means including back contacts of said relay for connecting the two terminals of said auxiliary filament with the terminals of said auxiliary source.

6. Electric signal lighting apparatus comprising a main high wattage filament, an auxiliary low wattage filament, a main source of current, an auxiliary source of current, a transfer relay having its operating winding constantly connected with said main source of current, a connection from one terminal of each filament to one terminal of said main source through a front contact of said relay and to one terminal of said auxiliary source through a back contact of said relay, a connection from the other terminal of said main filament to the other terminal of said main source through another front contact of said relay, a connection from the other terminal of the auxiliary filament to said other terminal of said main source, and a connection from said other terminal of said auxiliary filament to the remaining terminal of the auxiliary source through another back contact of said relay.

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