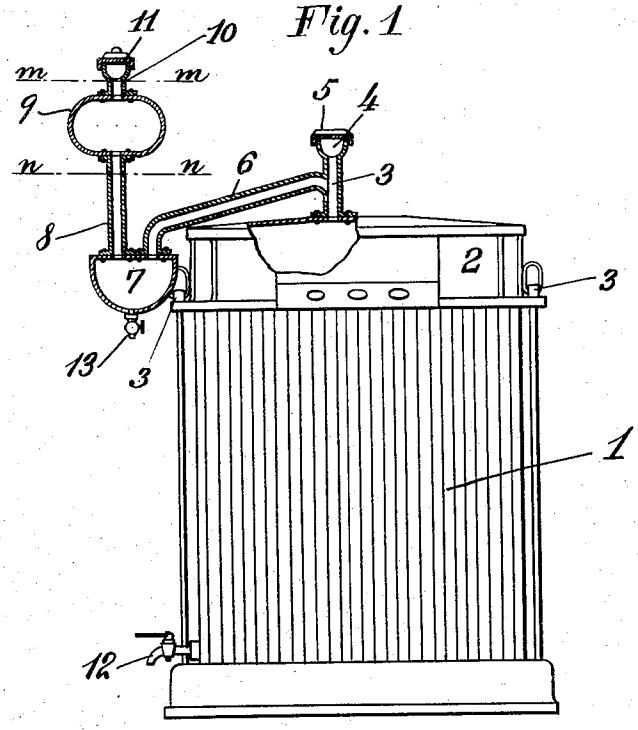
O. KULKA.

OIL COOLED TRANSFORMER.

APPLICATION FILED SEPT. 21, 1910.

1,002,527. Patented Sept. 5, 1911.

Fig. 1



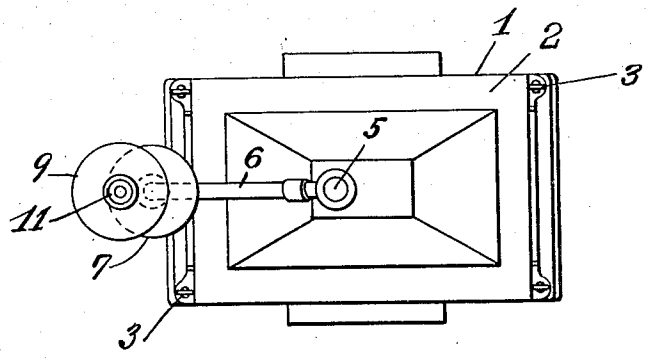


Fig. 2

Witnesses:
A. F. Schneider
Peter A Roe

Inventor
Otto Kulka,
By his Attorneys
Edwards, Sager & Wooster.

UNITED STATES PATENT OFFICE.

OTTO KULKA, OF HAMBURG, GERMANY, ASSIGNOR TO CARL FRANZ SANDER, OF HAMBURG, GERMANY.

OIL-COOLED TRANSFORMER.

1,002,527. Specification of Letters Patent. Patented Sept. 5, 1911.

Application filed September 21, 1910. Serial No. 583,019.

To all whom it may concern:

Be it known that I, OTTO KULKA, a subject of the Emperor of Austria-Hungary, residing at Hamburg, in the Empire of Germany, have invented certain new and useful Improvements in Oil-Cooled Transformers, of which the following is a full, clear, and exact specification.

This invention relates to oil cooled transformers, and more particularly has reference to improvements in transformer casings whereby the transformer case can always be maintained full of oil and the oil in the casing will be kept free of water.

It is desirable to maintain the level of the oil in the casing at all times above the core and windings of the transformer, and also to keep the oil free of moisture. As the oil is subject to considerable expansion and contraction by reason of changes in temperature, and is open to the air to give vent to the gases etc., it may absorb considerable moisture.

According to this invention, I propose to seal the top of a transformer case with an oil tight cover and to provide in combination with the transformer casing a siphon-like passage having a reservoir for receiving without loss by overflow the excess of oil, when heated, together with a water chamber in which the water can be trapped and drawn off without going into the transformer casing.

The invention will be more fully understood in connection with the description of the accompanying drawing, wherein—

Figure 1 represents an elevation of a transformer casing provided with the invention, a portion thereof being in section. Fig. 2 is a plan view.

1 represents a transformer casing of usual design having a cover 2 which may be fastened thereon by clamps 3, and suitable means to prevent leakage of oil. At the top of the casing cover 2 is provided an upright pipe 3 having a vent chamber 4 closed by a cap 5, and leading from the pipe 3 is a downwardly inclined pipe 6 leading to chamber 7, which is preferably below the top of the cover 2, and of course below the level of oil in the casing. From the chamber 7 leads an upright pipe 8 having an overflow reservoir 9 therein, together with a pipe 10 and a closure cap 11.

12 is a cock for drawing off the oil from the casing in case it may be necessary, and 13 is a cock at the bottom of the settling chamber 7 for drawing off water or solids which may get into the oil and settle to the bottom of chamber 7.

In operation, the cap 5 is removed to fill the transformer case, the pipes 3, 6 and 8, and chamber 7 with oil, up to the level of the line *n—n*, Fig. 1, it being understood that the cap 11 is also removed. Having filled the casing with oil, the cap 5 is replaced and locked gas tight and the cap 11 is left slightly open, so that air and gases can pass where necessary either by variation in the volume of the oil or by liberation of gases from the oil. It will be seen that any moisture which is drawn or formed in the overflow chamber 9 will settle through the pipe 8 to the bottom of chamber 7, adjacent to cock 13, and will not pass upward through pipe 6 into the interior of the casing. When the oil becomes very much heated it may rise to the line *m—m* in Fig. 1, it being seen that the reservoir 9 is given considerable volume so as to take care of a large quantity of oil without causing overflow through the pipe 10. It will be seen that the transformer will always be covered with oil even though there be considerable variation in the volume, and also that the oil which flows into the transformer will be dry, it being understood that dry or moisture free oil is to be put in in the first place.

Various modifications and changes in the specific construction herein described may be made without departing from the invention.

Having thus described my invention, I declare that what I claim as new and desire to secure by Letters Patent is,—

1. An oil containing transformer casing having an overflow pipe forming a reservoir to contain an excess volume of oil, and a settling chamber communicating with said overflow pipe and having its bottom below the opening into said casing.

2. The combination in a transformer casing adapted to contain oil, of an inverted siphon adapted to permit oil to flow to or from the casing, said siphon having its bend below the normal level of oil in the casing.

3. The combination in a closed transformer casing adapted to be filled with oil, of an inverted siphon tube connected with the interior of the casing and having its

bend below the normal level of oil in the casing.

4. The combination in a closed transformer casing adapted to be filled with oil, of an inverted siphon tube connected with the interior of the casing and having its bend below the normal level of oil in the casing, and a discharge valve in said bend.

5. The combination with a transformer casing adapted to be closed at the top, of a filling tube in the top, an inverted siphon connected to said tube and having its bend below the normal oil level in the casing, an enlarged chamber at said bend having a discharge valve, and an overflow tube extending upwardly from said bend above the normal oil level in said casing.

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

OTTO KULKA.

Witnesses:
ERNEST H. L. MUMMENHOFF,
EDWARD HOPF.