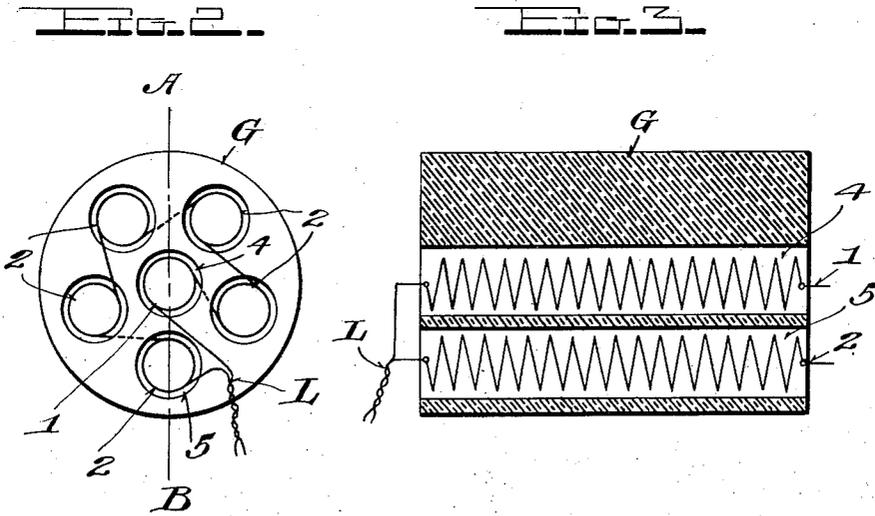
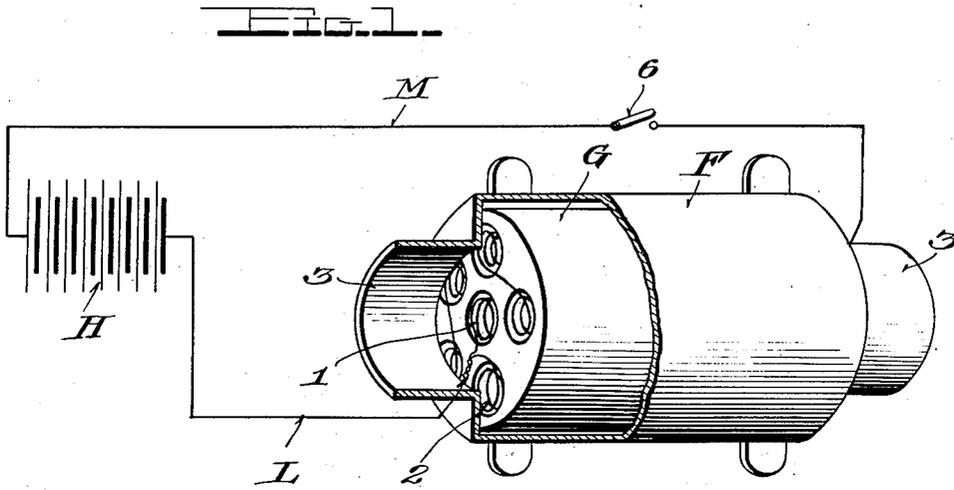


A. P. NICHOLS.
 ELECTRICALLY OPERATED AIR HEATING DEVICE.
 APPLICATION FILED OCT. 18, 1919.

1,333,933.

Patented Mar. 16, 1920.



Witness
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UNITED STATES PATENT OFFICE.

ANDREW P. NICHOLS, OF BRIDGEPORT, CONNECTICUT.

ELECTRICALLY-OPERATED AIR-HEATING DEVICE.

1,333,933.

Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed October 18, 1919. Serial No. 331,619.

To all whom it may concern:

Be it known that I, ANDREW P. NICHOLS, a citizen of the United States, residing at the city of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Electrically-Operated Air-Heating Devices; and I do 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.

This invention relates to certain new and useful improvements in an electric heater and more especially to a heater for air and gas, and it has for its primary object to provide a simple and compact heater which can be attached to a fluid conduit for raising the temperature of the air or gas as it flows therethrough.

A further object is to provide an efficient and practical heater substantially permanent in its character and not likely to get out of order when operating under difficult or adverse circumstances.

The invention further resides in the features of construction hereinafter described and claimed reference being had to the accompanying drawings wherein—

Figure 1 is a perspective view of my improved heater, part of the casing of which is broken away and the wiring connection with the source of electrical energy diagrammatically depicted.

Fig. 2 is an end elevation of the heating unit *per se*; and

Fig. 3 is a longitudinal section there-through on line 3—3 of Fig. 2.

The casing or chamber F is designed for insertion in the conduit through which fluid is drawn or forced, and is preferably considerably larger than the conduit. Consequently, the ends of the chamber have reduced nipples 3 for ready coupling into the conduit.

Within the heating chamber is a core G of insulating material and preferably conforming in shape to that of the chamber, the shape here given being cylindrical. This cylindrical core or block is provided with an axial bore 4 and a surrounding series of like bores 5 extending lengthwise therethrough, and within these bores are arranged the heating elements or resistance coils 1 and 2 which are electrically connected by wires L

and M passing properly insulated through the walls of the chamber to a source of energy, such as battery H.

By means of a switch 6 the source of electrical energy can be connected to and disconnected from the heating unit as occasion may warrant whereby the fluid will have its temperature raised or otherwise controlled as it flows through.

The length of the chamber F is of course determined by the length of the core G, which will be determined by the particular occasion for which the device is intended for use. Where, for any reason, it is impracticable to raise the temperature of the resistance coils 1 or 2, or both, beyond a certain point, the temperature to which the air passing through the device is raised must be determined by the length of the core G, and the velocity of the air drawn or driven through the passage or bore. The greater the velocity of the air or the greater the temperature desired to be attained, the longer must be the heated passage in the core G, through which the air is conducted.

What is claimed is:

1. A fluid heater composed of a casing having reduced end parts forming lateral shoulders, an insulating core in the casing having its ends arranged adjacent to the respective shoulders and having a series of axial fluid passages therethrough and a heating coil loosely placed in each passage, the coils having convolutions of equal diameter and being spaced throughout their peripheries from the walls of the passages, the ends of the coils being disposed adjacent to the shoulders and the latter extending over the ends of most of the passages.

2. A fluid heater composed of a casing having reduced end parts forming lateral shoulders, an insulating core in the casing having its ends arranged adjacent to the respective shoulders and having a series of axial fluid passages therethrough and a heating coil loosely placed in each passage, the ends of the coils being arranged adjacent to the shoulders and the latter extending over the ends of most of the passages.

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

ANDREW P. NICHOLS.

Witnesses:

F. W. SMITH,
M. T. LONGDEN.