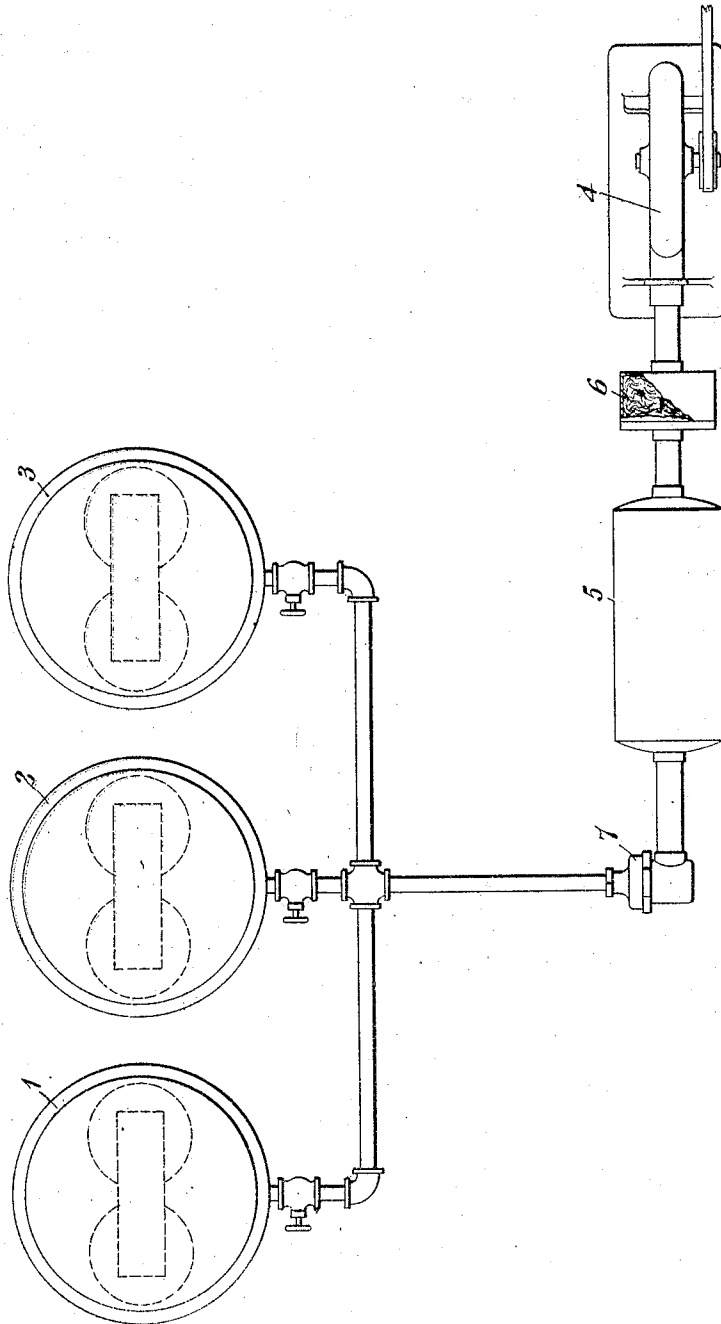


K. C. RANDALL.
ELECTRICAL APPARATUS.
APPLICATION FILED JULY 28, 1909.

999,870.

Patented Aug. 8, 1911.



WITNESSES:

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ELECTRICAL APPARATUS.

999,870.

Specification of Letters Patent.

Patented Aug. 8, 1911.

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To all whom it may concern:

Be it known that I, KARL C. RANDALL, a citizen of the United States, and a resident of Edgewood Park, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electrical Apparatus, of which the following is a specification.

My invention relates to electrical apparatus, and it has special reference to transformers and other devices which are provided with inclosing tanks or casings wholly or partially filled with air or other fluids.

The object of my invention is to provide means for preventing a condensation of moisture within the casings of devices of the class above indicated that shall be simple and inexpensive in construction and efficient in operation.

When transformers and other electrical devices are inclosed in tanks and are located in the open air, changes in the outside temperature, relative to the temperature within, will frequently cause a so called "breathing action," which term is ordinarily applied to such a transfer of air from outside to inside as causes a condensation of moisture on the transformer coils and on the inside of the casing. Even though the air which is within the transformer casing is ordinarily perfectly dry, the increase of temperature within causes air to be forced out of the casing and, as the transformer assumes a lower temperature, outside air charged with moisture will enter the casing. As this process is repeated, a material amount of moisture will accumulate and endanger the insulation of the apparatus, particularly if it is used in high potential service.

According to my present invention, I provide means for holding the air within the transformer casing at a pressure which is slightly greater than that of the outside atmosphere in order that any flow of air may be outward instead of inward. In order to compensate for any small leak in the transformer casing, a constant supply of air is maintained.

The single figure of the accompanying drawing is a diagrammatic plan view of a plurality of transformers, the tanks of which are connected to the pressure-producing apparatus of my invention.

Referring to the drawings, transformers or other electrical apparatus are disposed

within the casings 1, 2, and 3 which may be filled with air or partially filled with liquid insulation, a slight pressure being maintained within the casing by means of a pump or blower 4. This pump produces a relatively high pressure within a storage tank or reservoir 5 which is supplied from the outside atmosphere through a chamber 6 containing hygroscopic material, the pressure being cut down by a reducing valve 7 before it enters the transformer casings.

The storage reservoir may be omitted but it will ordinarily be found desirable, in order to avoid the necessity of operating the pump continuously. For example, if the transformer tanks are practically free from leaks, an auxiliary reservoir may be filled with dry air, or some other suitable fluid, by operating a pump for a relatively short time, and several days may then elapse before it is necessary to again operate the pump.

By maintaining a relatively low pressure in a large storage tank, the reducing valve may be omitted.

A relatively small pump will serve to supply the necessary pressure to a large number of transformers having sealed tanks, since the pressure of a few ounces will usually be found sufficient to prevent the "breathing action."

I do not wish to be limited to the use of dry air for preventing moisture from gathering on the transformer windings, since any suitable insulating dehydrated fluid or combination of fluids may be employed.

I claim as my invention:

1. The combination with electrical apparatus and an inclosing casing therefor, of means for continuously supplying dehydrated fluid to the casing to maintain an outward pressure slightly greater than that of the atmosphere.

2. The combination with electric apparatus and an inclosing casing therefor, of a relatively high-pressure storage reservoir, a pump for supplying dry air thereto, and means for supplying dry air from the storage reservoir to the casing at a reduced pressure.

3. The combination with an electric transformer and an inclosing casing therefor, of a relatively high-pressure storage reservoir, a chamber containing hygroscopic material, a reducing valve between the inclosing cas-

ing and the storage reservoir, and means
for forcing the air through the hygroscopic
material into the storage reservoir from
which it is discharged at relatively low
5 pressure into the casing.

4. The combination with an electric trans-
former and an inclosing casing therefor, of
a storage reservoir, a chamber containing
hygroscopic material, and a pump for forc-
10 ing insulating fluid through the chamber

containing the hygroscopic material into
the reservoir, dry air from the reservoir
being continuously supplied to the casing.

In testimony whereof, I have hereunto
subscribed my name this 21st day of July, 1909.

KARL C. RANDALL.

Witnesses:

HELEN BUXTON,
B. B. HINES.