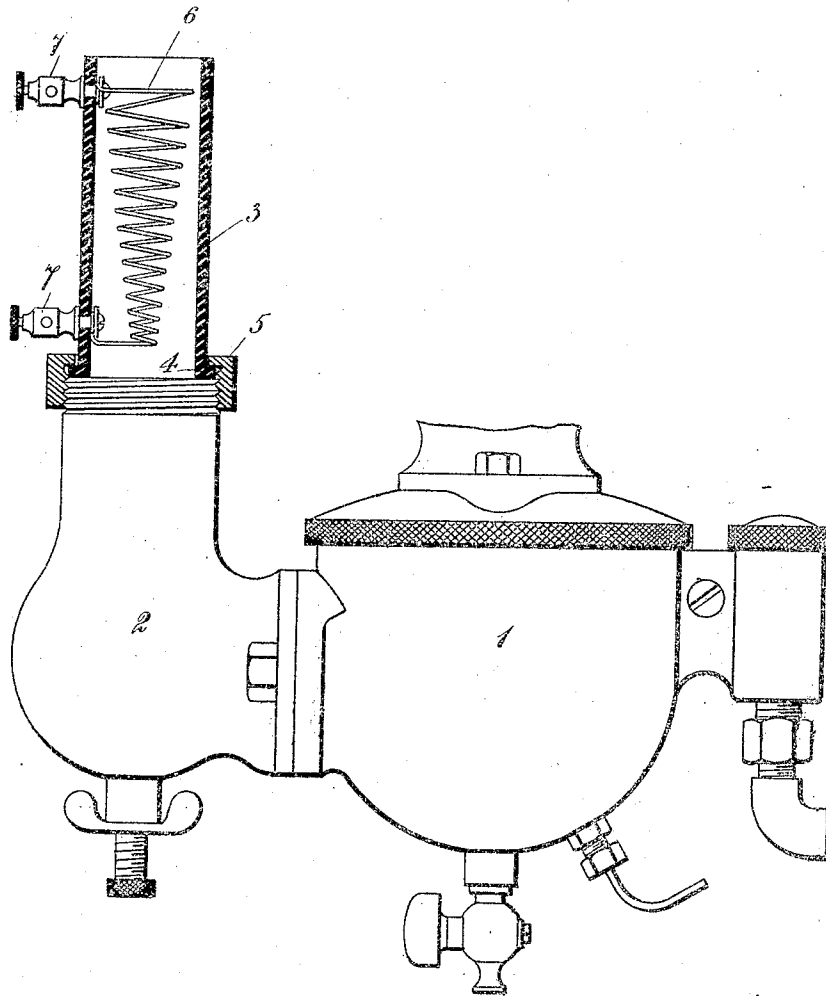


L. A. BILL.  
ELECTRIC AIR HEATER.  
APPLICATION FILED DEC. 14, 1912.

1,064,190.

Patented June 10, 1913.



WITNESSES=  
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Patrick J. Conroy

INVENTOR=  
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attys.

# UNITED STATES PATENT OFFICE.

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TRUSTEE, OF CAMBRIDGE, MASSACHUSETTS.

## ELECTRIC AIR-HEATER.

1,064,190.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed December 14, 1912. Serial No. 736,632.

*To all whom it may concern:*

Be it known that I, LESTER A. BILL, a citizen of the United States, and a resident of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Electric Air-Heaters, of which the following is a specification.

My invention relates to electric air heaters and its object is to improve, simplify and cheapen the construction of such heaters in the manner hereinafter set forth.

My invention will be described in connection with the drawing which accompanies and forms a part of this specification, and which shows a longitudinal section of one embodiment of the same.

In the particular drawing selected for more fully disclosing my invention, 1 represents a well known type of carbureter having an air-intake pipe 2 to which my improved heater is attached. In the present instance the flange 4 of the heater-tube 3 is secured to the air-intake by the flanged nut 5, although it will be understood that any suitable means may be employed for this purpose. The heater-tube 3 may as shown be of fiber or other suitable insulating material, or else of conducting material, in which case the heating element must of course be insulated therefrom.

The heating element is herein shown as a coil of wire 6 having its terminals connected to the binding posts 7, 7. Preferably the coil is cone-shaped, open at both ends, and tapering toward the air-intake. It forms a hollow, metallic, conical-shaped body and is so arranged that every particle of air which passes into the carbureter must come into contact with some portion of its radiating surface.

It will be noted that the heater-tube forms a direct extension of the air-intake pipe and that, therefore, the air has a free and uninterrupted passage to the carbureter, as distinguished from similar devices in which the air must pass through restricted passages in order to reach the intake pipe.

It will be obvious that my improved heater may be very cheaply constructed and experience has shown that the energization thereof for fifteen seconds will enable the operator to start an automobile gas-engine in the coldest weather as easily as in summer.

Various modifications may be made in the heater which I have specifically described without departing from the principle of my invention.

I claim:

An electric air-heater comprising a cylindrical tube of uniform diameter throughout, and having unrestricted open ends, said tube being adapted for attachment to an air intake pipe and forming a direct extension thereof, and an electric heating element comprising a wire coil freely supported inside of said tube, said coil being of conical shape, the large end thereof being substantially of the same diameter as said tube but out of contact with the walls thereof, whereby a straight free air passage through said tube is provided, and whereby the air currents throughout substantially the entire cross-section of said tube are brought into contact with the radiating surface of said coil.

In testimony whereof, I have hereunto subscribed my name this 11 day of Dec. 1912.

LESTER A. BILL.

Witnesses:

E. B. TOMLINSON,  
GEO. K. WOODWORTH.