

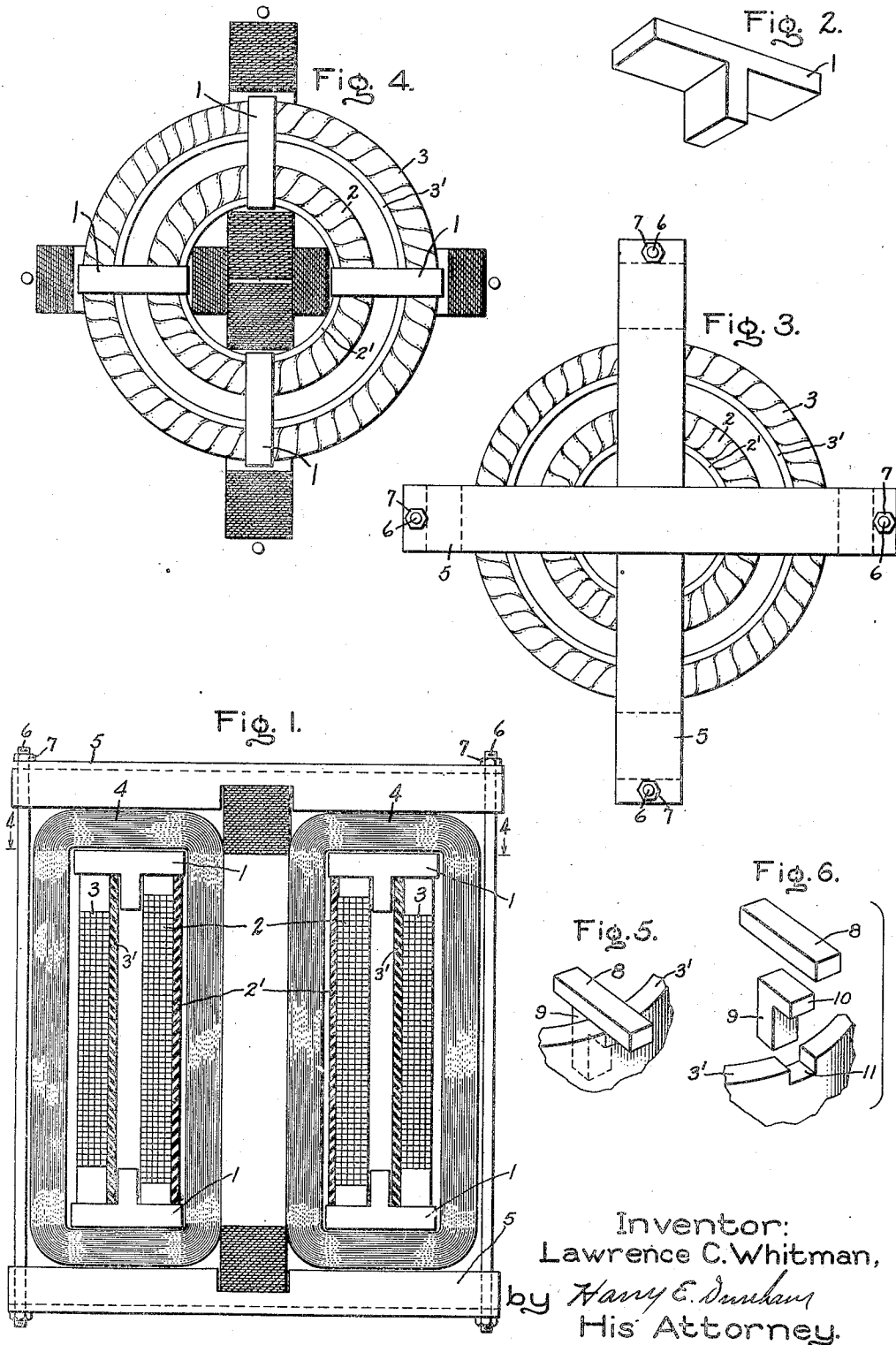
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L. C. WHITMAN

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COMBINATION COIL SUPPORT AND SPACER

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Inventor:
Lawrence C. Whitman,
by *Harry E. Dunham*
His Attorney.

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COMBINATION COIL SUPPORT AND SPACER

Lawrence C. Whitman, Pittsfield, Mass., assignor
to General Electric Company, a corporation of
New York

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1 Claim. (Cl. 175-362)

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This invention relates to stationary electromagnetic induction apparatus and more particularly to improvements in coil supports for transformers.

The coils of distribution transformers and power transformers are usually supported and spaced properly with respect to each other and with respect to the core by means of jacking screws which bear on wooden blocks or steel plates, the jacking screws being attached to the core clamps. This construction materially reduces the duct space between the coils at their ends in the regions between the various portions of the core yoke so that in the case of air-cooled so-called dry type transformers the free circulation of the cooling air is materially impeded. Furthermore, the electrical clearance and creepage distances are reduced by the presence of these jacking screws and bearing plates, and as air-cooled transformers require greater electrical clearances and creepage distances than oil or liquid-cooled transformers, such conventional coil supporting or coil clamping means are objectionable.

In accordance with the present invention there is provided a novel and simple coil support construction which comprises a spacer which is wedged between the ends of the coils or their insulating cylinders and the core yoke portions and which has a projection extending between the coils, such as the high and low voltage coils, so as properly to space them relative to each other. In this manner the coil supporting means does not extend beyond the core yoke at the sides so that the duct space between the coils is entirely clear.

An object of the invention is to provide a new and improved induction apparatus.

Another object of the invention is to provide a new and improved coil support construction for stationary electromagnetic induction apparatus.

The invention will be better understood from the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claim.

In the drawing Fig. 1 is a vertical section through a transformer which is provided with an embodiment of the invention; Fig. 2 is a perspective view of a preferred form of one of my novel coil supports; Fig. 3 is a plan view of the transformer shown in Fig. 1; Fig. 4 is a horizontal sectional view taken on line 4-4 of Fig. 1; Fig. 5 is a perspective view of a modification, and Fig. 6 is an exploded view of the modification as shown in Fig. 5.

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Referring now to the drawing, my novel coil support is shown as preferably comprising a T-shaped member 1 which may be made of any suitable material, preferred materials being glass or porcelain which give excellent creepage characteristics to ground. As shown in Fig. 1, these are inserted between the ends of the coils 2 and 3 and the yoke portions 4 of the core. The coils 2 and 3 are considered as including the usual insulating cylinders 2' and 3' which are surrounded by the respective windings and usually extend beyond the windings at both ends. The core is shown by way of example as being a divided four-part core; that is to say, it consists of four rectangular members, one side or leg of each of which collectively constitutes the core winding leg which is surrounded by the coils 2 and 3, these coils passing through the windows in the core portions. The return or outer legs of the core portions are separated by 90 degrees around the circumference of the transformer. Such four-part core construction is well known and it is a desirable construction as it provides efficient use of material. The core portions are clamped together by clamps 5 which are held in place by through bolts 6 provided with nuts 7. Space between the ends of the coils and the yoke portions of the core is usually provided in the core window of dry-type transformers in order to give the required ventilation and air striking distances.

It will be seen that the coil support also extends into the space between the coils 2 and 3, the former being typically the low voltage coil and the latter being the high voltage coil so that these supports also serve to maintain proper concentricity of the two coils.

It will be seen in Fig. 4 that the coil support members 1 are not as wide as the core portions, and as they are centered underneath the yokes of these core portions, they do not extend into the space between the core portions and thus they do not in any way restrict the free flow of air between the coils.

In the modification shown in Fig. 5 the coil support and spacer is in two parts, one part 8 being the supporting member and the other part 9 being the spacing member. This provides some flexibility in clamping strains and prevents breakage in cases of bad alignment. As shown more clearly in Fig. 6, the spacer portion 9 has an extension 10 which fits in a notch 11 in the insulating cylinder 3' for the outer or high voltage winding. This prevents the spacer member 9 from falling down in between the two concentric coils. It also pre-

vents the spacer member from moving circumferentially out of position around the coil.

While there have been shown and described particular embodiments of this invention, it will be obvious to those skilled in the art that various changes and modifications can be made therein without departing from the invention and, therefore, it is aimed in the appended claim to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

In combination, with an induction apparatus having a pair of coaxial cylindrical coils on a central winding leg of a magnetic core which has a plurality of top and bottom yoke portions extending past the ends of said coils, of a plurality of T-shaped insulating members, the leg of each T-shaped member being inserted between said coils, the cross piece of each T-shaped member being wedged between the ends of said coils and

a different one of said yoke portions whereby said T-shaped members act as top and bottom supports for both coils and also act as spacers between said coils.

LAWRENCE C. WHITMAN.

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