F. KUHN.

ELECTRICAL HEATING UNIT.

APPLICATION FILED JUNE 28, 1913.

1,170,166. Patented Feb. 1, 1916.

Fig. 1.

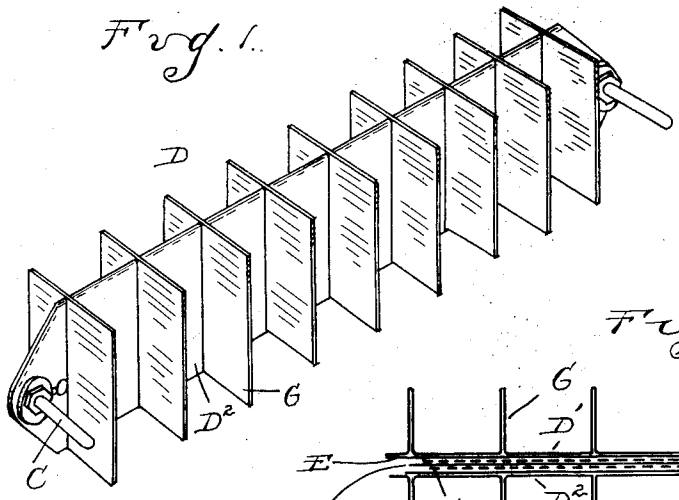


Fig. 2.

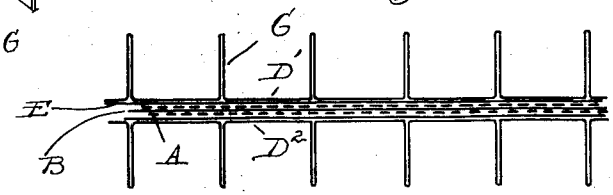
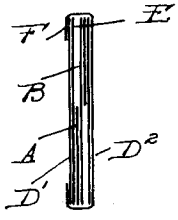


Fig. 3.



Witnesses
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UNITED STATES PATENT OFFICE.

FRANK KUHN, OF DETROIT, MICHIGAN.

ELECTRICAL HEATING UNIT.

1,170,166. Specification of Letters Patent. Patented Feb. 1, 1916.

Application filed June 28, 1913. Serial No. 776,255.

To all whom it may concern:

Be it known that I, FRANK KUHN, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electrical Heating Units, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to electrical heating units and is more particularly designed for use in air heaters.

It is the primary object of the invention to provide sufficient means for dissipating the heat or communicating the same to the air and which will avoid high temperature in the heating element.

To this end the invention comprises the construction as hereinafter set forth.

In the drawings: Figure 1 is a perspective view of the element; Fig. 2 is a longitudinal section therethrough; and Fig. 3 is a cross section.

In the construction of electrical heating units, it is desirable to incase the resistor in an armor serving the double purpose of protection against short circuit and mechanical stresses, and also a means for uniformly distributing the heat. Where it is desired to produce radiant heat—as, for instance, in broilers, toasters, etc.,—a higher temperature is required in the heat-distributing surface than for the heating of liquids or gases. It is, however, desirable in the construction of air heaters to limit the size of the apparatus, and it is difficult to produce the desired efficiency without raising the temperature of the heat-distributing surface to a higher point than desirable. With my improved construction I obtain the desired result by greatly increasing the extent of the heat-distributing surface without materially increasing the space limits within which the unit is confined. I further obtain this increased heating surface, preferably by forming it as an integral part of the armor which protects the unit, so as to secure the best heat conduction.

In detail, A is the heating resistor, which, as shown, is wound upon a flat insulated core member B and has its opposite ends attached to terminal contact pins C.

D is a metallic armor for incasing the resistor, being insulated therefrom by interposed sheets of insulation E, of mica or other suitable material. The armor is formed of flat strips of metal lying adjacent to the insulated resistor and having their edges secured by crimping over, as at F, or in any other suitable seam connection.

To increase the extent of heat-radiating surface, each of the opposite plates D′ and D^2 of the armor is crimped or folded to form outwardly-extending, integral return-bent flanges G, which, as shown, extend perpendicular to the plane of the unit. These flanges, being continuous with the portions of the armor in direct contact with the heat generator, will rapidly conduct the heat outward, and the extended surface in conjunction with the directly heated surface will dissipate the heat or communicate it to a larger volume of air than would be possible with a plain armored surface.

The unit constructed as described may be arranged in any convenient manner within a supporting frame or housing, and will divide the space therein into a large number of air passages in proximity to the heating surface.

What I claim as my invention is:

An electrical heating unit, comprising a comparatively flat insulated resistor extending longitudinally in a plane and a comparatively flat, longitudinally extending armor, incasing said resistor, said armor having portions lying in planes parallel to the resistor and in heat conducting contact with the flat face thereof and being also provided with integrally formed outward extensions positioned crosswise to the plane of the resistor and extending at substantially right angles thereto, said outward extensions being distributed along the length of said resistor to form heat distributing surfaces.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK KUHN.

Witnesses:
JAMES P. BARRY,
HENRI E. BOWMAN.