

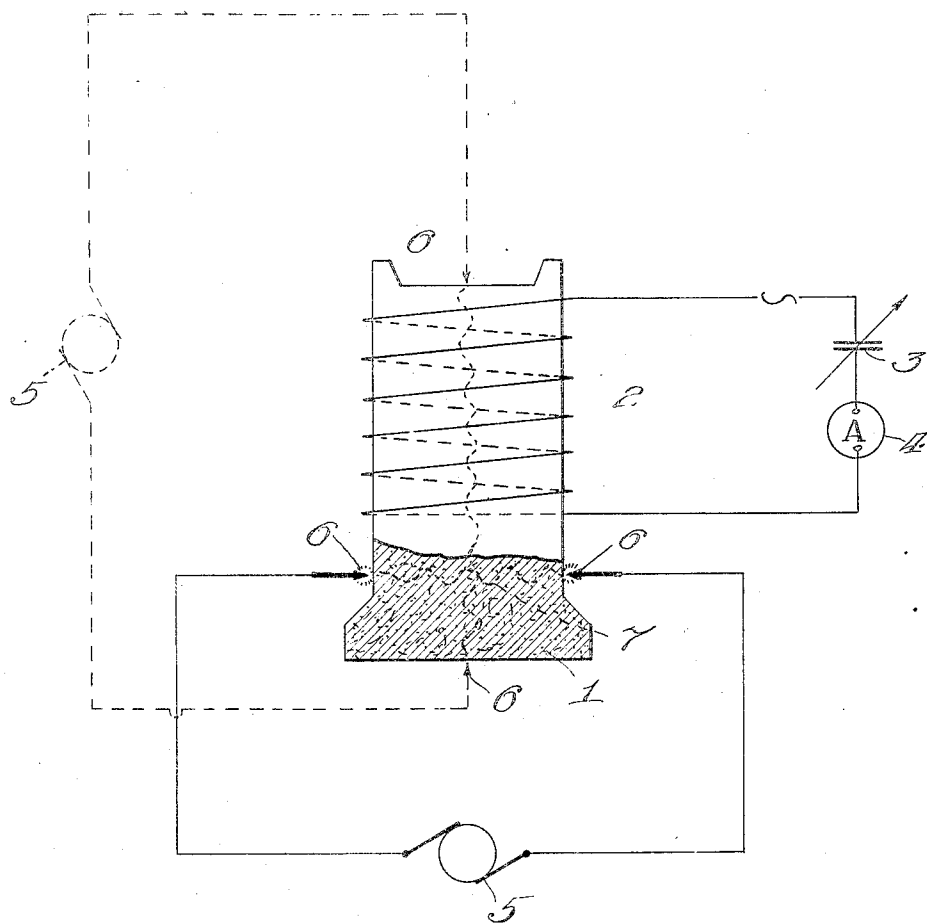
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PROCESS OF AND APPARATUS FOR STANDARDIZING MAGNETIC CORES

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PROCESS OF AND APPARATUS FOR STANDARDIZING MAGNETIC CORES

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The invention relates to methods of manufacturing, and apparatus for testing magnetic cores, said cores being made of comminuted and insulated magnetic particles to reduce the losses to desired minimum in circuits in which said cores are employed. Because of necessary standardizing of several magnetic cores when used for simultaneous alteration of inductance coils, it may be necessary to maintain these losses at a very uniform level in the production of cores. Practice shows that in the production of cores, especially in compressed form, the variations in radio-frequency resistance from the desired level may be so great that several cores will be rejected because of high loss character.

To avoid waste, the primary magnetic material has to be of such characteristics, that the highest loss cores obtainable will still be acceptable for high-frequency operation, which in turn would impart to a majority of the cores undesirably low core losses.

The present invention involves a new method of increasing the radio-frequency resistance of a core by a controllable increase of eddy-current losses after said core has been completely finished. The insulation of individual particles is found necessary to reduce said losses, and, therefore, by de-insulating or bringing several particles in close contact, the losses may be conveniently increased.

The invention will be better understood if reference is made to the accompanying drawing, which shows a convenient electrical arrangement. 1 is a core whose losses are measured in the solenoidal winding 2 which is a part of a radio-frequency series resonant circuit, consisting of said winding 2, a condenser 3, an ammeter 4, and E. M. F. of a certain frequency.

Said circuit is made resonant to the applied frequency, either by choosing inductance of the winding 2 on the core 1, or by adjustment of the condenser 3. The current in resonance is indicated by the ammeter 4 and the magnitude of it is inversely proportional to the radio-frequency resistance of the circuit. With a certain value of E. M. F. the amplitude of current, at resonance, may

be set as the standard of resistance to which value all the cores should be adjusted. Higher current amplitude indicates lower than standard resistance.

Another circuit, which consists of a source of high potential 5 and two electrodes 6, is applied directly on the core. Sufficiently high potential to break the individual insulation of the magnetic particles is applied to any section of the core where it may be desirable to increase the losses. An electric discharge from the electrodes produces conductive paths as indicated by zigzagged lines on the core, which paths increase the eddy-current losses, manifested by increase of radio-frequency resistance of the core, with corresponding decrease of the amplitude of the ammeter 4.

Practice shows that this treatment can be effectuated in the core inside the winding 2, while the radio-frequency circuit is in oscillating condition.

The direction of discharge, as indicated by the solid-line circuit, is transverse to the magnetic flux direction and, therefore, does not affect the permeability of the core.

The direction of discharge, as indicated by the dotted-line circuit, is the same as that of the flux, and the application of discharge may increase both core losses and permeability, the latter because of decreased magnetic reluctance.

If the discharge is transversely of the core, the core may be rotated while it is being standardized, in order that the electrical discharge may affect the specific resistivity of those parts of a core lying in a given plane, such as is indicated by the numeral 7.

Having thus described my invention, what I claim is:

1. The process of standardizing a magnetic core containing insulated finely-divided particles which consists in passing an electrical discharge through a path within said core until the desired standardization is effected.

2. The process of standardizing a magnetic core containing insulated finely-divided particles, which consists in passing an electrical discharge through a transverse path within

said core until the desired standardization is effected.

3. The process of decreasing the specific resistivity of any portion of a compressed magnetic core having insulated magnetic particles, which consists in passing a current of electricity through said portion, to thereby increase the core losses of said portion.

4. The process of increasing the permeability of a compressed core having insulated magnetic particles, which consists in passing a current of electricity through said core in the flux-direction of said core.

5. The process of measuring the electrical characteristics of and treating a magnetic core having insulated particles, which consists in measuring the core-losses introduced by said core into an alternating-current circuit, and increasing the core losses to a desired standard in said circuit by decreasing the specific resistivity of said core by coincidentally breaking down some of the insulation between the particles.

6. The process of standardizing a magnetic core containing insulated finely divided particles, which consists in rotating the core relatively to while subjecting it to an electrical discharge.

7. An apparatus for standardizing a magnetic core containing finely-divided insulated particles, including means for transmitting a discharge through said core, an induction coil in the field of said core, and an ammeter in circuit with said coil for indicating the increase of losses of said core.

8. An apparatus for standardizing a magnetic core containing finely-divided insulated particles, including means for transmitting a selective discharge through said core, an induction coil in the field of said core, an ammeter in circuit with said coil for indicating the increase of losses of said core, and a variable condenser.

9. The process of decreasing the specific resistivity of a compressed comminuted material having individually-insulated particles of conductive material, which consists in passing an electrical discharge through any portion of said material, thereby partially breaking down the insulation.

10. The process of decreasing the specific resistivity of a compressed comminuted material having individually-insulated particles of conductive material, which consists in passing an electrical discharge through any portion of said material, thereby partially breaking down the insulation and bringing certain of said particles into electrical contact with each other.

In testimony whereof, I affix my signature.
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