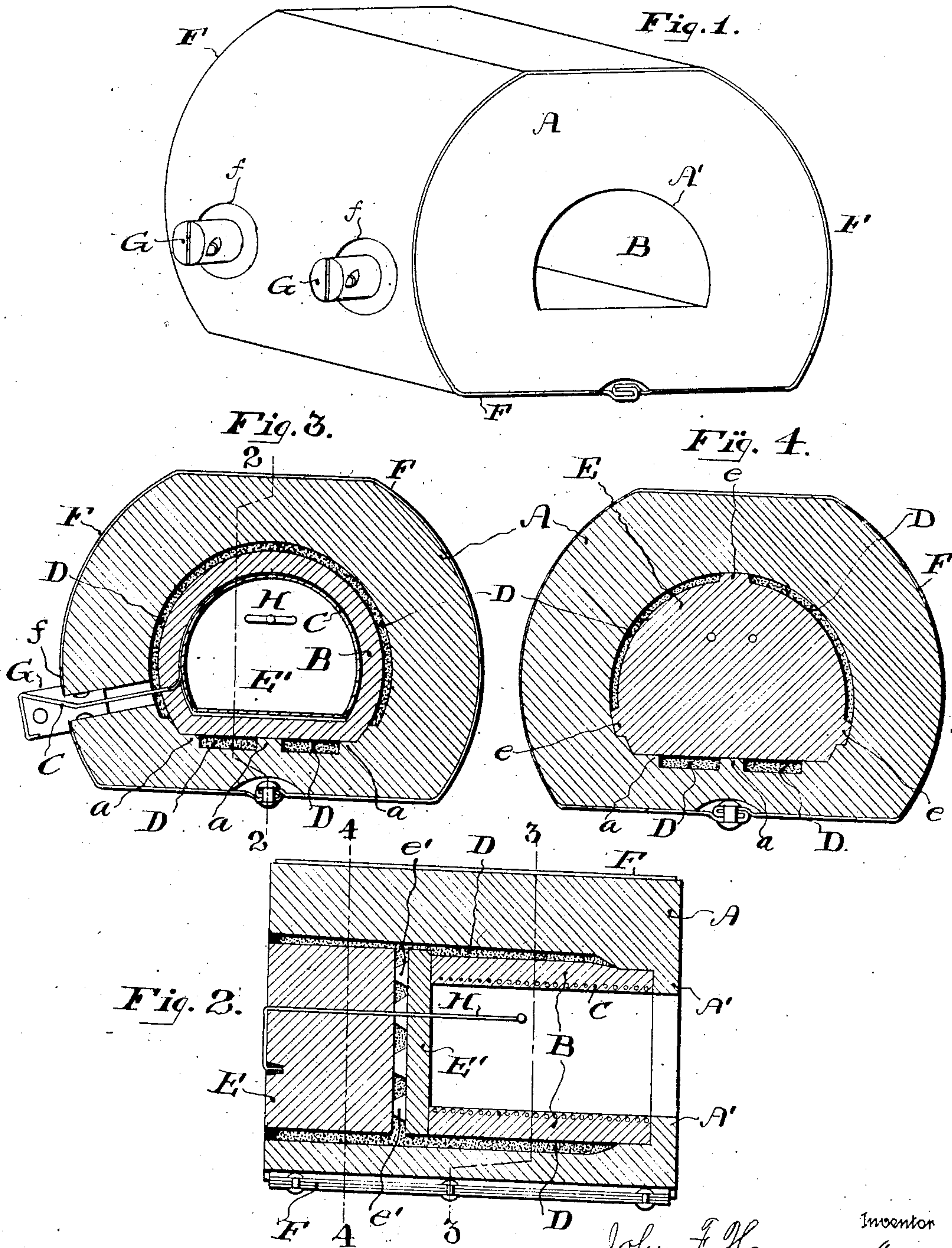


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ELECTRIC FURNACE MUFFLE.
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904,529.

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ELECTRIC-FURNACE MUFFLE.

No. 904,529.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOHN F. HAMMOND and RALPH B. SAVIN, citizens of the United States, the former residing in Prince Bay, in the county of Richmond, in the State of New York, and the latter residing in Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Electric-Furnace Muffles; and we do hereby 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.

Our invention relates to muffles for electric furnaces of the class used by dentists and others who require a furnace of small size in which the muffle is subjected to widely varying temperatures ranging from low to exceedingly high.

The object of our invention is to increase the durability of muffles of this class, to enable them to be more easily repaired, and to otherwise increase their efficiency.

The invention consists in the improvements indicated in the accompanying drawings, described in the following specification and claimed at the conclusion thereof.

In said drawings Figure 1 is a perspective view of our improved muffle. Fig. 2 is an endwise, vertical sectional view thereof on the line 2—2 of Fig. 3. Fig. 3 is a crosswise, vertical sectional view on the line 3—3 of Fig. 2. Fig. 4 is a similar sectional view on the line 4—4 of Fig. 2.

The muffle consists of an outer member, shell, or dome A and an inner member or muffle proper B, both of which are of refractory material, as fire clay. The dome is hollow and open at both ends, but at its front end it is of less external diameter, being formed with a flange A'. Likewise, the muffle, as the inner member will be herein designated, is hollow and open at both ends, but unlike the dome it has no flange at its front end. It is shorter than the dome and is wired in the usual manner as indicated by the letter C. The internal diameter of the front end of the dome corresponds to the internal diameter of the muffle; or, in other words, the opening formed by the dome flange is of the same size and shape as the interior of the muffle, so that the inner walls of the muffle are flush or substantially flush

with said opening in the front of the dome. This opening constitutes the muffle opening or door through which objects are placed in and removed from the muffle chamber, which is formed by the hollow of the muffle. The external diameter of the muffle is smaller than the internal diameter of the dome, whereby a space D is formed between the muffle and dome. This space is best filled with a powdered or granular refractory material for retaining the heat in the muffle. For the purpose of properly spacing or centering the muffle in relation to the dome, projections are provided which may either be on the interior of the dome or on the exterior of the muffle. The preferred form of such projections consists, as shown, of ribs or shoulders *a* on the interior of the dome and extending from one end to the other thereof.

A plug of fire clay or other suitable material is inserted into the rear of the dome behind the muffle and cemented in place, this plug serving to close the rear end of the dome as well as the rear end of the muffle. This plug may consist of a single piece, or as shown, it may consist of two sections E and E'. The section E' rests directly against the rear end of the muffle, while the section E closes the rear end of the dome, the two sections being spaced from each other, as by lugs *e'* on one or the other of the sections. The plug or plugs as the case may be, correspond in shape but are somewhat smaller than the internal diameter of the dome, and are best formed with lugs *e*, shown in Fig. 4, adapted to center the plug or plugs. The space between the plug sections, if a sectional plug is used, and the space between the plug and the walls of the dome, may be filled with loose refractory material.

As a protection against external injury to the dome and also for holding it together should it become fractured in use, the same may be surrounded by a sheet metal jacket F completely covering the top, bottom and sides of the dome, and fitting it closely, but leaving the ends of the dome and the front of the muffle exposed. Metal contact posts G are inserted into and project from the side of the dome and the opposite ends of the muffle wire C are passed through openings in the side of the dome and through

openings or slits in said posts. The posts serve as contacts for electrically connecting the muffle with the source of electrical supply, thus adapting the muffle for use with a furnace having spring contacts so constructed that when the muffle is placed in its support on the furnace, electrical connection is automatically made between the posts of the muffle and the spring contacts of the furnace. The metal jacket F where the contact posts project from the dome is formed with openings *f* larger than said posts in order that the latter will not come in contact with the jacket.

In assembling, the muffle B is introduced into the dome A until its front end abuts against the flange A' of the dome, the projections *a* serving to center the muffle and to insure the interior thereof registering with the front opening of the dome. Before this is done, however, the ends of the muffle wire C are connected to the contact posts G, as above explained. The space between the muffle and dome is now filled with the loose material, after which section E' of the plug is inserted in the rear end of the dome until it comes in contact with the muffle. Then the other section E of the plug is inserted and cemented in place, the loose filling first being placed in the space between the plug sections and between the plug and dome. To remove the muffle for repairing it or for substituting a new one, the cement which holds the plug in place is scraped away, the plug or plugs removed and the muffle taken out.

The chief advantage of our improved muffle is that it may be quickly, easily and accurately assembled and taken apart for repair. Moreover, it is strong and durable and also of increased efficiency. The closely fitting metal jacket renders it possible to make the dome of softer material than could otherwise be employed.

By using two or more plugs, or plug sections, domes of the same length may be used with muffles of different lengths, the difference being taken up by varying the space between the plug sections or by using more or less plugs.

If the muffle is to be used with a furnace provided with a pyrometer, a thermo-couple H may be carried by the plug or plugs which close the rear end of the muffle. Herein lies another advantage of our invention because the thermo-couple is more easily inserted in and connected to the plug or plugs before they are secured to the dome than it can be inserted in and connected to the usual solid backs of the muffle and dome.

We claim as our invention:—

1. An electric furnace muffle comprising a hollow, electrically-wired inner member, open at both ends, a hollow outer member longer than the inner member, said outer

member being open at both ends and formed with a flange at its front end, and a plug fitting in the rear end of the outer member for closing the rear end of the inner member and holding the same in place.

2. An electric furnace muffle comprising a hollow, electrically-wired inner member, a hollow outer member longer than the inner member, said outer member being open at both ends and formed with a flange at its front end, the internal diameter of the inner member substantially corresponding to the diameter of the opening formed by the flange of the outer member, and a plug fitting in the rear of the outer member for holding the inner member in place.

3. An electric furnace muffle comprising an outer member or dome having a chamber, an opening in the rear of said member coincident with the diameter of said chamber, an opening in the front smaller than the diameter of said chamber, a hollow, electrically-wired inner member or muffle shorter than the outer member and located in the chamber thereof and having an internal diameter substantially equal to the opening in the front of the outer member, and a plug filling the rear opening of the outer member for holding the inner member in place.

4. An electric furnace muffle comprising a refractory, hollow, electrically-wired inner member, a refractory, hollow outer member longer than the inner member and the internal diameter of which is greater than the external diameter of the inner member, said outer member being open at both ends and having a flange at its front end, and a plug fitting in the rear end of the outer member, the space between the inner and outer members being filled with loose refractory material.

5. An electric furnace muffle comprising a hollow, electrically-wired inner member, a hollow outer member longer than the inner member and the internal diameter of which is greater than the external diameter of the inner member, said outer member being open at both ends and having a flange at its front end, and also having internal projections upon which the inner member rests, and a plug fitting in the rear end of the outer member.

6. An electric furnace muffle comprising a hollow, electrically-wired inner member, a hollow outer member longer than the inner member and the internal diameter of which is greater than the external diameter of the inner member, said outer member being open at both ends and having a flange at its front end, and also having an internal projection or projections extending lengthwise of the member, the inner member resting upon said projection or projections, and a plug fitting in the rear end of the outer member.

7. An electric furnace muffle comprising a

hollow, electrically-wired inner member, a hollow outer member longer than the inner member and the internal diameter of which is greater than the external diameter of the inner member, said outer member being open at both ends and having a flange at its front end, and also having a central bottom projection and side projections, the inner member resting upon said projections, and a plug fitting in the rear end of the outer member.

8. An electric furnace muffle comprising a hollow, electrically-wired inner member open at both ends, a hollow outer member longer than the inner member, said outer member being open at both ends and having a flange at its front end against which the inner member abuts, a plug in the rear of the outer member abutting against and closing the rear end of the inner member, and another plug closing the rear end of the outer member and spaced from the first mentioned plug.

9. An electric furnace muffle comprising a hollow, refractory, electrically-wired inner member open at both ends, a hollow refractory outer member longer than the inner member and the internal diameter of which is greater than the external diameter of the inner member, said outer member being open at both ends and having a flange at its front end against which the inner member abuts, a plug in the rear of the outer member abutting against and closing the rear end of the inner member, another plug closing the rear end of the outer member and spaced from the first mentioned plug, and loose refractory material filling the space between the

inner and outer members and between the plugs in the rear of said outer member.

10. An electric furnace muffle comprising a hollow, electrically-wired inner member of refractory material, as fire clay, an outer hollow member also of refractory material surrounding said inner member, and a metal jacket surrounding and closely fitting the sides, top and bottom of said outer member but exposing the opposite ends of the dome.

11. An electric furnace muffle comprising an inner member of non-conducting material, electrically-wired, an outer member also of non-conducting material surrounding said inner member, and contact posts inserted in and projecting from the exterior of said outer member, the opposite ends of the muffle wire being connected to these posts.

12. An electric furnace muffle comprising a hollow, electrically wired inner member open at both ends, a hollow outer member longer than the inner member, said outer member being open at both ends and formed with a flange at its front end, and a plug or plugs fitting in the rear end of the outer member for closing the rear end of the inner member and holding the same in place, a thermo-couple passing through and being connected to said plug or plugs.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN F. HAMMOND
RALPH B. SAVIN.

Witnesses:

MARY M'CALLA,
HERMAN K. GOSLIN.