

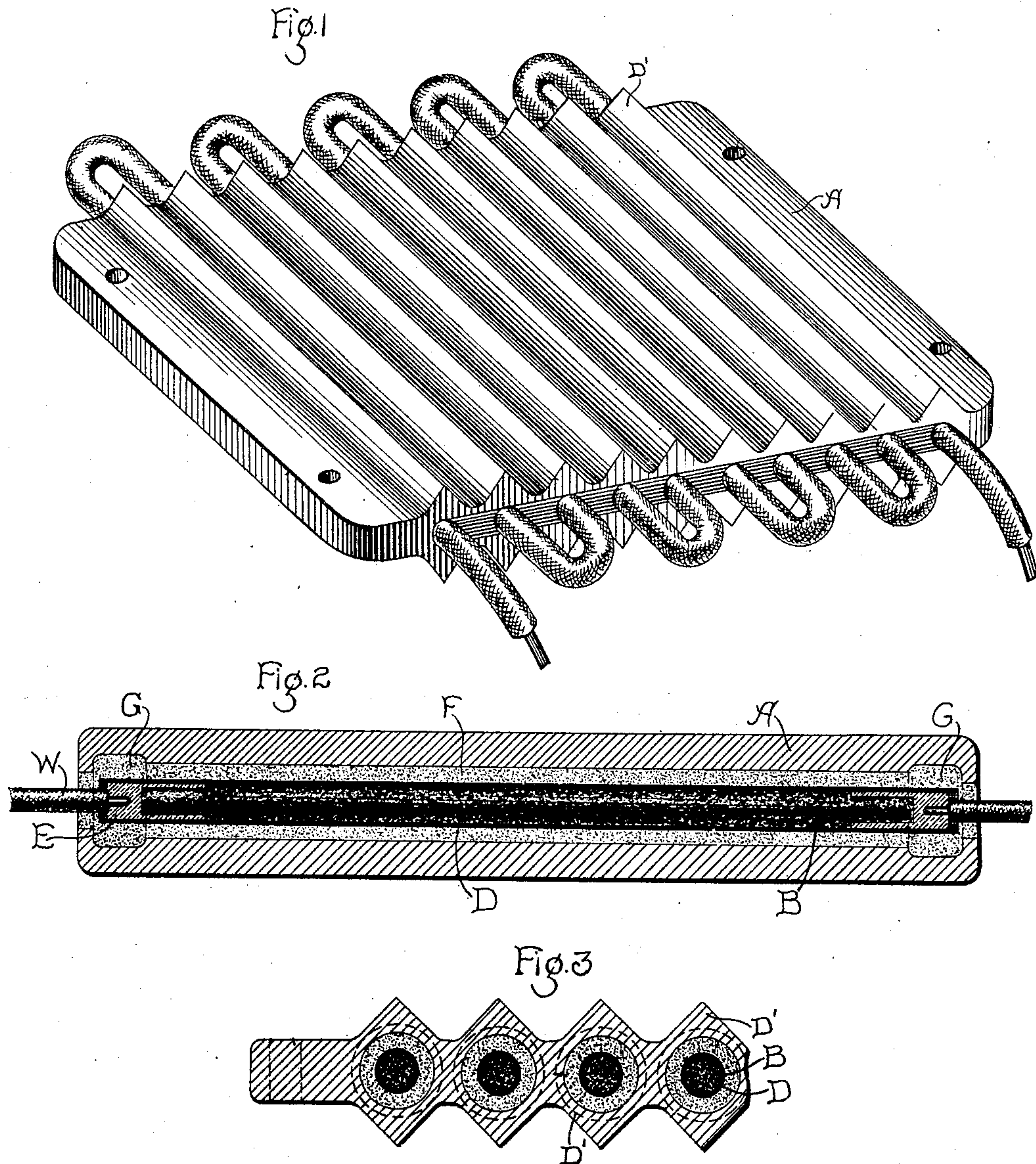
No. 678,887.

Patented July 23, 1901.

C. W. LARSON.
RESISTANCE DEVICE.

(Application filed Jan. 18, 1900.)

(No Model.)



Witnesses.
Fred L. Waring
Benjamin B. Hill.

Inventor
Carl W. Larson
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Att'y.

UNITED STATES PATENT OFFICE.

CARL W. LARSON, OF SCHENECTADY, NEW YORK, ASSIGNOR TO THE
GENERAL ELECTRIC COMPANY, OF NEW YORK.

RESISTANCE DEVICE.

SPECIFICATION forming part of Letters Patent No. 678,887, dated July 23, 1901.

Application filed January 18, 1900. Serial No. 1,847. (No model.)

To all whom it may concern:

Be it known that I, CARL W. LARSON, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Resistance Devices, (Case No. 903,) of which the following is a specification.

This invention relates to an electric resistance device adapted to have an extraordinary large current capacity in proportion to its size.

Figure 1 is a perspective view, Fig. 2 a longitudinal section, and Fig. 3 a transverse section, of one form of a device embodying the features of the invention, of which other forms may be constructed without exceeding the limits of the invention.

A is a support formed in a single piece of iron or other suitable material, preferably having a large capacity for heat. The support is formed with suitable projections or corrugations D' to increase the heat-radiating surface.

B indicates resistance-conductors, such as rods of amorphous carbon, which are located in perforations in the support or casing A and are provided with a thin sheath of incombustible insulation D, such as mica. This sheath is preferably about one thirty-second of an inch in thickness. The ends of the rods are incased in caps E, of conducting material, such as copper, of any suitable construction, to which the line and interconnecting wires W are attached. The caps E are also covered with the sheath of mica. Other means for connecting the wires W to the resistance-conductors may be employed, such as spreading out the cable and binding the ends about the conductor with a wire. In any case it is desirable to inclose the connecting means within an insulating-sheath.

The rods B are held in the support A by means of a suitable plastic heat-conducting and electric insulating material F, such as a mixture of Portland cement and sand or Portland cement alone, which is placed in the enlargements G of the perforations in the support and when it sets holds the carbon rods securely in place and excludes air, thus preventing deterioration of the carbon rods.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. An electric resistance, which comprises carbon rods provided with a thin sheath of incombustible heat-conducting and electric insulating material substantially as described, said rods being retained within a body of metal by a suitable plastic heat-conducting and electric insulating material.

2. An electric resistance, which comprises carbon rods provided with a thin sheath of mica, said rods being retained in a body of metal by a suitable plastic heat-conducting and electric insulating material.

3. An electric resistance, which comprises carbon rods provided at their ends with means for connecting them with the outside leads, a thin sheath of incombustible heat-conducting and electric insulating material surrounding said rods and connecting means, said parts being retained within a body of metal by a suitable plastic heat-conducting and electric insulating material.

4. An electric resistance, which comprises a metallic body provided with a plurality of perforations, a carbon rod in each perforation, copper caps on the ends of the rods, connecting-wires secured to the ends of said caps, a thin sheath of incombustible heat-conducting and electric insulating material which surrounds the rods and caps, and a plastic heat-conducting and electric insulating material which surrounds the sheath and retains the rods in the perforation of the casing.

5. An electric resistance comprising a metallic body provided with cavities, resistance-conductors in said cavities, and plastic material adapted to secure said conductors within said cavities by mechanically interlocking with said body.

6. An electric resistance comprising a metallic body having a large radiating-surface, said body being also provided with cavities, each of which has more than one diameter, carbon rods in said cavities, and a heat-conducting electric insulating cement filling the space between said conductors and said body.

7. An electric resistance, which comprises carbon rods provided with a thin sheath of incombustible heat-conducting and electric in-

5 sulating material substantially as described,
copper caps on the ends of the rods, connect-
ing-wires secured to the ends of said caps,
said rods being retained within a body of
metal by a suitable plastic heat-conducting
and electric insulating material.

8. An electric resistance, comprising a me-
tallic body provided with a plurality of per-
forations, a carbon rod in each perforation
10 and having reduced ends, copper caps hav-
ing holes fitting the reduced ends, the outer
surfaces of the caps being flush with the sur-
faces of the rods, connecting-wires secured
in the ends of the caps, a thin sheath of in-
15 combustible heat-conducting and electric in-
sulating material which surrounds the rods
and caps, and a plastic heat-conducting and
electric insulating material which surrounds
20 the sheath and retains the rods in the perfo-
ration of the casing.

9. A resistance device comprising carbon
rods surrounded by a sheath of incombusti-
ble electric insulation which is in turn sur-
rounded and secured within a support by
means of a plastic material. 25

10. An electric resistance comprising a
metal casing, resistance-conductors in the cas-
ing, a thin sheath of mica surrounding each
conductor, and a material filling the spaces
between the resistance-conductor and the cas- 30
ing, to insulate them from each other, con-
vey heat from one to the other, hold the con-
ductors secure within the casing, and exclude
air from the conductors.

In witness whereof I have hereunto set my 35
hand this 16th day of January, 1900.

CARL W. LARSON.

Witnesses:

BENJAMIN B. HULL,
MABEL E. JACOBSON.