J. E. REID AND F. W. SIDE.

HOT AIR DENTAL SYRINGE.

APPLICATION FILED MAY 21, 1919.

1,313,861. Patented Aug. 19, 1919.

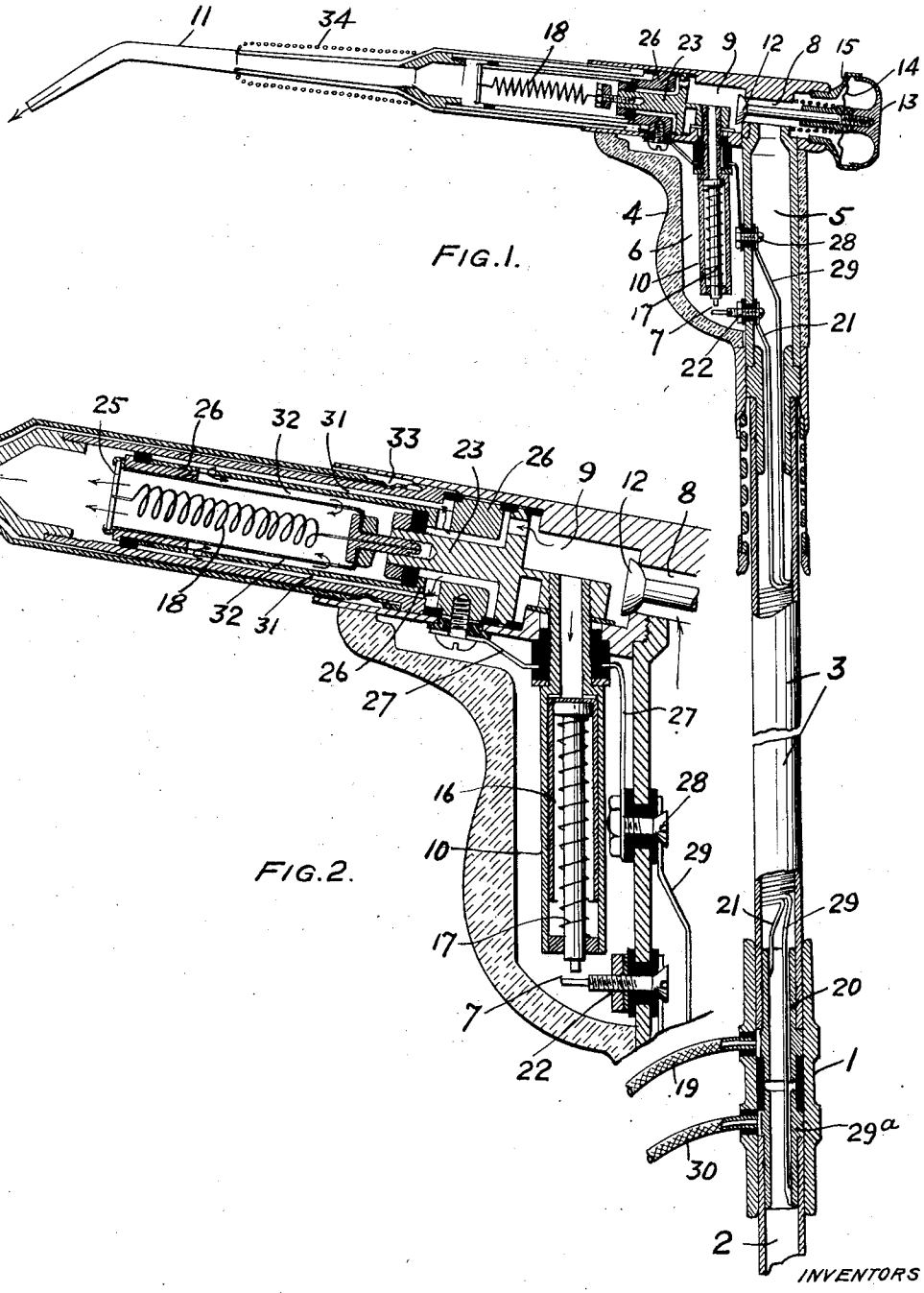


FIG. 1.

FIG. 2.

WITNESS:

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HOT-AIR DENTAL SYRINGE.

1,313,861. Specification of Letters Patent. Patented Aug. 19, 1919.

Application filed May 21, 1919. Serial No. 298,752.

To all whom it may concern:

Be it known that we, JAMES E. REID, a citizen of the United States, residing at Moorestown, Burlington county, State of New Jersey, and FREDERICK W. SIDE, a citizen of the United States, residing at Camden, Camden county, State of New Jersey, have jointly invented certain new and useful Improvements in Hot-Air Dental Syringes, of which the following is a specification.

The principal objects of the present invention are, first, to prevent over-heating the instrument, second, to simplify and improve the construction, combination and arrangement of its parts, third, to provide for efficiently and inexpensively preventing leakage of air under pressure, and fourth, to furnish a reliable, durable and satisfactory hot air dental syringe.

Other objects will appear from the following description of the invention which will be claimed at the end hereof, but first described in connection with the embodiment of it selected from other embodiments of it for the sake of illustration in the accompanying drawings forming part hereof and in which—

Figure 1, is a sectional view, somewhat diagrammatic, of a hot air dental syringe embodying features of the invention, and

Fig. 2, is a sectional view of the upper part of the syringe drawn to an enlarged scale.

Generally stated, the instrument is constructed of tubular parts and is supplied with air and with electric current by means of which the air is heated, and one advantage of the invention is that the heat is not available in the absence of air to be heated, so that there is no danger of overheating any part of the instrument.

In the drawings the fitting 1, is suitably supported and connected, as by a connection 2, with a source or supply of air under pressure. The fitting 1, is connected with the hand piece by means of a flexible tubular connection 3, and the hand piece is tubular or hollow and provided with a hollow grip 4, providing two internal chambers 5 and 6, of which one 5, always receives air under pressure from connection 3, and of which the other 6, contains an air actuated spring return plunger make and break device 7. The hand piece also contains a valve chamber 8, and an air chamber 9, communicating with the cylinder element 10, of the plunger device and with the nozzle 11. The valve 12, is provided with a stem acted upon by a spring to close the valve, and this stem is provided with an operating handle 13, which is pushed to open the valve and released to permit its spring to close the valve. 14, is a yielding diaphragm, as of corrugated thin sheet metal, interposed between and secured to the valve spindle and to the fixed fitting 15, of the chamber 8, and it prevents the escape of air from the valve chamber 8, and permits of free movement of the valve and its handle. When the valve 12, is open air enters the air chamber 9, and reaches the plunger 16, which it operates against its spring 17, closing the contact at 7. Current reaches the air heater 18, by the following circuit which of course may be traced in either direction. From lead 19, to insulated thimble 20, by coiled conductor 21, to insulated binding post 22, then by contacts to the cylinder element 10, to the ported insulated plug 23, to the heater 18, and thence by bridge 25, to the insulated shell 26, and by conductor 27, to insulated binding post 28, and by coiled conductor 29, to insulated thimble 29^a, and to lead 30. Thus when air under pressure reaches the plunger device 7, and only when air under pressure reaches the plunger device 7, is the circuit closed and the heater heated. At all other times the circuit is open by the action of the spring 17. From the chamber 9, air under pressure passes by way of ports or channels in the plug 23, and the passages 31 and 32, to the heater where it is heated and thence the heated air passes to the nozzle 11. If necessary the opening from the air chamber 9, to the cylinder element 10, may be larger than the ports in the plug 23, in order to insure pressure for working the plunger device. When the air under pressure is shut off at the valve 12, the cylinder element 10, exhausts through the nozzle and the spring 17, immediately breaks the circuit at the contacts. Thus there is no possibility of the heater being overheated because when air under pressure is absent the electric current is off.

The nozzle 11, is turnable and detachable because it is mounted on a cylindrical portion or extension of the hand piece, and is detachably connected by a projection-and-groove connection 33. 34, is a wire guard.

It will be obvious to those skilled in the art that modifications may be made in details of construction and arrangement without departing from the spirit of the invention, hence the invention is not limited to those matters or in any way other than the prior art and the appended claims may require.

We claim:

1. A hot air dental syringe including the combination of an electric air heater and its circuit connections, a supply of air under pressure and its controlling valve, and a circuit maker and breaker interposed in said connections and responsive to air pressure on the outlet side of the valve and adapted to make and break the circuit of the heater.

2. A hot air dental syringe including in combination an electric air heater, a supply of air under pressure, and controlling means for simultaneously turning the air and heater off and on, substantially as described.

3. A hot air dental syringe including in combination, an electric air heater and its circuit connections, a supply of air under pressure and its controlling valve, and a spring return plunger actuated circuit maker and breaker interposed in said connections and exposed to the outlet side of said valve, substantially as described.

4. In a hot air dental syringe the combination of a hollow hand piece containing a valve chamber and an intercommunicating air chamber, a valve between said chambers and operable from the exterior of the hand piece, an electric air heater in communication with the air chamber, and an electropneumatic device exposed to the interior of the air chamber and adapted to regulate the heater, substantially as described.

5. In a hot air dental syringe the combination of an electric air heater and its supply of air under pressure, and an electropneumatic device for regulating the heater.

6. In a hot air dental syringe the combination of a hand piece having a cylindrical tubular extension through which cold air circulates and a nozzle having an elongated tubular shank turnably mounted on the extension and cool to the hand by air circulation.

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