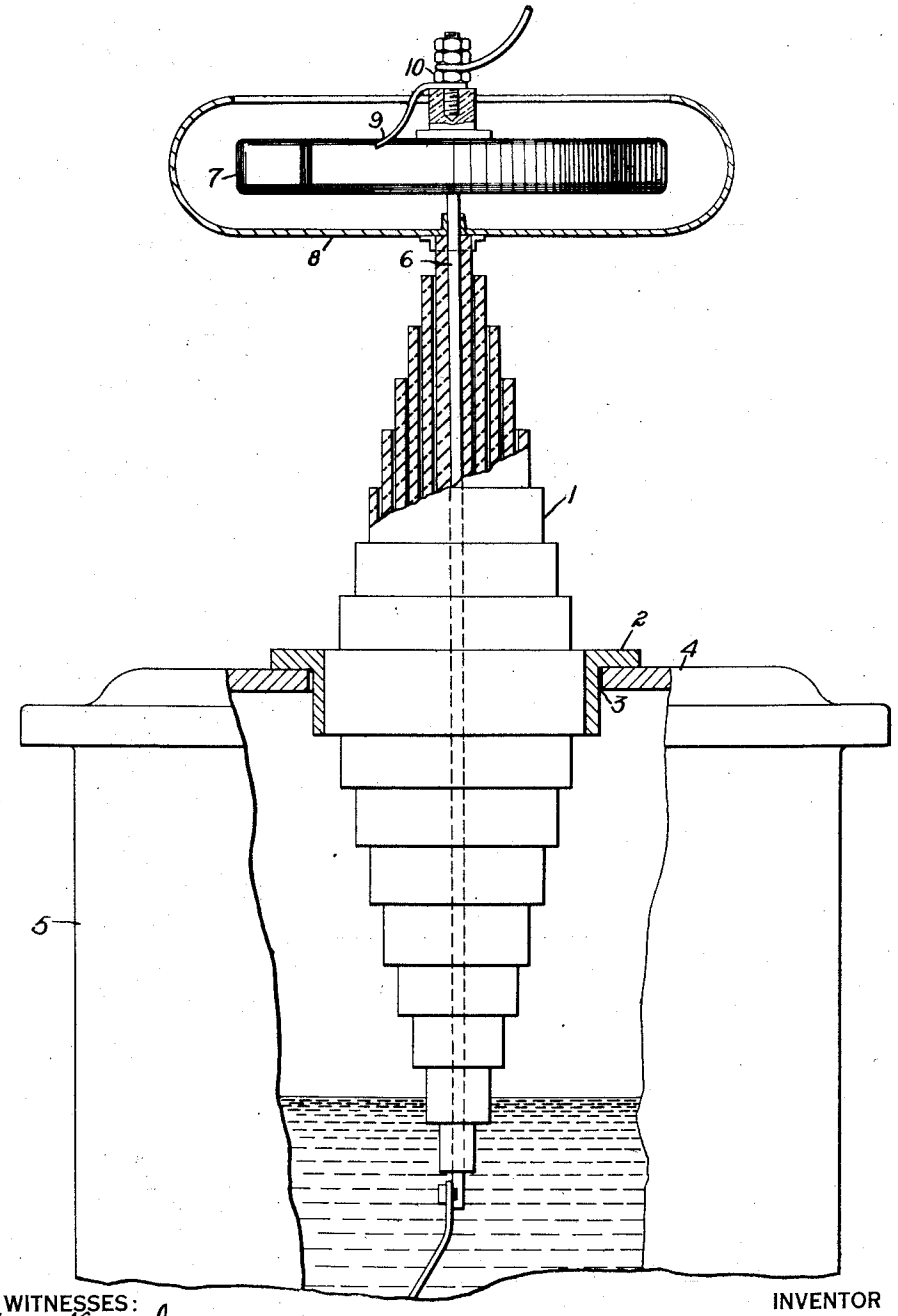
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ELECTRICAL PROTECTIVE DEVICE

Filed April 9, 1918



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Patented Mar. 18, 1924. 1,486,873

UNITED STATES PATENT OFFICE.

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ELECTRICAL PROTECTIVE DEVICE.

Application filed April 9, 1918. Serial No. 227,421.

To all whom it may concern:

Be it known that I, CHARLES LE G. FORTESCUE, a subject of the King of Great Britain, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Electrical Protective Devices, of which the following is a specification.

My invention relates to electrical protective devices and particularly to current-limiting reactors.

One object of my invention is to provide a device of the above-indicated character that shall have means for preventing the formation of dielectric stresses thereon.

Another object of my invention is to provide a current-limiting reactor that is so related to a dielectric field-distributing means, used in conjunction with the condenser terminal bushings of transformers or similar devices, as to accomplish the double purpose of distributing said field in the usual manner and preventing the high concentration of dielectric stresses on the reactor.

In Patent No. 1,129,466, issued to the Westinghouse Electric and Manufacturing Company, February 23, 1915, on an application filed by Charles Le G. Fortescue, August 7, 1911, means is disclosed for so distributing the dielectric field surrounding a bushing of the condenser-terminal type as to prevent the concentration of dielectric stresses thereon. In general, this consists of a hollow member adapted for the disposition on the outer end of the condenser terminal bushing and of such shape and lateral extent as to prevent the concentration of dielectric stresses thereon.

It has been usual, in the prior art, to provide transformers and other elecrical translating devices with current-limiting reactors to protect them against the current surges in a circuit incident to short circuits or lightning discharges. It is also well known that, in very high-voltage systems, the superposition of these surges on the highly-concentrated dielectric stresses caused by the normal voltages has been the cause of the failure of the reactors.

In practicing my invention, I so dispose a current-limiting reactor, for the protection of a translating device, within a hollow member of the above-indicated character, as to permit the latter to function in its usual manner and prevent the high concentration of dielectric stresses on the reactor.

The single figure of the accompanying drawing is a diagrammatic view of a device embodying my invention.

A condenser terminal bushing 1 is intermediately supported by a ring 2 in an aperture 3 in a cover 4 of a tank or casing 5 that is adapted to receive electrical apparatus, such as a transformer (not shown).

A centrally-disposed conductor 6, extending through the bushing 1, supports a reactance coil 7 at its upper end and is connected in any suitable manner (not shown) to the inner turn of the coil which may be of discoidal shape, as shown, or of any other suitable configuration. A hollow member 8, constituted to have an outer conducting surface preferably of ellipsoidal shape, surrounds the coil 7, the outer turn 9 of which is connected to a terminal device 10, and is supported, at the upper end of the bushing 1, in engagement with the conductor 6.

The coil 7 and the member 8, being thus electrically connected are, thereby, provided with a closed dielectric path which prevents the formation of dielectric stresses on the coil 7. The charges, therefore, are restricted to the outer surface of the member 8 and are distributed with respect to the bushing 1, as hereinbefore pointed out.

In addition to the advantages of preventing distortions of the reactor, by removing its dielectric field, economy of construction and efficiency of design are obtained by utilizing the heretofore usually unoccupied interior space of the member 8.

While I have shown and described a particular form of my invention, changes may be made therein without departing from the spirit and scope thereof, as set forth in the appended claims.

I claim as my invention:

1. The combination with a conductor and an insulating bushing therefor, of a reactor connected in circuit with the conductor adjacent to one end of the bushing, and an electric stress distributing member connected to the conductor and having a relatively wide expanse of uninterrupted conducting surface surrounding and extending transversely to the conductor between the bushing and the reactor.

2. The combination with a conductor and

an insulating bushing therefor, of a reactor connected in circuit with the conductor adjacent to one end of the bushing, and an electric stress distributing member connected to the conductor and embodying an annular portion between the reactor and the bushing having a relatively wide expanse of uninterrupted conducting surface surrounding and extending transversely to the conductor, said surface curving gradually and upwardly adjacent to its outer perimeter.

3. The combination with a conductor and an insulating bushing therefor, of a reactor connected in circuit with the conductor adjacent to one end of the bushing and a hollow electric stress distributing member enclosing the reactor and connected to the conductor, said member having a relatively wide expanse of uninterrupted conducting surface surrounding and extending transversely to the conductor from a position between the reactor and the bushing to a gradually curved outer perimetral portion laterally opposite the reactor.

4. The combination with a conductor and an insulating bushing surrounding the conductor, of a coil of substantially discoidal shape connected to, and disposed coaxially about, the conductor adjacent to one end of the bushing, and a static-stress-distributing member of substantially discoidal shape similarly disposed with respect to the conductor between the coil and the bushing and having rounded peripheral edges disposed in the plane of the coil.

5. The combination with a transformer-terminal bushing, of a reactance coil of relatively flat discoidal shape connected in series with the transformer terminal at the outer end thereof and disposed in transverse concentric relation thereto, and a hollow substantially discoidal member symmetrically surrounding said coil, said hollow member being adapted to distribute dielectric stresses between the same and said bushing and being so connected to the transformer terminal as to prevent the formation of dielectric stresses on said coil.

In testimony whereof, I have hereunto subscribed my name this 28th day of March, 1918.

CHARLES LE G. FORTESCUE.