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M. LATOUR
MAGNETIC AMPLIFIER
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Fig. 1

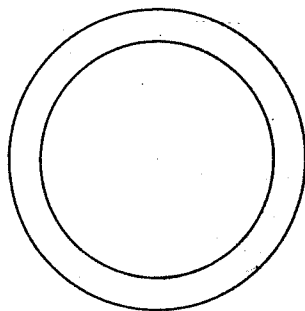


Fig. 2

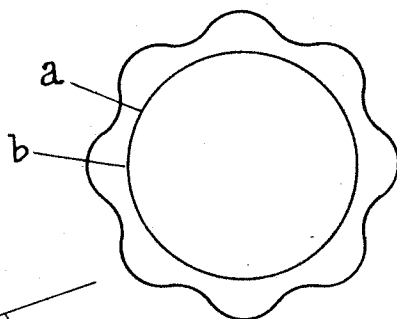


Fig. 4

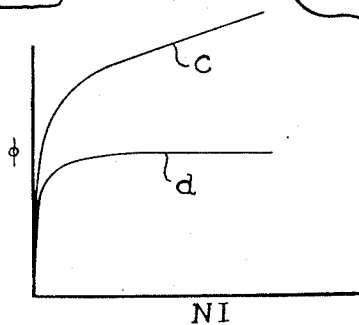
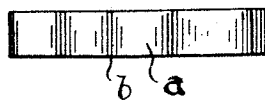


Fig. 3



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UNITED STATES PATENT OFFICE.

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MAGNETIC AMPLIFIER.

Application filed February 14, 1924, Serial No. 692,658, and in France April 10, 1923.

My invention relates to improvements in magnetic amplifiers or transformers and for modulation or keying in wireless telegraphy.

More specifically my invention relates to improvements in the magnetic circuits or cores of such magnetic amplifiers or transformers.

One of the principal objects of my invention is the provision of a core requiring a comparatively small amount of modulating energy for effecting operation of my magnetic amplifier on the substantially horizontal part of its saturation curve.

Other objects and advantages will appear from the following description of my invention taken in connection with the accompanying drawing, in which—

Fig. 1 is a plan view of an ordinary type of magnetic core.

Fig. 2 is a plan view of a preferred embodiment of my core.

Figure 3 is a side view of a preferred form of core;

Figure 4 shows saturation curves of the magnetic cores of Figure 1 and Figure 2.

Fig. 1 shows the usual type of core which is uniform in cross section whereas Fig. 2 shows the preferred embodiment of the core of my invention.

This core has restricted portions symmetrically arranged about its periphery, that is, the cross section of the magnetic circuit of this core varies successively between the limiting values a and b . In this way for low flux densities the reluctance of the magnetic circuit is the same in the case for Figure 2 as in that shown in Figure 1. This is represented in Figure 4 wherein c represents the saturation curve for the core of Figure 1 and d represents the saturation curve for the core of Figure 2. This similarity of reluctance of the two curves is due to the fact that the maximum cross section b in the core of Figure 2 is of larger cross sectional area than the cross sectional area of the uniform core shown in Figure 1. For the same number of ampere turns per

centimeter and with increasing flux densities, the magnetic circuit of Figure 2 is saturated more quickly than that of the core of Figure 1. The flux density increases much more rapidly in those portions where the cross section of the magnetic circuit is reduced. In other words, as the ampere turns are increased in value, the saturation of the constricted portions of the core shown by Fig. 2 is reached before the saturation of the uniform core shown by Fig. 1. The knee of the curve and also the substantially horizontal portion of the saturation curve of the core shown by Fig. 2 is reached at a lower value of exciting ampere turns than in the case of the usual core shown by Fig. 1. A smaller modulation current is therefore required in the primary coil of the magnetic amplifier in which my core is incorporated to effect operation around the knee and on the substantially horizontal portion of the saturation curve than with the ordinary type of core as shown by Fig. 1.

I wish it to be distinctly understood that I do not limit myself to the preferred embodiment of my invention shown and described but may use such other modifications as come within the spirit and scope of my invention.

Having described my invention, I claim:

1. An annular core of magnetic material having a plurality of restricted portions.
2. An annular magnetic core having a plurality of restricted portions uniformly spaced about the periphery of said core.
3. A core shaped to form a closed magnetic circuit, said core having a plurality of symmetrically spaced portions wherein the area of cross section is materially reduced with respect to the area of cross section of the remaining portions.
4. In a device depending for its operation upon the phenomenon of magnetic saturation, a core of magnetic material shaped to form a closed magnetic circuit, said core having a plurality of restricted portions.

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