

No. 886,073.

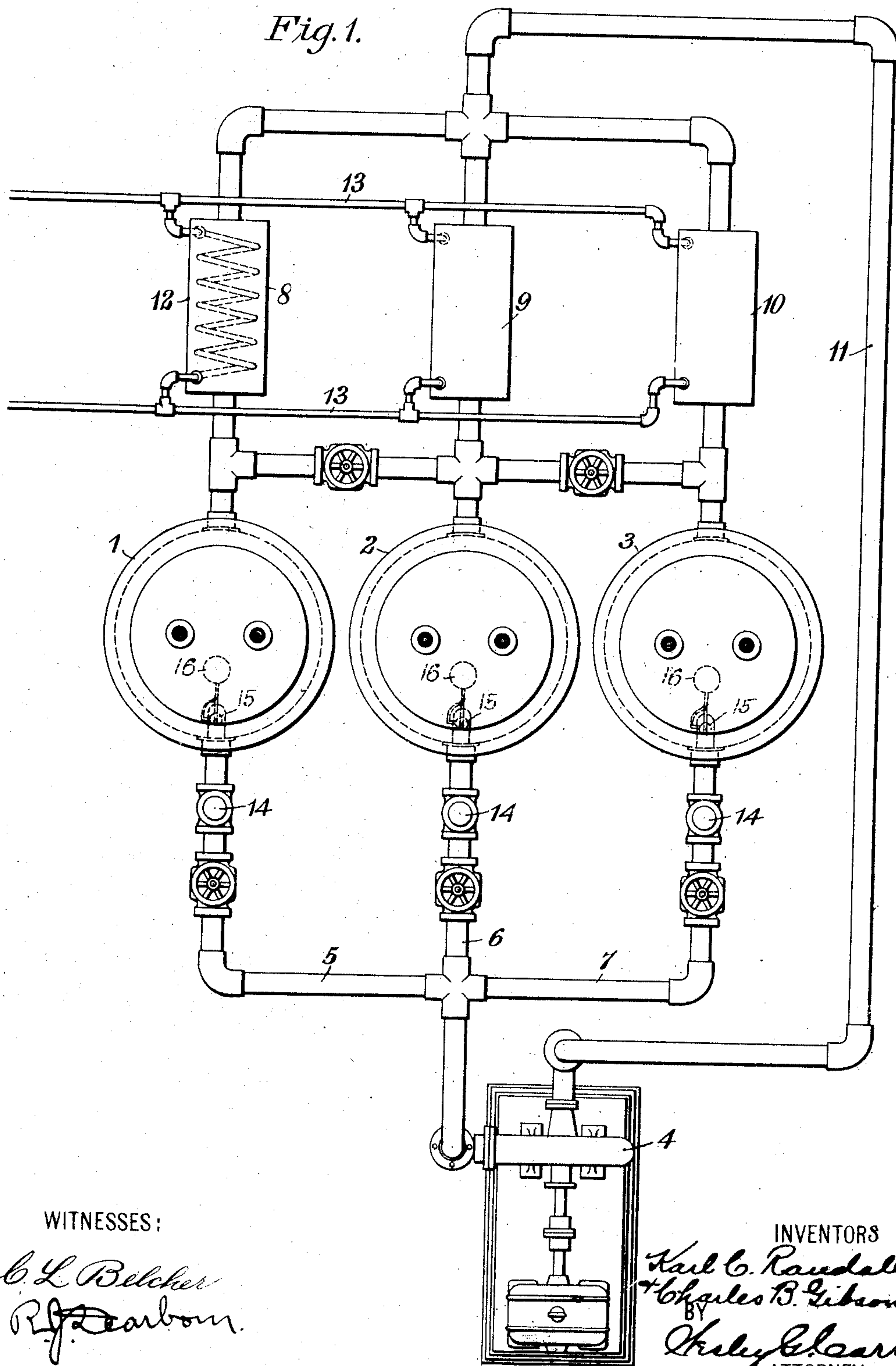
PATENTED APR. 28, 1908.

K. C. RANDALL & C. B. GIBSON.
COOLING SYSTEM FOR ELECTRIC APPARATUS.

APPLICATION FILED AUG. 3, 1907.

2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

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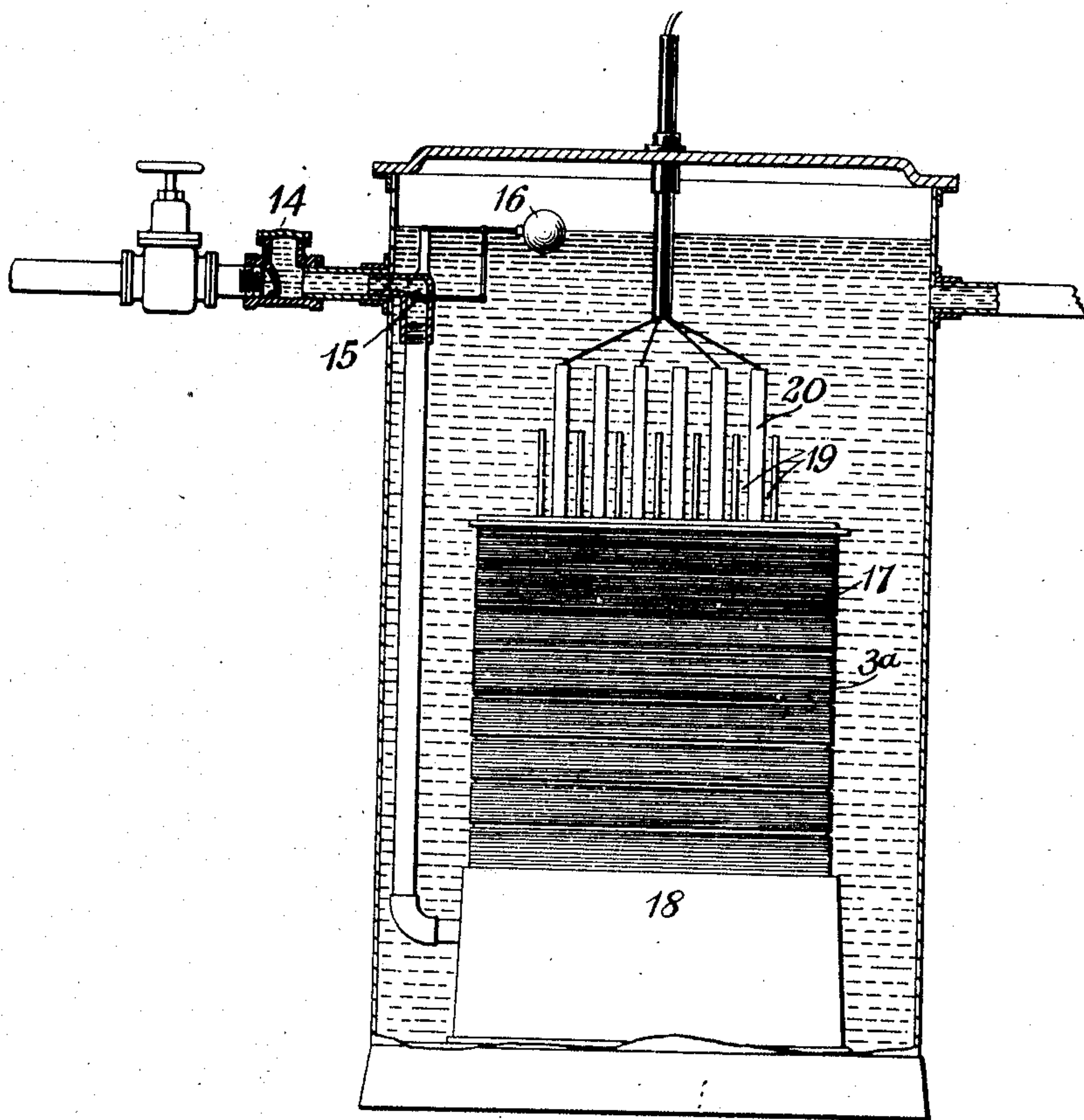
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

KARL C. RANDALL, OF EDGEWOOD PARK, AND CHARLES B. GIBSON, OF WILKINSBURG, PENNSYLVANIA, ASSIGNORS TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

COOLING SYSTEM FOR ELECTRIC APPARATUS.

No. 886,073.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed August 3, 1907. Serial No. 386,915.

To all whom it may concern:

Be it known that we, KARL C. RANDALL and CHARLES B. GIBSON, citizens of the United States, and residents, respectively, of Edgewood Park and Wilkinsburg, both in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Cooling Systems for Electric Apparatus, of which the following is a specification.

Our invention relates to cooling systems for electrical apparatus and it has for its object to provide improved means for regulating the circulation of insulating fluid through a plurality of tanks or cases which are connected in multiple and in which transformers or other electrical devices are contained.

Three or more large electrical transformers are frequently in close proximity to each other in power plants and stations and it is often desirable to provide for the circulation of insulating fluid through their containing tanks. This result has heretofore been accomplished by providing a plurality of separate cooling systems each of which comprised a motor and a fluid pump, but, in such cases, an unnecessary expense was involved by reason of the multiplicity of auxiliary apparatus.

In order that a plurality of transformer tanks may be supplied with insulating fluid from a single source, it is necessary to provide means for automatically regulating the circulation through the casing of each transformer so as to avoid the possibility of one of the tanks being over supplied, while one or more of the other tanks which are connected in multiple with it, are supplied with an insufficient quantity of cooling fluid.

The aforesaid objective results are accomplished in the system of our present invention, a convenient embodiment of which is illustrated in the accompanying drawings.

Figure 1 is a diagrammatic plan view which shows the relative position of the apparatus embodied in the system and Fig. 2 is an elevation of a single transformer, the casing of which is partially broken away to disclose the inlet port and the valve-regulating means which are representative of those employed in each of the tanks illustrated in Fig. 1.

Referring to the drawings, tanks or casings, 1, 2, and 3, in which transformers 3^a or

other electric apparatus may be disposed, are supplied with insulating and cooling fluid by a single pump 4 through pipes 5, 6, and 7. A circulation of the liquid is maintained by the pump, the tanks being connected, through a plurality of cooling chambers 8, 9, and 10, to a common return pipe 11 from which the pump is supplied. Each of the cooling chambers comprises a tank or casing 12 in which cooling pipes of helical form may be located, said pipes being supplied with a continuous circulation of cooling fluid, such as water or air, by means of supply and discharge pipes 13. In order to prevent a reversal of direction of flow through the transformer tanks, check valves 14 are located in the supply pipes.

The core member 17 of the transformer is supported upon a hollow base 18 which rests on the bottom of the tank and the inlet pipe is extended, after it enters the tank near the top, in order to supply cooling fluid directly to the chamber formed by the hollow vase. From this chamber the fluid is forced through spaces 19 between the coils 20 and, consequently, serves to carry away the heat generated therein.

The quantity of insulating fluid which is admitted to each transformer tank is automatically regulated by a throttle valve 15 which is governed by a float 16, the arrangement of parts being such that as the level of the liquid in the tank rises above or falls below predetermined values, the valve is automatically adjusted to control the amount of liquid admitted.

We claim as our invention:

1. The combination with electrical apparatus, fluid containing tanks therefor, cooling chambers, and means for maintaining a circulation of cooling fluid through the tanks, of means for keeping the fluid at substantially the same level in all the tanks.

2. The combination with a plurality of electric transformers, fluid-containing tanks therefor, cooling chambers and means for maintaining a circulation of insulating fluid through the tanks and the chambers, a throttle valve in the supply line of each tank and means for automatically controlling the throttle valve.

3. The combination with a plurality of

electric transformers, fluid-containing tanks therefor, cooling chambers and means for maintaining the circulation of insulating fluid through the tanks and the chambers, of
5 a throttle valve in the supply line of each tank and floats for controlling the openings of the valves.

In testimony whereof, we have hereunto

subscribed our names this 31st day of July, 1907.

KARL C. RANDALL.
CHARLES B. GIBSON.

Witnesses:

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