

C. C. POWERS.  
ELECTRICAL HEATER,  
APPLICATION FILED JAN. 25, 1918.

1,273,666.

Patented July 23, 1918.

2 SHEETS—SHEET 1.

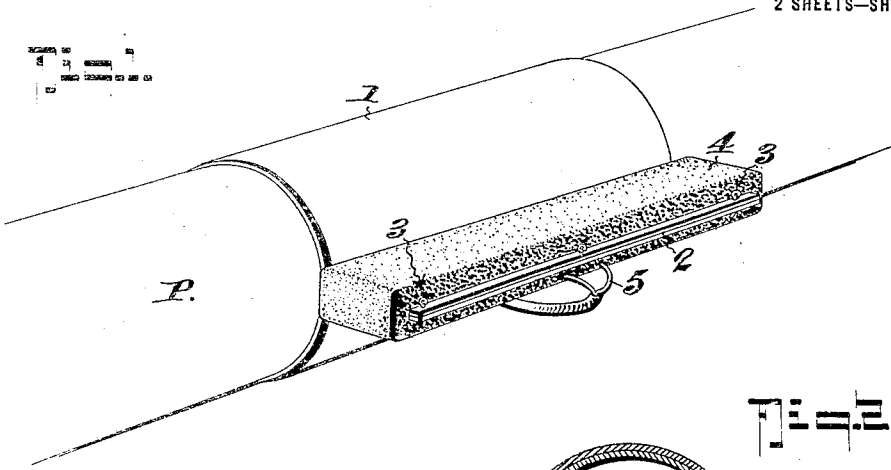
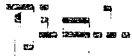


Fig. 1.

Fig. 2.

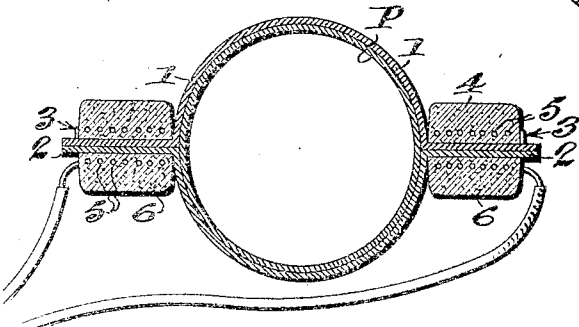
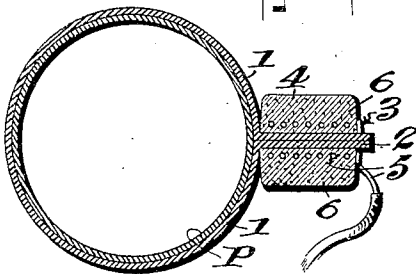


Fig. 3.

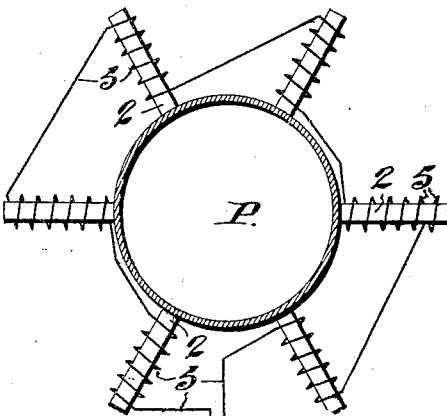
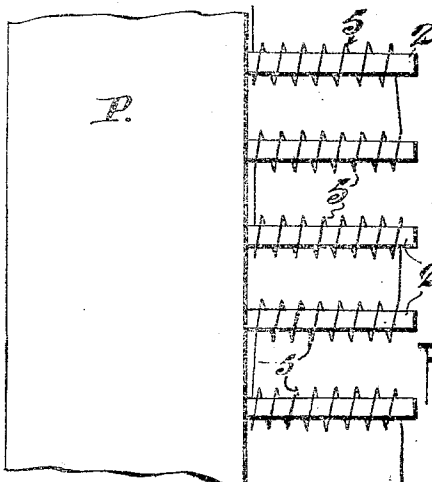


Fig. 4.



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INVENTOR

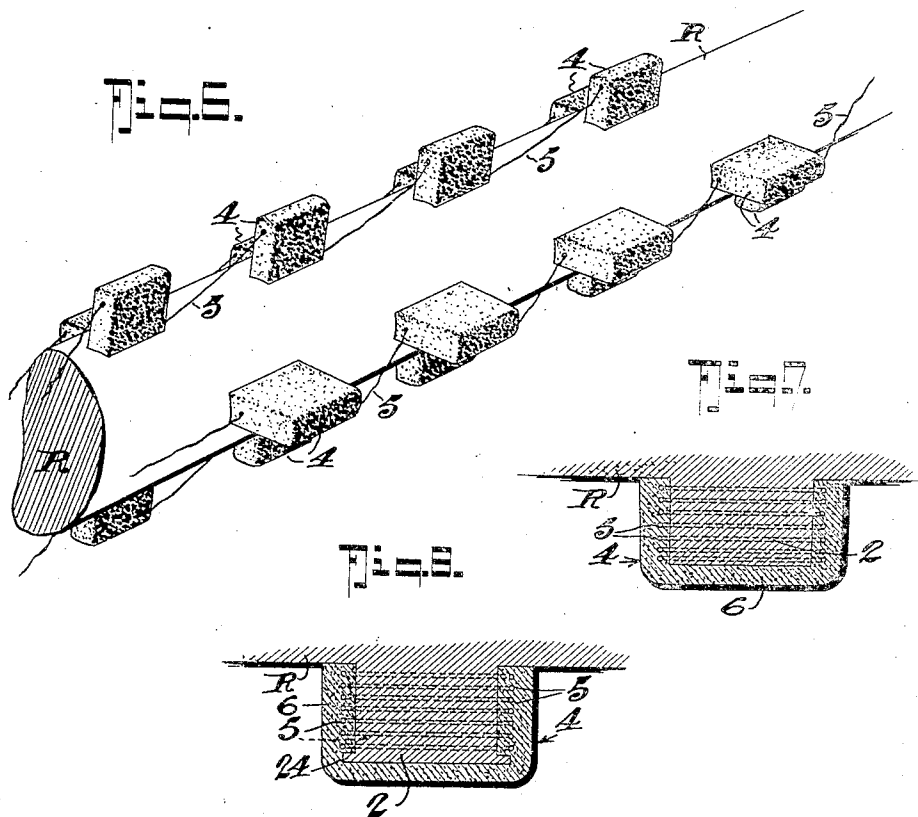
Charles C. Powers

BY  
Fred G. Gutierrez  
ATTORNEYS

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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

CHARLES C. POWERS, OF WILLIAMS, ARIZONA.

## ELECTRICAL HEATER.

1,273,666.

Specification of Letters Patent.

Patented July 23, 1918.

Application filed January 25, 1918. Serial No. 312,653.

*To all whom it may concern:*

Be it known that I, CHARLES C. POWERS, a citizen of the United States, residing at Williams, in the county of Coconino and State of Arizona, have invented certain new and useful Improvements in Electrical Heaters, of which the following is a specification.

My invention relates to certain new and useful improvements in the art of electric heating and it primarily has for its object to provide a convenient and inexpensive way for applying electrically generated heat to air circulating pipes (such as furnace pipes or carbureter manifold pipes, or other tubular structures) and for applying heat to rods or other solid bodies.

Generically, the invention consists in providing a heat conducting body having radial fins, lugs or projections on which a heating coil of wire is wound and preferably embedded in a heat insulating electrically non-conducting substance such as cement, bakelite, fire-clay or other suitable composition.

The heat is applied to the fins, which may be either directly formed on the body to be ultimately heated, or formed as ears on bands that are strapped around or embrace the pipe or body which it is desired to heat.

The invention also includes those novel details of construction, combination and arrangement of parts, all of which will be first fully described, then be specifically pointed out in the appended claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view showing one form of the invention as applied to heating furnace pipes or other air ducts.

Fig. 2 is a cross section of the same.

Fig. 3 is a modification of the invention showing how the split band may be made in two parts, instead of one, as shown in Fig. 2.

Fig. 4 is a plan view of a modification in which the pipe has rod-like projections instead of flat elongated fins.

Fig. 5 is a cross section of a modification of the construction shown in Fig. 4, in which the lugs or projections are arranged radially around the pipe at intervals.

Fig. 6 is a perspective view showing the invention applied for heating rods.

Fig. 7 is a detail section showing how the heating coil may be slipped on over the fin.

Fig. 8 is a view similar to Fig. 7 showing how the heating coil may be permanently mounted on the fin.

In the drawings, in which like letters and numerals of reference indicate like parts in all of the figures, P represents the pipe which it is desired to heat. If used with furnace pipes, I prefer to provide a band 1, the ends 2 of which are brought together and extended radially to form a fin on which the heating unit 4 is located. The heating unit consists of a coil 5 of wire, preferably wound in a single layer and embedded in an electrically insulated and preferably heat insulating body 6, the thickness of which is preferably of very small degree adjacent to the fin 2 and of greater degree at the exposed sides so as to concentrate the heat application onto the fin. The heating units 4 may be separately built up and slipped onto the fin 2 and retained by cotter pins 3, or otherwise, as may be found convenient, or they may be tightly slipped onto the fin, as shown in Fig. 7, or they may be wound on the fin, as shown in Fig. 8, in a permanent manner, as will be later explained.

Instead of forming the band in a single loop, it may be made in sections, as shown in Fig. 3, in which event a plurality of fins are provided to receive a plurality of heat units.

Instead of providing the fins 2 of flat elongated structure, they may be made as indicated in Figs. 4 and 5, as small rod-like projections on which the coils are located, as diagrammatically indicated in Figs. 4 and 5.

When it is desired to utilize the invention for heating rods which are used as heat conductors, the arrangement shown in Fig. 6 may be employed, and the coil receiving lugs 2 may be formed integrally with the rod or secured thereto in any desired way.

When the heating unit 4 is to be a permanent structure, the lugs or fins 2 may have shoulders 24 embedded in the insulation of the heat unit to retain such unit in place.

It will be observed that by my method of heat application, a very large amount of heating wire can be used within a relatively confined space and each unit is preferably wound with but a single layer of heating

wire; the layer can be laid close to the part to which the heat is to be applied and hence a greater efficiency of heat application may be produced than in those cases where the heating coil consists of a plurality of layers some of which must, of necessity, be remote from the point of heat concentration.

The coils 5 themselves may be made of insulated wire or when bare wire is used, they are wound spaced apart and embedded in an insulating composition in such manner as to prevent short-circuiting.

While I have shown numerous modifications of my invention, it is obvious that others may be made without departing from the invention or the scope of the appended claims and I desire it to be understood that I do not limit myself to the specific use of my ideas illustrated but desire it understood that the invention may be used wherever it may be found adaptable.

From the foregoing description, taken in connection with the accompanying drawings, it is thought the complete construction, operation and advantages of the invention will be readily understood by those skilled in the art.

What I claim is:—

1. The combination of a body embracing heat-conducting band having ends, said heat conducting band having its ends bent to lie together to form a fin, a heating coil wound

on said fin, means to hold said coil on said fin and thereby hold said band ends together.

2. The combination of a body embracing heat-conducting band having ends, said heat conducting band having its ends bent to lie together to form a fin, a heating coil wound on said fin, means to hold said coil on said fin and thereby hold said band ends together, and a non-fusible body embedding the coil.

3. The combination of a body embracing heat-conducting band having ends, said heat conducting band having its ends bent to lie together to form a fin, a heating coil wound on said fin, and a non-fusible body embedding the coil.

4. A body having a radial heat conductive projection, a heating coil wound on said projection and electrically insulated from the same, said coil being located in close proximity to the projection, a thin electrically insulated non-fusible covering over said projection on which said coil is wound, and a heat insulating electrical non-conducting non-fusible covering over said coil and projection and of considerably greater thickness than the insulating covering between the coil and the projection, whereby the heat of the coil will be concentrated on the projection, all being arranged substantially as shown and for the purposes described.

CHARLES C. POWERS.