

UNITED STATES PATENT OFFICE.

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MAGNETIC CORE AND METHOD OF MANUFACTURE.

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Our present invention relates to magnetic cores such, for example, as those employed for telephone repeater coils or loading coils, and similar purposes.

Cores of this general type are in practice made by winding fine wire into rings, by pressing powdered magnetic material, or by means of similar expedients whereby the magnetic material is subdivided in order to reduce the eddy current losses, and in some cases, increase the magnetic stability. In the case of cores wound from wire special insulation of the individual elements from one another is generally not necessary as the thin film of oxide formed on the wire will furnish all of the insulation required. In the case of cores made up of powdered material, however, some insulation is required and this is usually supplied by employing for the body of the core a mixture of magnetic and insulating material. It is well recognized, however, that in any of these types of cores the magnetic and insulating elements cannot completely fill the space occupied by the core. Non-magnetic intermediate spaces remain which are especially injurious when located transversely to the magnetic field. These spaces may reduce the effective permeability of the core to a considerable extent.

The object of our invention is to provide a method whereby this disadvantage may largely be overcome. In carrying our invention into effect, we provide a way of filling these hollow spaces partially or entirely with magnetic material in order to increase the effective permeability. This may be accomplished by impregnating the core after its manufacture by means of a magnetic solution or fusion. In the case of a core made from pressed powdered material the impregnation is possible because of the fact that even after the material has been subjected to high pressure the mass is still permeated by a capillary network of hollow spaces.

As an impregnating medium colloidal so-

lutions of metallic iron or metallic iron alloys or other magnetic materials in readily vaporizable liquids are suitable. Preferably, the mass should be repeatedly impregnated and dried. The core may in some cases be impregnated in fused baths of Heusler alloys, or such alloys may be added in the form of fine powdered material before it is assembled, and after assembly this powder can be dispersed by heating.

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

1. The method of increasing the permeability of magnetic cores formed of pressed powdered material which consists in filling hollow spaces in the core after assembly by particles of magnetic material.

2. The method of increasing the permeability of magnetic cores which consists in impregnating the core body after assembly by immersing it in a liquid containing magnetic material in a form capable of entering the spaces in the core.

3. The method of increasing the permeability of a magnetic core which consists in impregnating the core body after assembly in a colloidal solution of magnetic material and then vaporizing the liquid of the solution.

4. The method of increasing the permeability of magnetic cores which consists in assembling the core and then impregnating the core body with a solution of magnetic material.

5. The method of increasing the permeability of magnetic cores which consists in first assembling the core, then immersing the core body in a liquid containing magnetic material in solution and then vaporizing the liquid of the solution.

In witness whereof, we have hereto set our hands this 18th day of June, 1926.

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