Sept. 22, 1925. 1,554,250

H. R. WOODROW

REACTANCE COIL

Filed Nov. 2, 1921

Fig. 1.

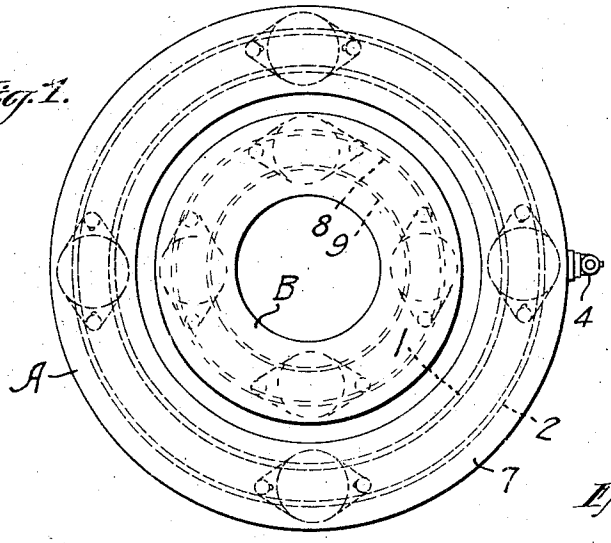


Fig. 3.

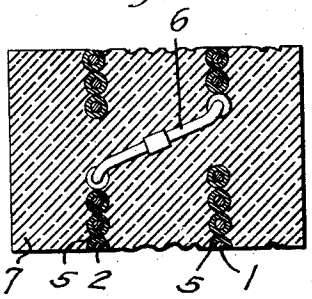
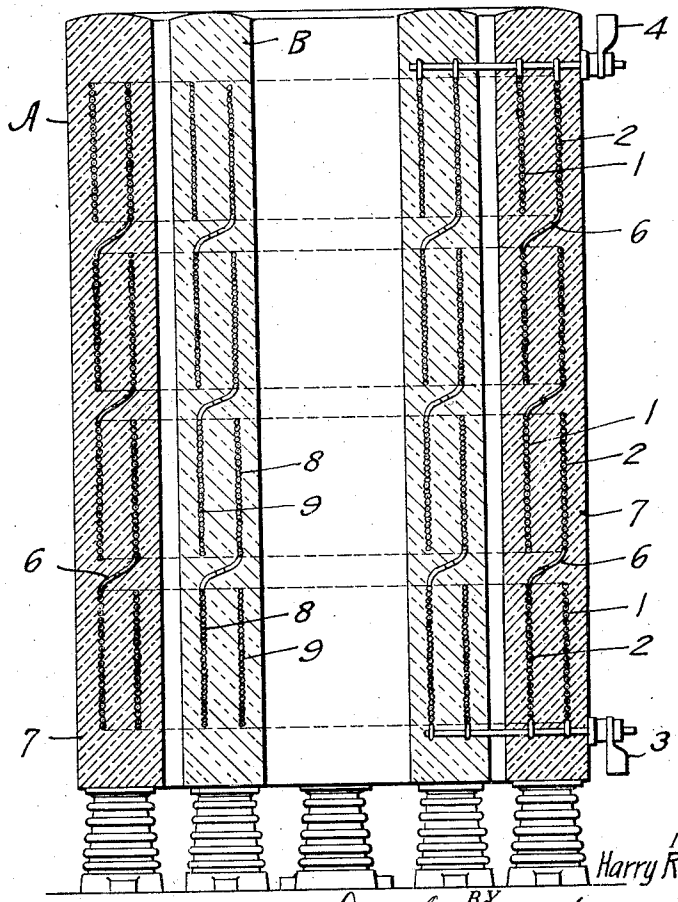


Fig. 2.



INVENTOR
Harry R. Woodrow

BY
D. Anthony Mims
ATTORNEY

Patented Sept. 22, 1925. 1,554,250

UNITED STATES PATENT OFFICE.

HARRY R. WOODROW, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THOMAS E. MURRAY, OF BROOKLYN, NEW YORK.

REACTANCE COIL.

Application filed November 2, 1921. Serial No. 512,225.

To all whom it may concern:

Be it known that I, HARRY R. WOODROW, a citizen of the United States, residing in Boston, Massachusetts, have invented certain new and useful Improvements in Reactance Coils, of which the following is a specification.

Considerable difficulty has been experienced with reactance coils as a result of the following causes,—deformation of the conductors under the heavy electric magnetic stresses produced under external short circuit conditions, short circuit occurring between turns as a result of particles falling or being drawn into the coil, and short circuit between turns due to the accumulation of moisture on the surface of the supports between turns.

My invention aims to provide a reactor in which these difficulties have been overcome and of which the advantages are shown in detail hereinafter.

The accompanying drawings illustrate an embodiment of the invention.

Fig. 1 is a plan, Fig. 2 a longitudinal section and Fig. 3 an enlarged portion of the sectional view.

The drawings illustrate a reactor made in two units and using four conductors, two in each unit. Any number of units may be used and any desired number of conductors in each.

Referring first to the outer unit, designated as a whole by the letter A, there are two wires 1 and 2 connected in parallel between the terminals 3 and 4. Each wire is surrounded by a coating or wrapper 5 (Fig. 3) of insulating material, or they may be naked wires held apart by spacers to keep the turns separated before the application of the concrete hereinafter described.

The coils are wound in the form of drums, like the coils of a solenoid for example. They are bound together by cords or tape and spaced alternately inside and outside of each other as illustrated; connecting wires 6 being introduced to connect the lower inner coil to the next upper outer coil, and vice versa. By this cross-connecting of the successive coils an equal length is secured for the two wires 1 and 2.

The coils are then cast in a body of concrete 7. The concrete fills in around each wire and holds it firmly in place throughout its entire length. The concrete also forms an insulation surrounding the entire length of each conductor, and there is no point at which the conductor is exposed to the air or to the creepage surface on the concrete, with the exception of the two terminals. The potential between turns at a maximum is comparatively small and a small thickness of concrete, where no creepage surface is present, will provide ample insulation for this voltage. The two terminals, where the current enters and leaves the coil, are at the opposite ends of the coil and separated by a long distance, thereby providing a high insulation even under a moist condition. The complete encasing of the coils in concrete makes it impossible for any material to fall into the coil or to be drawn into it to cause a short circuit between turns.

The concrete may be Portland cement concrete or may be of any other suitable plastic medium.

The structure described above may constitute the complete reactor and may contain one or more wires. Its hollow cylindrical shape has an advantage in that it readily permits additions thereto of further units inside or outside of the first. This is important because as a power station grows it is desirable to add reactors or to increase the capacity thereof. I have shown by way of example a second unit B arranged inside the first with an annular ventilating space between them. This second unit can be made separately and readily set in place within the first. If it is to be used to increase the capacity of the first unit the wires 8 and 9 thereof are connected in parallel with the other wires to the terminals 3 and 4 and are preferably made of smaller diameter so as to secure a greater number of turns and a length of wire approximately equal to the length of wires 1 and 2 of the first unit.

Though I have described with great particularity of detail a specific embodiment of my invention, yet it is not to be understood therefrom that the invention is restricted to the particular embodiment described. Various modifications in detail and in the arrangement of the parts may be made by those skilled in the art without departure from the invention as defined in the following claims.

What I claim is—

1. A reactance coil including in combina-

tion a plurality of coils in the form of drums spaced apart and arranged concentrically and a single body of a plastic medium encasing said coils.

2. A reactance coil including in combination a plurality of coils in the form of drums spaced apart and arranged concentrically with the successive turns in each drum spaced apart, and a single body of a plastic medium encasing said coils.

3. The combination of a plurality of reactance units each comprising a plurality of turns of a conductor and a cylindrical body of a plastic medium embracing said conductor, one of said units being located within the other.

4. A reactance coil including in combination a plurality of conductors in drum-shaped coils arranged alternately inside of and outside of each other and a single body of a plastic medium embracing said coils.

In witness whereof, I have hereunto signed my name.

HARRY R. WOODROW.