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ELECTRIC HEATER FOR HEATING COMPRESSED AIR

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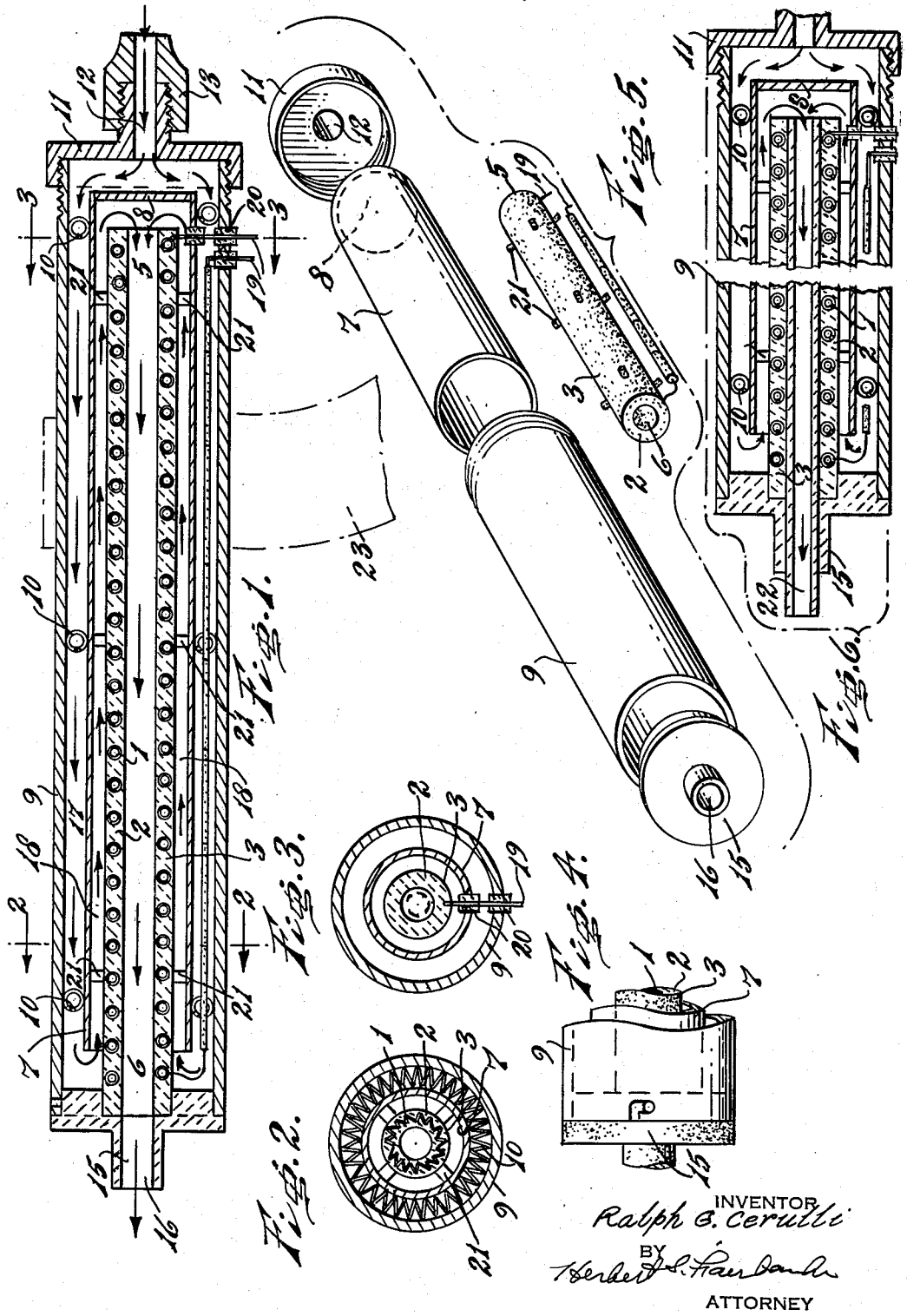


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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ELECTRIC HEATER FOR HEATING COMPRESSED AIR

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The object of this invention is to devise a novel compressed air heating unit having a minimum of heat loss and a maximum efficiency.

A further object is to devise a novel heating core and novel means to cause compressed air or inert gas to pass forwardly and rearwardly along and through the core.

With the foregoing and other objects in view as will hereinafter clearly appear, my invention comprehends a novel compressed air electric heating unit.

For the purpose of illustrating the invention, I have shown in the accompanying drawings a preferred form of the invention which I have found to give satisfactory results. It is, however, to be understood that the various instrumentalities of which the invention consists can be variously arranged and organized, and the invention is not limited, except by the scope of the appended claim, to the exact arrangement and organization of these instrumentalities, as herein set forth.

FIGURE 1 is a sectional elevation of a compressed air electric heating unit embodying my invention.

FIGURE 2 is a section on line 2—2 of FIGURE 1.

FIGURE 3 is a section on line 3—3 of FIGURE 1.

FIGURE 4 is a detail of the front end of the heating unit.

FIGURE 5 is an exploded view of certain parts of the heating unit.

FIGURE 6 is a sectional view of the heating unit with a tube inserted into the core to receive an article to be treated.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings:

An electrical resistance wire **1** of cylindrical formation is embedded in a mixture **2** of heat radiating cement consisting of a high temperature cement and a little water, so that when dry a tubular core **3** is formed. The core has an inlet **5**, a discharge outlet **6** and a longitudinal passage.

A tube **7** has its rear end closed at **8** and its front end open, and is contained within an outer cylinder **9** which may be stainless steel. Springs **10** between the tube and outer cylinder space the tube from the outer cylinder.

The inner end of the outer cylinder is closed by a closure **11** having an air inlet passage **12** and a coupling **13** to connect it to a source of air supply under pressure.

The discharge end of the outer cylinder is closed and sealed by a closure **15** having a discharge outlet **16** in longitudinal alignment with the passage in the core.

The air under pressure flows from the inlet through forwardly extending passage **17** between the outer cylinder and tube, then rearwardly through passage **18** between the tube and core and then forwardly through the core to the discharge outlet in the front closure.

The resistance wire **1** has its terminals **19** passing through an insulating bushing **20** and is adapted to be

connected with a source of electric supply of any desired voltage for which the unit is built.

The core has spacing lugs **21** on its outer periphery to space the core from the tube. The tube can be considered as floating between the outer cylinder and the core due to its mounting and is free to expand and contract longitudinally.

The front end of the core is centered and fixed in the outer closure **15** and the inner portion is free to expand or contract longitudinally.

The outer surface of the outer cylinder remains comparatively cool without insulation.

If desired, a tube **22** may be inserted in the core to receive articles to be treated, as shown in FIGURE 6.

The heating unit can be supported in any desired manner and in FIGURE 1 have shown a handle **23** schematically as applied to the outer cylinder.

In the operation, the air under pressure flows from the inlet between the tube and outer casing, then between the tube and core and is discharged at the outlet into contact with the articles or device to be highly heated. The entire core becomes intensively hot and temperatures at the discharge outlet of over fourteen hundred can be obtained.

The heating unit can be used for space heating, cooking, baking, annealing, welding and for many other purposes too numerous to mention in detail.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

A compressed air electric heating unit, comprising an open ended outer hollow cylinder, a closure secured to the rear end of said cylinder and having an air inlet, a closure secured to the front end of said hollow cylinder and having a discharge outlet, an inner hollow cylinder within the outer cylinder, open at its front end and closed at its rear end and spaced from the outer cylinder to form an annular passage communicating with the air inlet, and having its rear end spaced from the closure secured to the rear of the outer cylinder and having its front end spaced from the closure secured to the front end of the outer cylinder, coil springs between the inner and outer cylinders and spacing said cylinders from each other, an electrical resistance heating element embedded in cementitious material, and forming an open ended tubular core mounted within the inner cylinder, lugs spacing the tubular core from the inner cylinder to form an annular air passage, the rear end of the core being spaced from the closed rear end of the inner cylinder, and having its front end extending into the discharge outlet, and lead wires connected to opposite ends of said heating element and adapted to be connected with a source of electrical supply.

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