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# UNITED STATES PATENT OFFICE.

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## METHOD OF MAKING MAGNETIC CORES.

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My present invention relates to the manufacture of magnetic cores of pressed magnetic powder for induction coils and similar purposes.

The object of my invention is to provide a method whereby the manufacture of such cores will be simplified and at the same time the space occupied by the cores may be utilized to the best advantage.

The cores of induction coils and similar apparatus are generally subdivided in order to avoid excessive current losses. They are made, for example, of sheet metal strips, wire or powder. When wire or powder is used, the space occupied by the cores in many cases is not utilized to the best advantage. It is possible to compress a mixture of powdered magnetic material and insulating material in comparatively small volume by very high pressure in the cold state. The use of presure high enough to press the mixture to the smallest possible practical volume may however be injurious to the magnetic material as well as result in poor insulation. The use of very high pressures is of course objectionable from the standpoint of mechanical difficulties involved in its production.

In carrying out my invention I avoid the use of very high pressures and at the same time secure better utilization of the space by applying heat to the mixture during the pressing operation. The results obtained by my method are made possible by the use of an insulating material, the properties of which are not affected by the temperatures employed and which after cooling holds the grains of the magnetic material together securely and insulates them well electrically. The insulating material employed may be such that the temperature used in the pressing operation will remain solid, become plastic, or even liquid. For comparatively low temperatures various varieties of glass may for example form a suitable insulating material. For higher temperatures porcelain or similar materials may be employed which during the pressing operation will soften sufficiently to flow about the particles of magnetic material.

When the temperature used in the pressing operation is so high that the magnetic material becomes plastic or liquid, it is advisable to use as an insulating medium a material which is solid even at these high temperatures such for example as magnesia, which will give the pressed body the necessary mechanical strength and at the same time furnish a good insulation between the particles of magnetic material.

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

1. The method of making a magnetic core which consists in pressing a mixture of powdered magnetic material and dry insulating material and simultaneously heating the mixture.

2. The method of making a magnetic core which consists in pressing a mixture of powdered magnetic material and dry insulating material and simultaneously heating the mixture to a temperature at which one of the materials will soften.

3. The method of making a magnetic core which consists in pressing a mixture of powdered magnetic material and dry insulating material having a high fusing temperature and simultaneously heating the mixture to a temperature at which the magnetic material will soften and the insulating material will remain solid.

4. A magnetic core comprising a mixture of powdered magnetic material and dry brittle insulating material compressed into a stable form, one of said materials having been heated during the pressing operation sufficiently to soften it and cause it to flow around the particles of the other material and thereby reduce the size and number of the interstices between individual particles of the mixture.

In witness whereof, I have hereunto set my hand this 10th day of December, 1924.

WALTHER EHLERS.