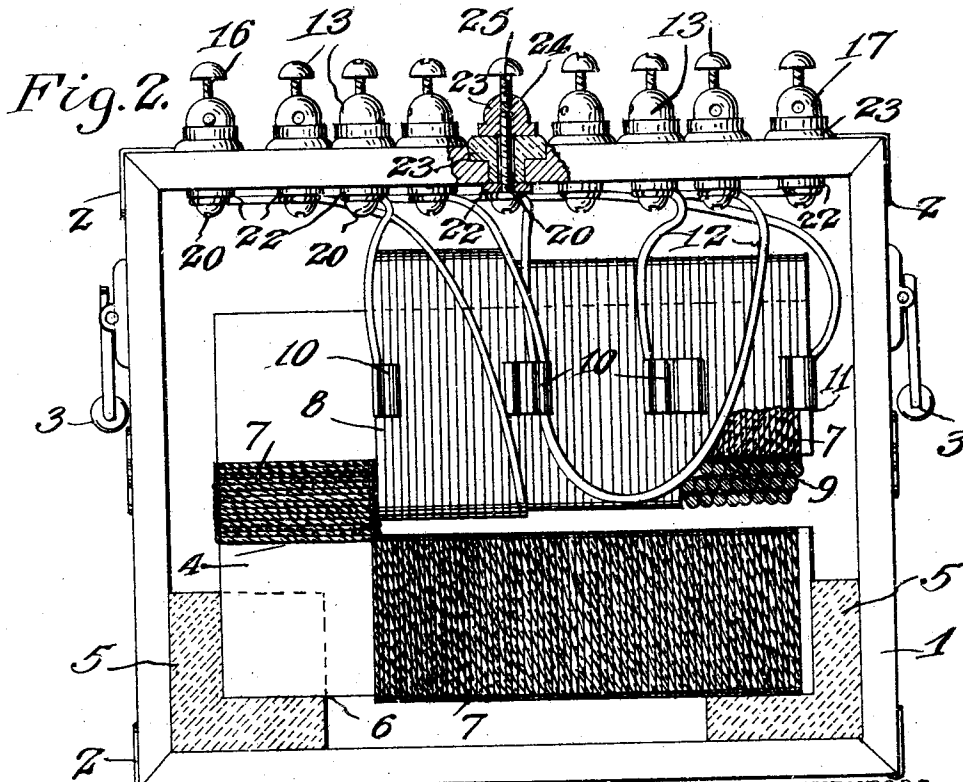
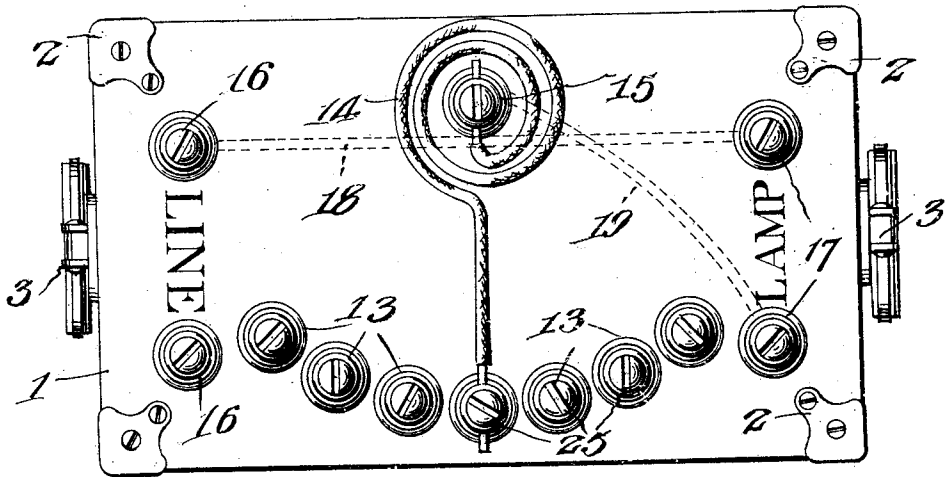


B. L. HADFIELD & H. A. HALL.
CURRENT REDUCER.
APPLICATION FILED MAY 25, 1909.

958,111.

Patented May 17, 1910.
2 SHEETS—SHEET 1.

Fig. 1



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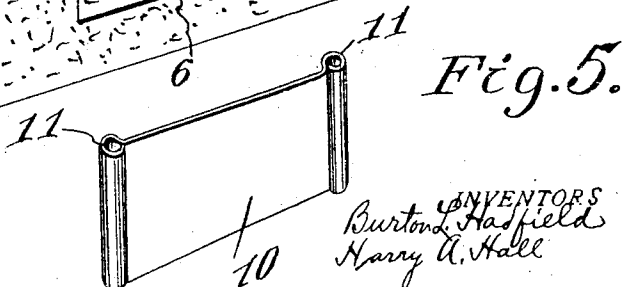
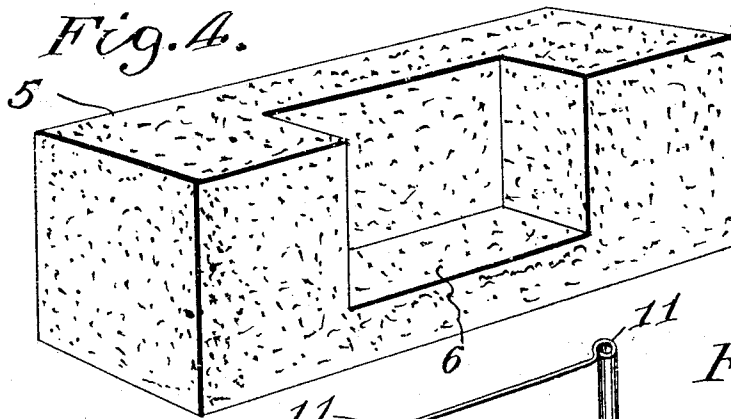
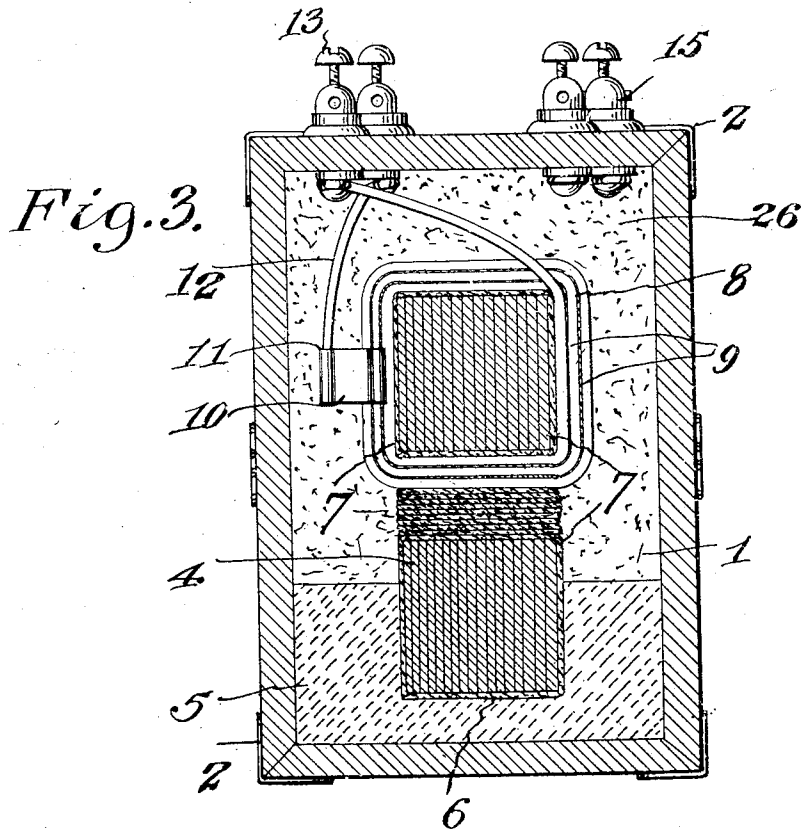
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2 SHEETS—SHEET 2.



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BURTON L. HADFIELD AND HARRY A. HALL, OF WAUSAU, WISCONSIN.

CURRENT-REDUCER.

958,111.

Specification of Letters Patent. Patented May 17, 1910.

Application filed May 25, 1909. Serial No. 498,309.

To all whom it may concern:

Be it known that we, BURTON L. HADFIELD and HARRY A. HALL, citizens of the United States, residing at Wausau, in the county of Marathon and State of Wisconsin, have invented certain new and useful Improvements in Current-Reducers, of which the following is a specification, reference being had to the accompanying drawings.

This invention is a current reducer for changing the voltage and amperage of an alternating electric current such as usually supplied by city lighting plants to theaters and used in flood lights, spot lights, stereopticons, moving picture machines, etc.

The object of the invention is to provide a simple and practical device of this character which will be compact in construction, durable in use and convenient to handle and the use of which in connection with a moving picture machine will not only materially reduce the amount of current consumed but also produce a much better light.

With the above and other objects in view, the invention consists of the novel features of construction and the combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the improved current reducer; Fig. 2 is a front elevation of the device with the front wall removed and with parts in section; Fig. 3 is a vertical cross sectional view; Fig. 4 is a perspective view of one of the core supports; and Fig. 5 is a perspective view of one of the connecting plates or strips.

In the preferred embodiment of the invention illustrated in the accompanying drawings 1 denotes a casing which may be of any suitable form and construction but which is preferably a rectangular wooden box reinforced with metal plates and corner pieces 2. Suitable handles 3 are provided at the ends of the box to permit it to be conveniently carried.

Within the box or casing is a core 4 of U-shape and preferably supported by two corner blocks 5 molded from cement or similar plastic material. These corner supports 5 are of rectangular shape to fit in the lower corners of the box and they are formed with recesses or seats 6 for the reception of the core.

The core is composed of a plurality of U-shaped pieces of sheet iron or other suitable metal which are united by a binding 7 consisting, preferably, of cord wrapped around the two arms of the core and also its central connecting portion, as clearly shown in Fig. 2 of the drawings. The lower arm of the core rests in the supports 5 and upon its upper arm is provided a wire coil 8 made, preferably, of copper wire. The layers of this coil 8 are insulated from each other by layers of high tension shellac insulating tape 9 and at different points throughout the length of the coil are provided metal connectors 10 which are insulated from the other portions of the coil through which they project. Each of these connectors 10 is in the form of a plate or strip of copper having its ends bent to form eyes 11, the inner one of which receives the wire of the coil 8 and is soldered thereto and the outer one of which receives and is soldered to the end of an insulated conducting wire 12.

The several wires 12 are connected to a longitudinal series of terminals or binding posts 13 arranged in the top of the wall of the box or casing 1 and to any one of which latter may be attached a connecting wire or conductor 14 leading from a binding post or terminal 15 also arranged in the top of the box and opposite the terminals 13. A pair of similar binding posts or terminals 16 are arranged in the top of the box adjacent to one end and marked "Line," while a similar pair designated by the numerals 17 is arranged in the top of the box adjacent to its other end and marked "Lamp." One of the terminals 16 is connected to one of the terminals 17 by a conductor 18 and the other terminal 17 is connected to the terminal 15 by a conductor 19, the other terminal 16 being connected to the inner end of the coil 8. It will be understood that any number of the terminals 16 may be provided, and that one is used for the outer end of the coil and the others for the intermediate portions of said coil.

Each of the terminals or binding posts 13, 14, 16, 17 preferably comprises a metal bolt 20 passed through a shouldered insulating tube 21 of porcelain or the like set in the top of the box. A washer 22 of fiber or other insulating material is arranged on the bolt between the inner or under face of the top

of the box and the head of the bolt while upon the screw threaded outer end of said bolt is a nut 23 containing a transverse opening 24 to receive a conducting wire and a clamping screw 25 which intersects the opening 24 and is adapted to retain the conducting wire therein.

The space within the box or casing and around the core and other parts above described are preferably filled with a granular non-conducting material, as indicated at 26.

In using the invention, the supply conductor leading from the mains of a city lighting plant are connected to the terminal 16 and the conductors leading to the lamp or machine to which the reduced current is to be supplied, are connected to the terminals 17. The conductor 14, which latter is preferably covered with insulating material and has a portion coiled to permit it to be easily adjusted, is then attached to any one of the terminals 13 according to the amount of reduction of the current that is desired.

It has been found in practice that a current reducer constructed as above described will produce an intensely white light and at the same time effect a material saving in the consumption of current. By the use of the sheet copper connectors, it is possible to cut in on the copper wire coil at any desirable point without disturbing the symmetry of the coil or the electrical energy exerted on the laminated iron core when a current is flowing through the wires. By keeping an even symmetrical coil the magnetic lines of force are made to act smoothly and evenly and to be properly distributed, hence the efficiency of the device.

While the preferred embodiment of the invention has been shown and described in detail, it will be understood that various changes in the form, proportion and arrangement of parts and in the details of construction may be resorted to within the spirit and scope of the invention.

Having thus described the invention what is claimed is:

The herein described current reducer comprising a rectangular casing of non-conducting material, rectangular corner blocks arranged in the two lower corners of the casing and formed in their upper and inner faces with recesses, a U-shaped core composed of a plurality of U-shaped metal plates united by a binding of non-conducting cord wound around them, said core being disposed horizontally in the casing and having its lower arm seated in the recesses in said corner blocks, a wire coil permanently secured upon the upper arm of the core and having a plurality of layers separated by non-conducting material, sheet metal connectors projecting from different portions of said wire coil, said connectors having their inner ends bent to form eyes for the reception of the wire of the coil, and their outer ends formed with similar eyes, an arcuate series of binding posts in the top of the casing, conducting wires between the lower ends of said binding posts and the eyes at the outer extremities of said sheet metal connectors, other binding posts in the top of the casing, a conducting wire covered with insulating material and having one end connected to one of said last mentioned binding posts, the other end of the last mentioned wire being adapted to be connected to any one of the binding posts in the arcuate series, whereby different portions of the wire coil may be brought into circuit, and a granular non-conducting material in the casing around the parts therein.

In testimony whereof we hereunto affix our signatures in the presence of two witnesses.

BURTON L. HADFIELD.
HARRY A. HALL.

Witnesses:

LACA JESSUREAU,
BRAYTON E. SMITH.