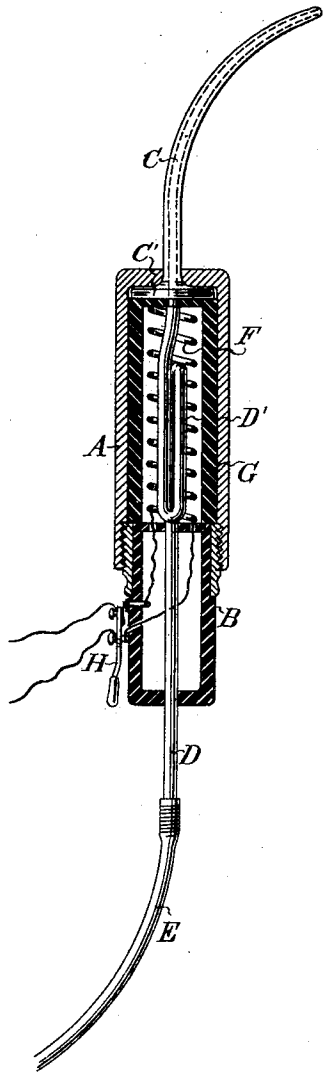
No. 636,090. Patented Oct. 31, 1899.

E. R. WATERMAN & R. R. MORISON.

AIR HEATER.

(Application filed May 11, 1899.)

(No Model.)



Witnesses,
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UNITED STATES PATENT OFFICE.

EDWIN R. WATERMAN AND ROBERT R. MORISON, OF SAN FRANCISCO, CALIFORNIA; SAID WATERMAN ASSIGNOR TO PERCY S. REGNART, OF SAME PLACE.

AIR-HEATER.

SPECIFICATION forming part of Letters Patent No. 636,090, dated October 31, 1899.

Application filed May 11, 1899. Serial No. 716,344. (No model.)

To all whom it may concern:

Be it known that we, EDWIN R. WATERMAN and ROBERT R. MORISON, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Air-Heaters; and we hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to an apparatus which is especially designed for heating air.

It consists, essentially, of a cylindrical casing, a nozzle removably connected therewith, a tube and coil passing into said casing and connecting with the nozzle, an electrical heater surrounding said tube, and a handle and means for applying or cutting off an electrical current, whereby the air passing through the tube is heated to any desired degree.

In dental work it is necessary to apply a current of air to dry the teeth or cavities therein, and when the teeth are extremely sensitive a current of cold air causes the patient great distress.

It is the object of this invention to provide a convenient heater in conjunction with a nozzle through which a current of warm air may be directed into the cavity or upon the part where it is desired to use it and to so temper the heat of this air-current as to prevent its unduly distressing the patient.

In carrying out the invention we have shown, in the figure of the drawing, an exterior casing A open at the rear and having a removable insulated handle portion B, connected therewith by a screw or otherwise. The front end of the casing A has a central opening of sufficient diameter to receive the nozzle C. This nozzle has an expanded base, as shown at C', the base being of sufficient diameter to approximately fit the interior of the cylinder-chamber A, and when the nozzle is inserted through the opening it is put into place from the rear, the part C' fitting up against the inside of the closed end, as shown. This nozzle may be of any appropriate type. It is herein shown as curved to facilitate the application of the air to the teeth, and it is of a readily-removable character, and when once seated, as shown, its base forms a close joint with the closed end of the casing.

D is a pipe which is preferably made of copper and is connected at one end with a flexible hose E or other air-conveyer. Air may be forced through this by a hand compression-bulb or by any suitable means if power is available to furnish a desired current. This tube D extends through the center of the chamber A and is preferably bent to form one or more turns, as at D', within the chamber A. Surrounding this tube and coil is an electrical heating device F of any suitable description. As here shown, it consists of a coil of resistance-wire, through which an electrical current may be passed and the wire heated by said current, so that the heat passing through the wire will be imparted to the inner tube and coil D'.

G is an insulating-lining to the chamber A, which surrounds the heating-coil and insulates it from metallic contact with the casing.

Upon the side of the handle extension B is fixed a spring-pressed contact-piece, as shown at H. This contact-piece is placed intermediate between the wires of the heating-coil and the source of electrical supply and is normally open. It is closed by pressure of the hand, so that the electrical current will pass through the coil, and the air-conducting tube D D' will be sufficiently heated, so that the air passing therethrough will be delivered through said tube into the nozzle C and thence directed to the point where it is to be used.

The degree to which the air is heated is easily controlled by means of the contact device H, and the apparatus is always in readiness for use whenever needed.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. An air-heater comprising the combination of an outer casing having a removable handle portion fitted to its rear end, an air-conducting pipe interior to the casing, a heater surrounding the pipe, a nozzle inserted in place through the rear end of the casing and having an enlarged base-flange to seat against the interior of the front end of the casing, and a connection through which air is delivered through the heating-pipe.

2. An air-heater for dental and other purposes consisting of an exterior cylinder hav-

ing an open rear end and a handle portion removably fitted to said open end, an interior air-conducting heating pipe and coil, a nozzle connecting with the discharge end of the pipe, an electrical heater surrounding the air-pipe and an insulating surrounding therefor, wires connecting said heater with the source of electrical supply and a contact making and breaking device interposed in the electrical circuit.

3. An air-heating device consisting of an exterior casing having an open rear and a central opening formed at the front end, a slidable nozzle inserted in place through the open end of the cylinder and slidably fitting through said opening having an enlarged base-flange fitting within the interior of the casing, an air-conducting tube and coil extending through the casing and connecting with the nozzle, a surrounding insulated electrical heater whereby the coil and passing air are heated, an insulating-handle with which the casing is connected, wires connecting the heater with a source of electrical supply and interposed contacts whereby a normally open circuit is maintained, said circuit being closed by pressure upon the contact device to control the action of the heater.

In witness whereof we have hereunto set our hands.

EDWIN R. WATERMAN.
ROBERT R. MORISON.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.