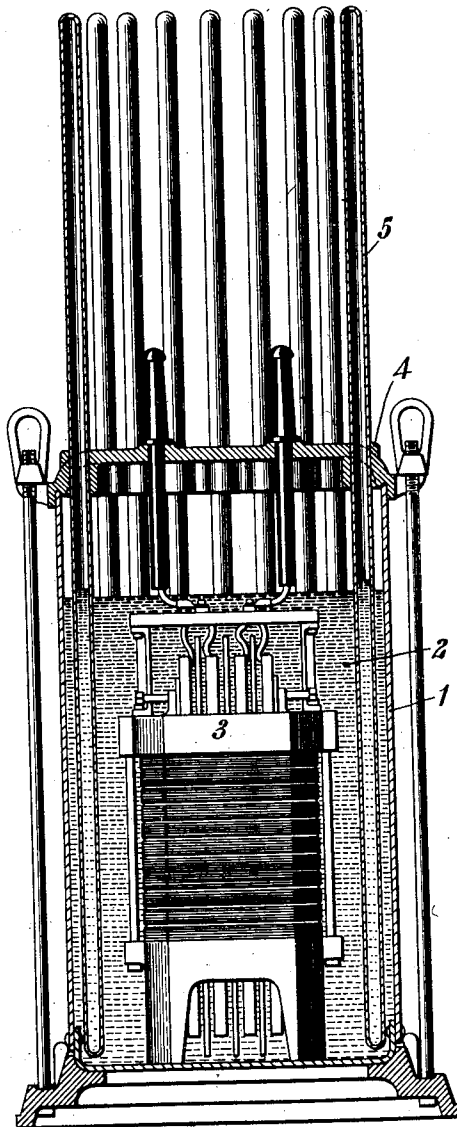


No. 854,278.

PATENTED MAY 21, 1907.

F. DARLINGTON.
RADIATOR.

APPLICATION FILED JUNE 25, 1906.



WITNESSES:

C. L. Bulcher
Otto S. Schairer

INVENTOR

Frederick Darlington

BY

Wesley S. Carr
ATTORNEY

UNITED STATES PATENT OFFICE.

FREDERICK DARLINGTON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

RADIATOR.

No. 854,278.

Specification of Letters Patent.

Patented May 21, 1907.

Application filed June 25, 1906. Serial No. 323,367.

To all whom it may concern:

Be it known that I, FREDERICK DARLINGTON, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Radiators, of which the following is a specification.

My invention relates to radiators, and particularly to such as are employed in connection with transformers and other electrical translating devices for the purpose of dissipating the heat that is generated during the operation thereof, and it has for its object to provide simple and exceptionally efficient means of the character indicated.

The sizes and proportions of electrical transformers and other translating devices depend largely upon the rate at which heat generated thereby may be dissipated, because it is essential to the preservation of the insulating material employed in the construction thereof that the temperature be maintained at less than a certain degree. In order to facilitate the dissipation of heat, electrical translating devices are frequently submerged in an insulating liquid, such as oil, which is cooled, either by providing large superficial areas for the receptacles, or by means of systems of coiled tubing in which water is circulated, the latter means being usually employed when it is desired to cause dissipation of the heat at a greater rate than is possible with the former means. In certain locations, however, water is either so expensive or unavailable as to render the use of cooling coils impracticable, and I accordingly propose to partially submerge a plurality of hermetically sealed tubes or other receptacles in the oil or insulating liquid, the tubes containing an easily volatilized liquid, such as ether or alcohol, of approximately the same depth as the insulating liquid.

In operation, the heat of the insulating liquid is conveyed to the volatile liquid within the tubes which vaporizes and rises into the unfilled portions of the tubes, carrying with it heat in latent form. The vapors are condensed in the upper portions of the tubes, the latent heat of evaporation being thus given off, and the condensed vapors in the form of liquid return to the lower portions of the tubes.

The single figure of the accompanying drawing is a longitudinal sectional view of a transformer that embodies my invention.

Contained within a suitable receptacle 1 is oil or some other suitable insulating liquid 2 in which a transformer 3 is submerged. Projecting through a cover 4 for the receptacle 1 and into the insulating fluid 2 are a plurality of pipes or tubes 5, the ends of which are hermetically sealed and the submerged lower ends of which are filled with alcohol, ether or some other suitable liquid that is more readily volatilized than the insulating liquid 1. The volatile liquid absorbs heat from the insulating liquid and is volatilized, the heat being converted into the latent form by evaporation of the volatile liquid.

The vapors rise into the upper portions of the tubes, are condensed and return to the lower portions of the tubes in the form of a liquid, the latent heat of evaporation being given up upon condensation.

While the invention has been shown and described as employed in connection with an electrical transformer, it will be readily understood that it may also be employed as a radiator in connection with other devices, and that the structural details and arrangement of the parts may be considerably varied from what has been shown without departing from the spirit of the invention.

I claim as my invention:

1. The combination with a heated liquid, of one or more sealed receptacles that project into the same and contain a liquid that is more volatile than the aforesaid liquid.

2. The combination with a heated liquid, of one or more sealed receptacles that project into the same and are partially filled with a liquid that is more volatile than the aforesaid liquid.

3. The combination with a heated liquid, of one or more sealed receptacles that project into the same and the submerged portions of which are filled with a liquid that is more volatile than the aforesaid liquid.

4. The combination with a heat-containing device, of one or more sealed receptacles that project thereinto and contain a volatile liquid.

5. The combination with a heat-containing device, of one or more sealed receptacles

that project thereinto and are partially filled with a volatile liquid.

6. The combination with a receptacle, an electrical device located therein, and a liquid in which the receptacle is submerged, of one
5 or more sealed receptacles that are partially submerged in the aforesaid liquid and contain another and more volatile liquid.

7. The combination with a receptacle, an
10 electrical device located therein, and a liquid in which the device is submerged, of one or more sealed receptacles that are partially submerged in the aforesaid liquid, and the

submerged portions of which contain another and more volatile liquid.

8. The combination with a heated substance, of one or more sealed receptacles that project into the same and contain a volatile liquid. 15

In testimony whereof, I have hereunto
20 subscribed my name this 15th day of June, 1906.

FREDERICK DARLINGTON.

Witnesses:

OTTO S. SCHAIRER,
BIRNEY HINES.