E. WESTON.

SHUNT OR ELECTRICAL RESISTANCE.

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906,498.

Patented Dec. 8, 1908.

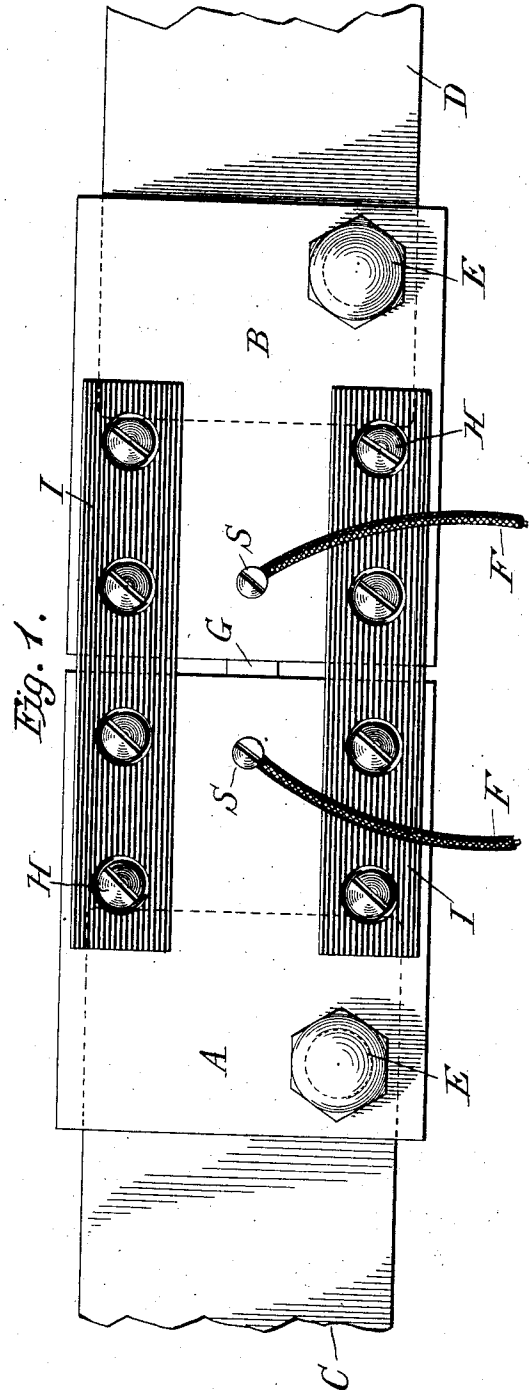

Fig. 1.

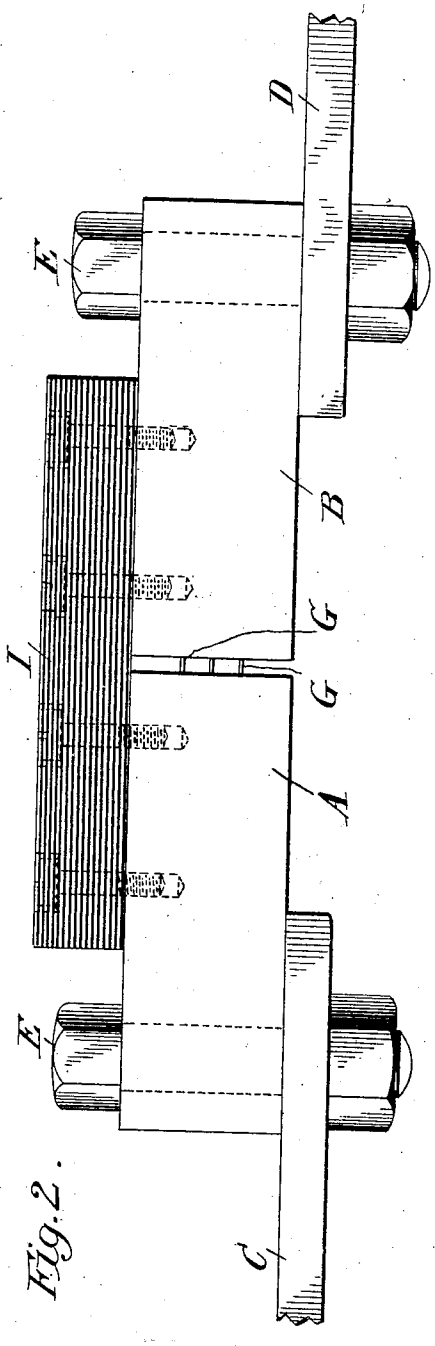

Fig. 2.

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UNITED STATES PATENT OFFICE.

EDWARD WESTON, OF NEWARK, NEW JERSEY.

SHUNT OR ELECTRICAL RESISTANCE.

No. 906,498. Specification of Letters Patent. Patented Dec. 8, 1908.

Application filed March 15, 1907. Serial No. 362,463.

To all whom it may concern:

Be it known that I, EDWARD WESTON, a subject of the King of Great Britain, and resident of Newark, county of Essex, and State of New Jersey, have made a new and useful Invention in Shunts or Electrical Resistances, of which the following is a specification.

My invention is directed particularly to an improvement upon an invention disclosed by me in a patent granted by the United States Patent Office on the 16th day of May, 1893, and bearing Number 497,482. In this patent I have disclosed a resistance designed for use in connection with systems of electrical energy, such as electric light and power stations in which there are utilized two metallic blocks or terminals of relatively high specific conductivity and heat absorbing capacity, and a series of interconnected short conductors or plates of relatively high specific resistance, said conductors or plates joining the two blocks or terminals together at their ends and being so located relatively that there is a free circulation of air between the plates themselves and around the ends thereof, for the purpose of giving a cooling effect due to air circulation.

The present improvement consists in locating the ends of the relatively large conducting blocks or terminals in very close proximity to each other and in securing directly thereto at their opposite ends one or more short conductors or plates of relatively high specific resistance, and in such manner that the conducting blocks or terminals, by reason of their good thermal conductivity and large heat dissipating capacity, will conduct away and dissipate practically all of the heat which may be developed by the current in the free or exposed portions or lengths of said short conductors or plates between them, the present improvement relying upon the conducting or heat absorbing effect of said blocks or terminals for the dissipation of heat.

My invention will be fully understood by referring to the accompanying drawings, in which,

Figure 1 is a plan view thereof; and Fig. 2 a side elevational view as seen looking at Fig. 1 in either direction.

Referring now to the drawings in detail, A and B represent the blocks or terminals, the same being preferably composed of good conducting material, such as copper.

E, E are bolts for securing the terminals to the bus bars or current mains D, D.

G, G, G represent short metal conductors or plates of relatively high specific resistance or poor electric conductivity as compared with that of the blocks or terminals A, B and made of any of the well known high resistance alloys. These plates are secured directly in the ends of the blocks or terminals A, B in any preferred manner, as for instance by slotting said ends and uniting them together by solder or in any other desired way.

I, I represent two insulating bars or supports for securing the two blocks or terminals A and B in rigid relation to each other and with their adjoining faces relatively close together, this being effected by bolts H, H, H, as shown.

S, S are binding screws or posts, one in each of the blocks or terminals A, B, for securing conductors F, F adapted to be connected to a current measuring instrument, for the purpose stated and in the manner disclosed in my before-mentioned patent.

Although I have shown a series of short conductors in the form of plates G, G, G connected directly to the adjoining faces of the blocks or terminals A, B, I do not limit myself to any number of such plates, as obviously a single plate, bar, rod, or other conductor of this nature and of any width or cross section might be used, or any number thereof, or any type of conductor of relatively high resistance as compared with that of the blocks or terminals A, B; or, they may be disposed in relation thereto in any preferred manner, so long as the relations of conductivity, both as to electrical currents and heat, is of such a nature that the conducting blocks or terminals A and B will always convey away or dissipate practically all of the heat generated in the free or exposed portions of the conductors or plates G, G, G, as fast as it is generated by the current passing through said resistances.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is—

1. An electrical resistance embracing two conducting blocks or terminals of relatively good conductivity and heat absorbing capacity, and one or more resistance conductors of relatively poor conducting capacity, so disposed in relation to said blocks or terminals that practically all of the heat gener-

ated in the relatively poor current conveying conductor or conductors will be absorbed by the blocks or terminals.

2. An electrical resistance embracing means adapted to convey relatively large volumes of current without heating, and possessing relatively large heat absorbing capacity; in combination with interconnected means of relatively poor current conveying capacity as compared with the first-named means, said parts being so disposed relatively that practically all of the heat developed in the interconnected means by the current flow will be absorbed by the first-named means.

3. An electrical shunt embracing two terminals of large current conveying and heat absorbing capacity and an intermediate resistance of relatively poor current conveying capacity so located with relation to the terminals that practically all the heat developed in the resistance will be absorbed by the terminals.

4. A shunt for use in a system of electrical distribution, embracing two terminals of relatively large current conveying and heat absorbing capacity, and an intermediate resistance of relatively poor current conveying capacity; in combination with means for connecting the terminals to an electrical measuring instrument; the two terminals and the resistance being relatively so proportioned and located with relation to each other that practically all of the heat developed in the resistance will be absorbed by the terminals.

5. A resistance device for use in systems for the distribution of electrical energy, embracing two terminals of relatively large current conveying and heat absorbing capacity and an intermediate conductor of relatively poor current conveying capacity, said conductor and terminals being so proportioned as to relative current conveying capacity that the terminals will absorb practically all of the heat developed in the intermediate conductor.

6. A resistance device for use with systems for the distribution of electrical energy, embracing two terminals of relatively good current conveying and heat absorbing capacity, and an intermediate conductor of relatively poor current conveying capacity; in combination with shunt connections for an electrical measuring instrument, said conductor and terminals being so proportioned that the terminals will absorb or dissipate practically all heat developed in the intermediate conductor.

7. An electrical resistance device, consisting of two blocks of metal of high specific conductivity, and a conductor of high specific resistance and short length connecting said blocks of metal, the free length of said conductor being such that the heat generated therein by the passage of a current therethrough, is conducted to and absorbed by said blocks of metal as rapidly as such heat is generated, whereby said conductor will not be overheated.

8. An electrical resistance device, consisting of a short conductor of high specific resistance, connecting two masses or blocks of metal of high specific conductivity, the free length of said conductor being such that the heat generated by the passage of an electric current therethrough will be absorbed by said blocks of metal as rapidly as generated, whereby said conductor will not become overheated.

9. An electrical resistance device, comprising two blocks or masses of metal of high specific conductivity separated by a short space, a conductor of high specific resistance connected to said blocks and spanning said space, the length of said conductor being such that the heat generated by the passage of a current therethrough, is conducted to and absorbed by said blocks or masses of metal as rapidly as generated, whereby said conductor will not become overheated.

10. A resistance device for an electric circuit, comprising two blocks or masses of metal of high specific conductivity, and a conductor of high specific resistance connecting said blocks or masses of metal, said conductor being of such small cross section as to produce the desired resistance within such a short length thereof, that the heat generated by the passage of an electric current therethrough will be conducted to and absorbed by the said blocks or masses of metal as rapidly as generated, whereby said conductor will not become overheated.

11. An electrical resistance device, consisting of two blocks of metal of high specific conductivity, and a conductor of high specific resistance and short length connecting said blocks of metal, the free length of said conductor being such that the heat generated therein by the passage of a current therethrough, is conducted to and absorbed by said blocks of metal as rapidly as generated, whereby said conductor will not be overheated, and means for connecting up said resistance device in an electric circuit.

12. An electrical resistance device, consisting of two blocks of metal of high specific conductivity, and a conductor of high specific resistance and short length connecting said blocks of metal, the free length of said conductor being such that the heat generated therein by the passage of a current therethrough, is conducted to and absorbed by said blocks of metal as rapidly as generated, whereby said conductor will not be overheated, and a shunt circuit leading around said conductor.

13. An electrical resistance device, consisting of a short conductor of high spe-

cific resistance, connecting two masses or blocks of metal of high specific conductivity, the free length of said conductor being such that the heat generated by the passage of an electric current therethrough will be absorbed by said blocks of metal as rapidly as generated, whereby said conductor will not be overheated, a shunt circuit leading around said conductor and means for connecting up said resistance device in an electric circuit.

14. An electrical resistance device, comprising two blocks or masses of metal of high specific conductivity located in close proximity to each other and a conductor of high specific resistance and short length having its ends embedded into said blocks of metal respectively, thereby leaving a short free length of conductor between said blocks of metal.

15. An electrical resistance device, comprising two massive terminals, composed of blocks of metal of high specific conductivity located in close proximity, and a conductor of high specific resistance having its ends embedded into said blocks of metal respectively, to leave a short free length of metal between said terminals.

16. An electrical resistance device, consisting of two blocks of metal of high specific conductivity and a high resistance conductor connecting said blocks of metal, said conductor being of such short free length that the heat generated therein by the passage of a current therethrough is absorbed and dissipated by said blocks of metal as rapidly as generated.

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

EDWARD WESTON.

Witnesses:

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