

(No Model.)

J. E. MEEK.
ELECTRIC HEATER.

No. 567,247.

Patented Sept. 8, 1896.

Fig-1.

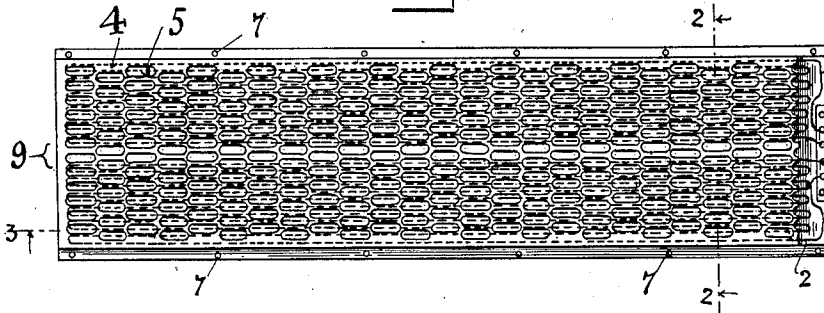


Fig-2

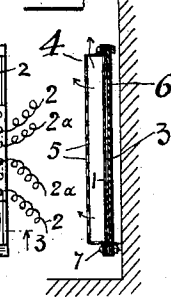


Fig-3.

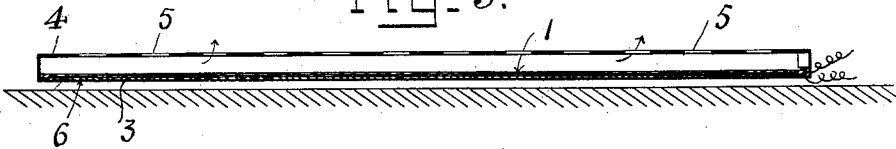


Fig-4.

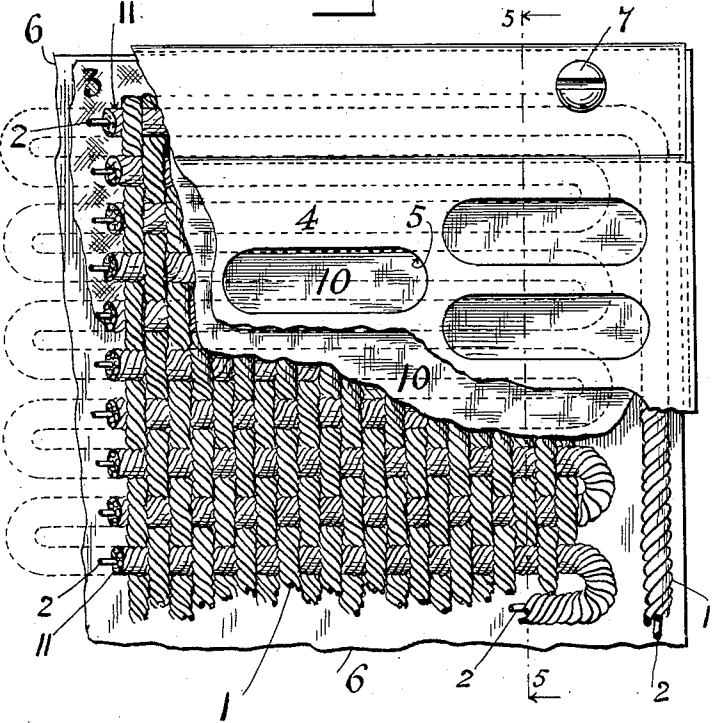
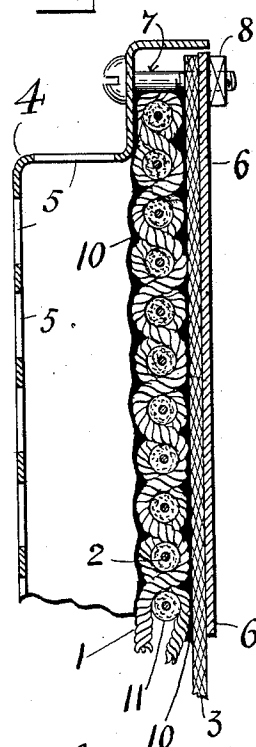


Fig-5.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN EMORY MEEK, OF NEW YORK, N. Y., ASSIGNOR TO THE H. W. JOHNS MANUFACTURING COMPANY, OF SAME PLACE.

ELECTRIC HEATER.

SPECIFICATION forming part of Letters Patent No. 567,247, dated September 8, 1896.

Application filed January 7, 1896. Serial No. 574,597. (No model.)

To all whom it may concern:

Be it known that I, JOHN EMORY MEEK, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electric Heaters, (Case A;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to electric heaters for heating the atmosphere in a chamber or compartment, and more especially is designed for use in electrically-propelled street-cars. The disadvantage under which many forms of electric heaters for street-cars heretofore made suffer is the fact that from their bulkiness and other features of construction it is impracticable to spread the heating-surface over a sufficient area of the car, but said heating surface is concentrated into two or four heaters, with the result that persons seated or standing near said center of radiation are scorched or warmed uncomfortably while passengers in other portions of the car are cold. To overcome this difficulty and obtain a heater the heating-surface of which will be widely distributed through the car, which shall take up little room and be cheap in construction and equable in its variations of heating effect, I have designed the form of apparatus illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of one of my heaters with a portion of the casing broken away at the right-hand end. Fig. 2 is a cross-section on line 2 2 of Fig. 1. Fig. 3 is a cross-section on line 3 3, Fig. 1. Fig. 4 is an enlarged detail view of a portion of the heater, other portions being broken away. Fig. 5 is a cross-section on line 5 5 of Fig. 4.

The main feature of my invention consists of a woven fabric of asbestos or other insulating and incombustible fiber, in the woof-thread of which is embedded an electric conductor. This electric conductor is preferably a fine iron wire, which has been covered with asbestos yarn by weaving, winding, or braiding the same about the wire. This fabric, with the embedded conductor, is cut into

sections and attached to any suitable backing, such as a piece of asbestos millboard, either by pasting, stitching, or tacking it to the same, and is then, or at a previous stage of the manufacture, treated with a proper quantity of "size" or other material for stiffening the fabric, rendering the asbestos fiber waterproof and otherwise fitting the fabric to withstand the conditions of use. This treatment may be by "japanning" or any other method well known in the arts. The fabric so stiffened and attached to the backing of insulating and incombustible board is then preferably placed in some light metal case to protect it from abrasion, and the case is then attached to the front of the longitudinal seats in the ordinary form of street-car.

Referring to the drawings, like reference-figures refer to like parts.

1 represents generally a section of a woven fabric of asbestos, with a metallic wire embedded in the woof of said fabric and serving as an electrical conductor. The terminals of the wire running through each section of the fabric are represented at 2 and 2^a. Of course, there are as many separate sections of said wire as there are sections of the heater, and they may be connected together either in series or in multiple arc, as desired.

11 is the insulating asbestos or other fiber of the woof-thread surrounding the conducting-wire 2, as best shown in Figs. 4 and 5.

3 is a backing of any kind of incombustible board, such as asbestos millboard, to which the asbestos fabric is attached either by pasting, stitching, or tacking.

4 is a light sheet-iron or wire or other metal frame placed over the heater and having the openings 5, through which the heated air may escape from the interior of the heater. This frame or shell 4 is attached to the metallic back 6 by means of the bolts 7 and the nuts 8, and in conjunction therewith forms a metallic shell or inclosing-frame for the heater.

9, Fig. 1, represents a strip or section through the woven fabric in which the conductor 2 is omitted from the woof thereof. This forms a heater into two electrically separate sections, each having its closed circuit or conductor 2. Of course, the conductor may be omitted from other intervening por-

tions of the woof of the fabric, and thereby are formed as many different sections as desired in the heater.

10, Fig. 5, represents the size or other stiffening and waterproofing substance, such as "japan," which protects the insulation from the action of moisture and gives the fabric a desirable stiffness sufficient to render it self-supporting independent of the backing 2, if necessary.

The method of operation of my invention is evident. The heaters are fixed to the side of the seat or other convenient portion of the interior walls of the car, and on account of the slight thickness of the heater and its complete insulation it takes up but little room and cannot scorch the passengers, even if their clothing is pressed against the face of the heater. A number of heaters are distributed throughout the car, and thereby the amount of heat necessary from each heater is reduced and the possibility of an uncomfortable degree of local temperature avoided. The conductors 2 2^a of the various sections are connected up in any proper way, but preferably similar sections of different heaters are connected in series, so that one section of each heater may be thrown in to produce a low temperature and two or more sections of each heater to produce higher temperature. In that way the temperature will be equable throughout the car whether high or low, and the disadvantages resulting from the usual method of cutting out one or more heaters

entirely while others are radiating their full amount of heat are obviated.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

1. An electric car-heater which consists of the combination of a woven fabric of asbestos, or similar incombustible and insulating fiber, with an electric conductor embedded in the woof of said fabric, and a backing of incombustible millboard to which said fabric is attached, said fabric having a proper quantity of "size" or other material for stiffening applied thereto, substantially as described.

2. An electric car-heater which consists of the combination of a woven fabric of asbestos, or similar incombustible and insulating fiber, with an electric conductor embedded in the woof of said fabric, and a backing of incombustible millboard to which said fabric is attached, said fabric having a proper quantity of "size" or other material for stiffening applied thereto, said fabric being divided into two or more electrically separate sections by the omission of the conductor from the intervening threads of the woof, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN EMORY MEEK.

Witnesses:

A. PARKER SMITH,
F. S. MILLER.