June 23, 1925. 1,542,967

M. H. SHOENBERG

ELECTRIC HEATER

Filed Nov. 19, 1923 2 Sheets-Sheet 1

FIG. 1.

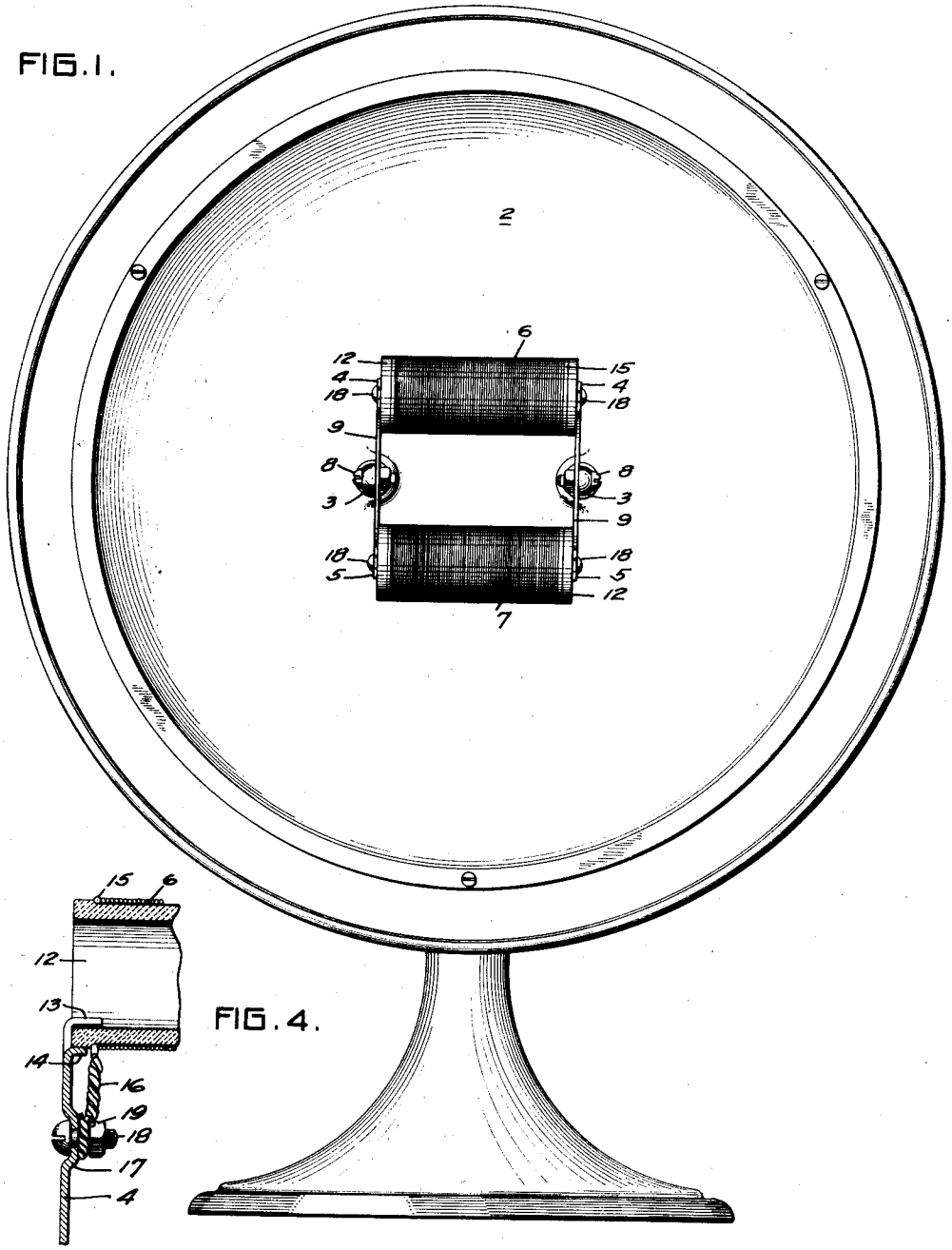






FIG. 4.

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FIG. 2.

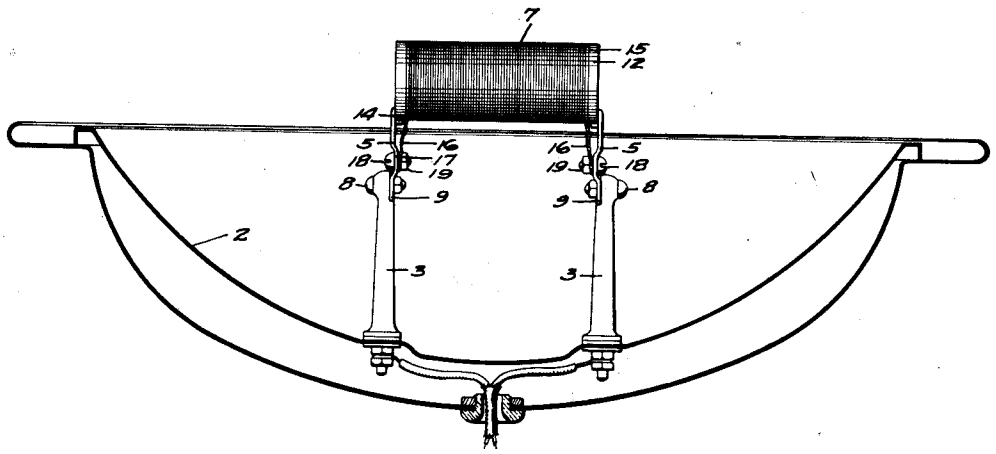
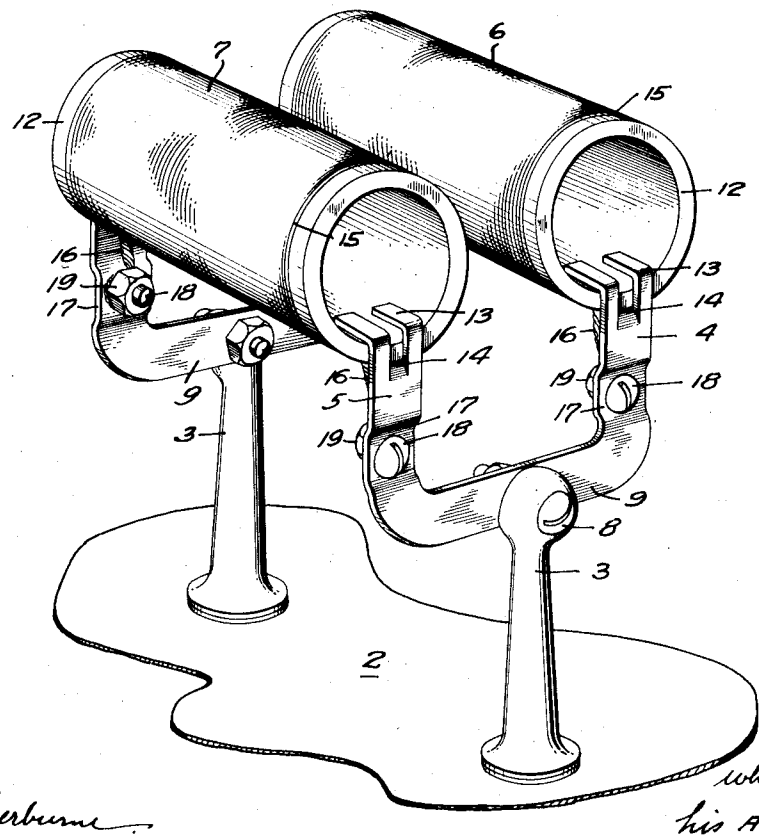



FIG. 3.




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Patented June 23, 1925. 1,542,967

# UNITED STATES PATENT OFFICE.

MILTON H. SHOENBERG, OF SAN FRANCISCO, CALIFORNIA.

## ELECTRIC HEATER.

Application filed November 19, 1923. Serial No. 675,540.

*To all whom it may concern:*

Be it known that I, MILTON H. SHOENBERG, a citizen of the United States, and a resident of the city and county of San Francisco, State of California, have invented a certain new and useful Electric Heater, of which the following is a specification.

The invention relates to electric heaters, and particularly to the means for supporting the heating element in position.

An object of the invention is to provide means for rigidly supporting one or more heating elements in fixed position.

Another object of the invention is to provide, in a radiant heater, a pair of supports for rigidly supporting a plurality of heating elements in fixed position.

A further object of the invention is to simplify and improve the heating element support, so that the positions of the heating elements with respect to the reflector, are fixed.

The invention possesses other advantageous features, some of which with the foregoing, will be set forth at length in the following description, where I shall outline in full, that form of my invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. In said drawings I have shown one form of device embodying my invention, but it is to be understood that I do not limit myself to such form, since the invention, as set forth in the claims, may be embodied in a plurality of forms.

Referring to the drawings:

Figure 1 is a front elevation of a radiant type heater embodying my invention.

Figure 2 is a cross section of the heater, taken on the line 2—2 of Figure 1.

Figure 3 is a perspective view of the heating elements and their supports.

Figure 4 is an elevation of the upper end of the heating element supporting means with a heating element supported thereby, the heating element being shown in section.

The present invention relates particularly to a radiant type heater in which one or more electric heating elements are arranged in front of, and preferably adjacent the focus of, a reflector, which may be spherical or parabolic or any other desired shape, to reflect the heat outwardly in a more or less concentrated beam. The present invention relates particularly to the means for supporting the heating elements in front of the reflector. The device comprises a reflector 2, of any desirable shape, which is usually arranged in a casing which is provided with a base, so that the heater may be arranged in variable positions on the floor. Extending thru and secured to the reflector, are two bifurcated metallic supports or standards 3, which are insulated from the reflector at their bases and which carry the cores on which the heating coils are wound. The supports 3 are substantially parallel to each other, and are spaced apart and the heating coils are supported by and arranged between, the supports. At their forward ends, the supports are bifurcated, forming two arms 4, 5, on each support, and the two heating elements 6, 7 are arranged between and supported by the corresponding arms of the two supports. The arms 4, 5, are preferably made in separate piece from the lower portions of the supports 3, said piece comprising the arms and the bridge 9, and this piece secured to the standard by suitable means, such as the bolt 8. The complete structure, embodying the standards and the arms, provides a bifurcated metallic support which is insulated from the reflector. The cores 12 on which the heating coils 6 and 7 are wound, are disposed between the corresponding ends of the arms on the two supports, that is, one core is supported between the arms 4 and the other core is supported between the arms 5. The cores 12 are preferably made of refractory material in the shape of a hollow cylinder, and the arms are provided on the ends with means for engaging the cores to rigidly hold them in position, thus fixing the heating elements with respect to the focus of the reflector. Each arm is provided on its end with three integral fingers which are bent to lie at a right angle to the arm. The upper fingers 13, extend into the hollow core 12 and the lower finger 14 engages the outer surface of the hollow core 12, so that the core is held in position between the fingers 13 and 14. The fingers engage the inner side of the hollow core, so that the core is disposed in front of the support. Wound on the cores are the heating coils 6 and 7 and means are provided for connecting one end of a coil with one support, and the other end of the coil, with the other support, the supports being connected, in back of the reflector, with the two sides of the electric supply circuit. To insure a good contact between the end of

the fine wire which forms the heating coil and the support, an auxiliary turn of heavy softer wire 15 is formed on both ends of each core and the ends of this turn 15 are twisted together with the end of the heating coil wire, thus forming a twisted pigtail 16, which is clamped to the support. To insure a good connection of the pigtail to the support, the arm is provided with an upset portion 17 thru which the clamping bolts 18, extend, and the pigtail is clamped between the nut 19 of the bolt and the upset portion 17 of the arm.

While I have shown the supports used in connection with a plurality of heating elements, it is to be understood that the arm and finger structure may also be used in connection with a single heating element.

By virtue of this construction, the two heating elements are rigidly and fixedly secured together and to the reflector, so that their positions with respect to each other and to the reflector, do not vary with the use of the heater. The heating elements are usually protected by a guard, not shown, which fits the periphery of the casing and is disposed in front of the heating elements.

I claim:

1. In an electric heater, a pair of bifurcated supports, and a pair of heating coils supported by said supports, each coil being carried by the two supports.

2. In an electric heater, a pair of bifurcated supports, the arms of the supports being disposed in spaced planes, and heating coils disposed in planes at right angles to the planes of the arms, carried by said supports.

3. In an electric heater, a pair of insulated bifurcated supports, and a plurality of heating coils disposed between, connected to and carried by said supports.

4. In an electric heater, a pair of insulated bifurcated supports, a plurality of cores disposed between and carried by said supports, a heating coil on each core and means connecting the ends of the coils to the supports.

5. In an electric heater, a pair of insulated bifurcated supports, spaced fingers in the ends of the arms of said supports and cores engaged by the fingers on the two supports.

6. In an electric heater, a pair of insulated bifurcated supports, spaced fingers formed in the ends of the arms of the supports, hollow cylindrical cores engaged and supported between the supports by said fingers and heating coils on said cores.

7. In an electric heater, a pair of insulated supports, a cross arm secured to each support, fingers on the ends of said cross arms, the fingers in the corresponding ends of the cross arms pointing toward each other and cores carried by said corresponding sets of fingers.

8. In an electric heater, a pair of insulated bifurcated supports, the arms of the supports being disposed in parallel spaced planes, a plurality of inturned fingers on the end of each arm, said fingers being spaced apart to form a groove therebetween, hollow cores having their ends disposed in the grooves formed by the fingers on the corresponding ends of the arms of the two supports, heating coils on said cores and means connecting the ends of the coils to the supports.

9. In an electric heater, a reflector, a pair of bifurcated supports carried by and disposed in front of the reflector and a pair of heating coils disposed between and carried by said supports.

10. In an electric heater, a reflector, a pair of bifurcated supports carried by and disposed in front of the reflector, core engaging fingers formed on the ends of the arms of said supports, cores engaging corresponding fingers on the arms of the two supports and heating coils on said cores.

11. In an electric heater, a reflector, a pair of spaced heating coils arranged in front of said reflector and a pair of bifurcated supports on which said coils are rigidly supported.

12. In an electric heater, a reflector, a pair of spaced parallel cores arranged in front of and adjacent the focus of said reflector, a pair of bifurcated supports on which said cores are rigidly mounted and heating coils on said cores.

13. In an electric heater, a pair of spaced supports, inturned fingers on the ends of the supports, a core engaging said fingers and a heating coil on said core.

14. In an electric heater, a pair of insulated spaced supports, inturned fingers on the ends of said supports, a core disposed between said supports and held by said fingers, a heating coil on said core and means connecting the coil with said supports.

15. In an electric heater, a bifurcated support and a plurality of heating coils supported by and separately connected to said support.

16. In an electric heater, a pair of bifurcated supports and a plurality of heating coils disposed between, separately connected to and carried by said supports.

In testimony whereof, I have hereunto set my hand.

MILTON H. SHOENBERG.