A. S. CUBITT.

ELECTRIC HEATER.

APPLICATION FILED FEB. 16, 1910.

964,759. Patented July 19, 1910.

Fig. 2.

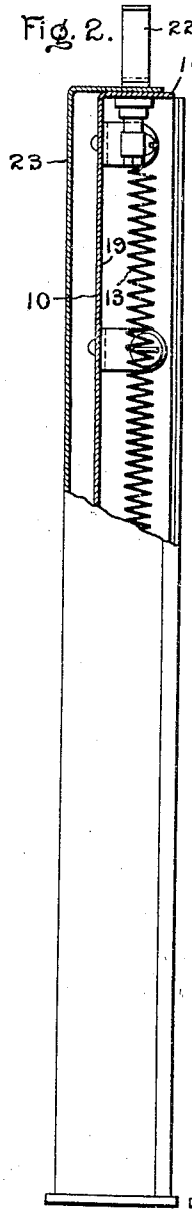


Fig. 1.

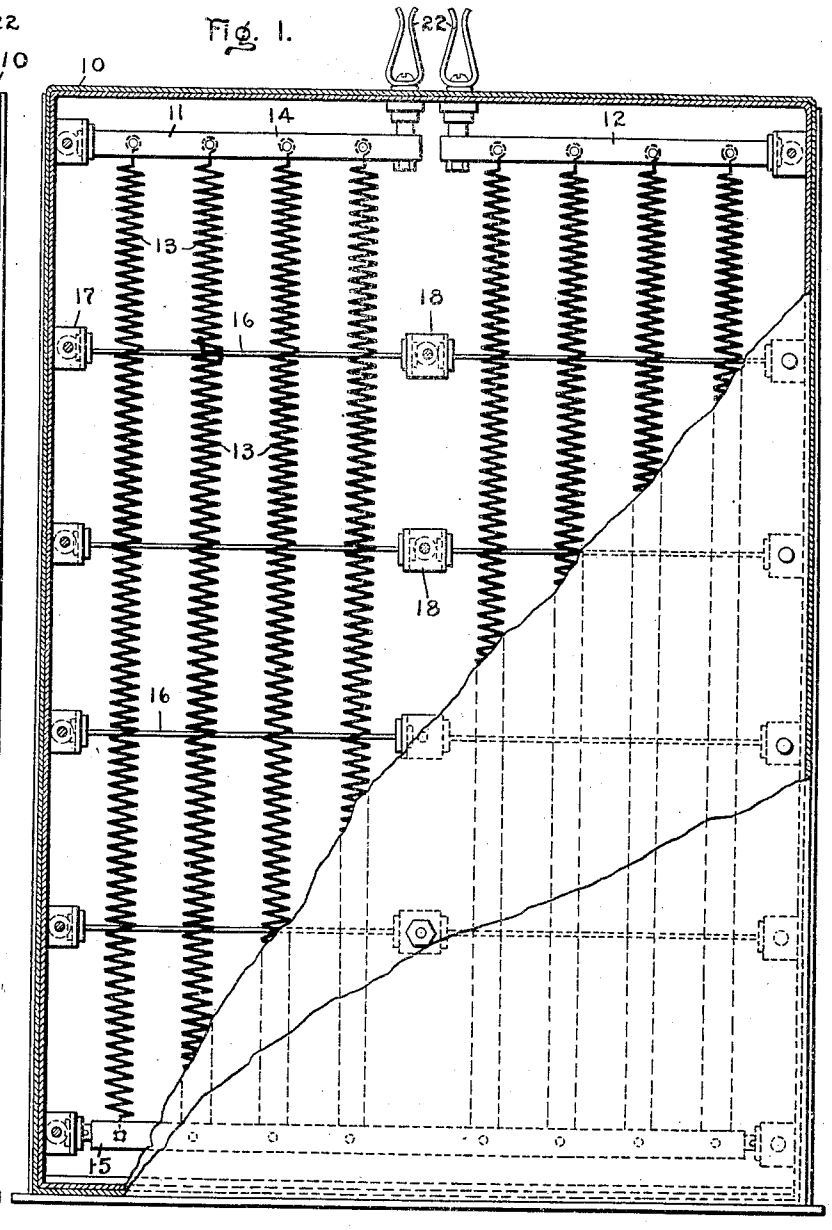
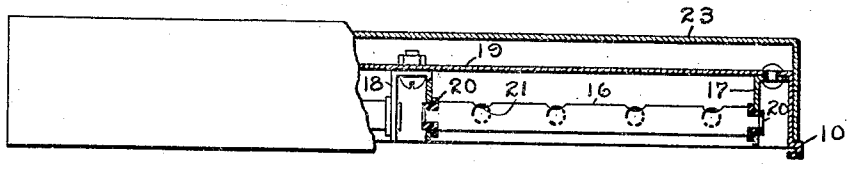


Fig. 3.



WITNESSES:

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ELECTRIC HEATER.

964,759. Specification of Letters Patent. **Patented July 19, 1910.**

Application filed February 16, 1910. Serial No. 544,150.

To all whom it may concern:

Be it known that I, ARCHIBALD S. CUBITT, a subject of the King of Great Britain, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

This invention relates to electric heaters and the like and has for its object the provision of a device of this character in which the heating element is so arranged that the device may be constructed in a simple and inexpensive manner and at the same time be thoroughly efficient and durable.

My invention relates more specifically to means for supporting the heating element of electric heaters.

In carrying out my invention I employ, instead of the single coil which is commonly used, a plurality of coils arranged in multiple. The coils are supported at their ends in the usual fashion. In order to support the coils at intermediate points in an inexpensive way, I provide non-insulating supports which engage the coils at equi-potential points. These supports are in the form of strips which engage the various coils so as to support them and are themselves supported at their ends. This arrangement facilitates the manufacture and assembling of the heating coils and eliminates a large portion of the insulation which has heretofore been employed.

Other objects of my invention will appear in the course of the following specification, in which I have shown my invention embodied in concrete form for purposes of illustration.

Referring to the drawing, Figure 1 represents a plan view of an electric heater embodying my invention, the top being broken away to show the arrangement of the coils; Fig. 2 represents a side view of the same likewise partially broken away; and Fig. 3 represents an end view with a portion of the casing removed to show the structure.

Referring to the drawing, 10 represents a frame of an electric heater which may be an electric stove, or the like. Mounted within this frame, which is rectangular in shape, are a plurality of heating sections. In this case I have shown two sections, 11 and 12, arranged in series. These two sections are identical and a description of one of them is therefore sufficient. Each section comprises a plurality of parallel coils 13, each having one end connected to a common metallic bar 14, while the opposite ends are connected to a longer metallic bar 15, which is common to the coils of both sections. These coils being electrically connected at their opposite ends by metallic bars are arranged to operate in multiple. These coils are formed of high resistance conductors which may be of the character disclosed in the patent of John T. H. Dempster, No. 901,428. The coils are of considerable length and in order to make the structure rigid it is necessary to support them at intermediate points. To do this in a convenient way, I provide intermediate supports composed of a series of parallel transverse members 16. These members are of metal and are directly in contact with the coils. In order to avoid any lack of uniformity in the heat, or any undue heating in any section of the coils, I arrange to have these transverse members engage the coils at points of equal potential. The coils all being of the same diameter and the wires of uniform cross section, the point of equi-potential will be found at equal distances from the points of support. In other words, there will be the same number of turns of the wire in each coil between the various transverse members. These transverse members are fastened at one end in supports 17 arranged along the side of the frame and have their other ends in supports 18 arranged along the center of the frame. The supports themselves are held in place by being secured to the metallic plate 19 which forms the top of the frame 10. The supports 17 are secured to the plates by riveting, whereas the supports 18, which are common to the transverse members of both sections 11 and 12, are secured by means of a bolt and nut. The transverse strips 16 are insulated from the supports by insulating bushings 20. These transverse plates are likewise provided with curved depressions 21 for receiving the coils as shown in Fig. 3. The coils are simply slipped onto the supports so that the latter pass between the turns. The terminals 22 are provided, one for each section of resistance, so that the current passes from one of the terminals through the coils on one side in multiple in

one direction and thence back through the coils on the other side and out through the other terminal. The frame 10, with its coils, is inclosed in an outside casing 23.

It will be seen that I have provided a very simple and efficient arrangement for supporting the coils at intermediate points, and while I have shown my invention embodied in specific structure for purposes of illustration in accordance with the patent statutes, it should be understood that I do not limit my invention thereto, since various modifications thereof will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

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

1. An electric heater comprising a plurality of coils supported at their ends and connected to operate in multiple, and an intermediate support common to the coils and electrically connecting the same at equi-potential points.

2. An electric heater comprising a plurality of coils supported at their ends and connected to operate in multiple, and a plurality of intermediate supports common to the coils and electrically connecting the same at equi-potential points.

3. An electric heater comprising a plurality of parallel coils supported at their ends and connected to operate in multiple, and an intermediate support common to the coils and electrically connecting the same at equi-potential points.

4. An electric heater comprising a plurality of coils supported at their ends and connected to operate in multiple, and a transverse metallic member engaging the coils at equi-potential points to support the same.

5. An electric heater comprising a plurality of parallel coils supported at their ends and connected to operate in multiple, and transverse parallel metallic members engaging the coils at equi-potential points to support the same.

6. An electric heater consisting of resistance sections connected in series, each section comprising a plurality of coils supported at their ends and connected to operate in multiple, and an intermediate support common to the coils and electrically connecting the same at equi-potential points.

7. An electric heater consisting of resistance sections connected in series, each section comprising a plurality of coils supported at their ends and connected to operate in multiple, and transverse metallic members engaging the coils at equi-potential points to support the same.

In witness whereof, I have hereunto set my hand this 10th day of Feb., 1910.

ARCHIBALD S. CUBITT.

Witnesses:
JOHN C. MUSGROVE,
WILLIAM MAYNARD.