The inventions, researches and writings of Nikola Tesla

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New York, 1894

Eisenbibliothek Schlatt

Shelf Mark: EM/Rf 2

Persistent Link: https://doi.org/10.3931/e-rara-99900

Chapter XXXIV. Condensers with plates in oil.

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Condensers with Plates in Oil.

In experimenting with currents of high frequency and high potential, Mr. Tesla has found that insulating materials such as glass, mica, and in general those bodies which possess the highest specific inductive capacity, are inferior as insulators in such devices when currents of the kind described are employed compared with those possessing high insulating power, together with a smaller specific inductive capacity; and he has also found that it is very desirable to exclude all gaseous matter from the apparatus, or any ac-

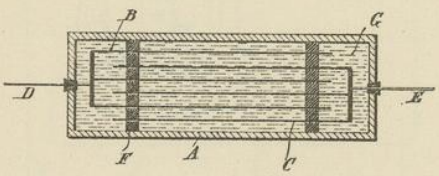

Fig. 227.

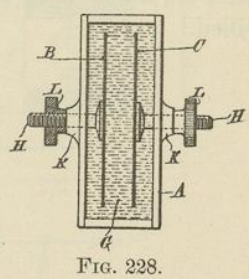

Fig. 228.

cess of the same to the electrified surfaces, in order to prevent heating by molecular bombardment and the loss or injury consequent thereon. He has therefore devised a method to accomplish these results and produce highly efficient and reliable condensers, by using oil as the dielectric[1]. The plan admits of a particular con-

1. Mr. Tesla's experiments, as the careful reader of his three lectures will perceive, have revealed a very important fact which is taken advantage of in this invention. Namely, he has shown that in a condenser a considerable amount of energy may be wasted, and the condenser may break down merely because gaseous matter is present between the surfaces. A number of experiments are described in the lectures, which bring out this fact forcibly and serve as a guide in the operation of high tension apparatus. But besides bearing upon this point, these experiments also throw a light upon investigations of a purely scientific nature and explain now the lack of harmony among the observations of various investigators. Mr. Tesla shows that in a fluid such as oil the losses are very small as compared with those incurred in a gas.

struction of condenser, in which the distance between the plates is adjustable, and of which he takes advantage.

In the accompanying illustrations, Fig. 227 is a section of a condenser constructed in accordance with this principle and having stationary plates; and Fig. 228 is a similar view of a condenser with adjustable plates.

Any suitable box or receptacle A may be used to contain the plates or armatures. These latter are designated by B and C and are connected, respectively, to terminals D and E, which pass out through the sides of the case. The plates ordinarily are separated by strips of porous insulating material F, which are used merely for the purpose of maintaining them in position. The space within the can is filled with oil G. Such a condenser will prove highly efficient and will not become heated or permanently injured.

In many cases it is desirable to vary or adjust the capacity of a condenser, and this is provided for by securing the plates to adjustable supports—as, for example, to rods H—passing through stuffing boxes K in the sides of case A and furnished with nuts L, the ends of the rods being threaded for engagement with the nuts.

It is well known that oils possess insulating properties, and it it has been a common practice to interpose a body of oil between two conductors for purposes of insulation; but Mr. Tesla believes he has discovered peculiar properties in oils which render them very valuable in this particular form of device.