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F. B. DOANE

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PROCESS OF DEMAGNETIZING

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Fig. 1.

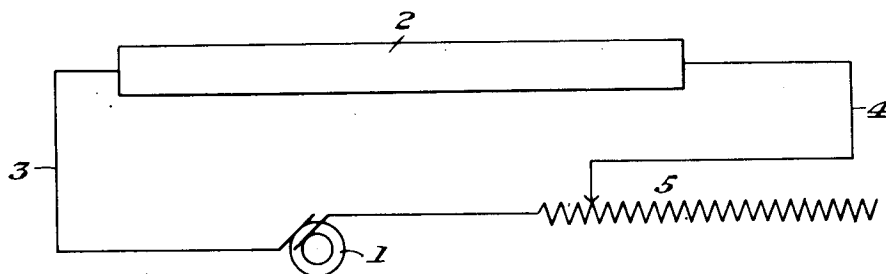
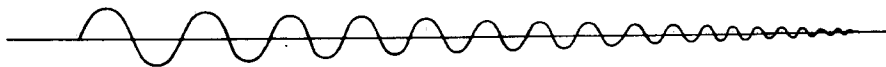


Fig. 2.



INVENTOR

Forster B. Doane
by his attorneys
Byrnes, Stebbins & Blenko

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PROCESS OF DEMAGNETIZING

Foster B. Doane, Pittsburgh, Pa., assignor to
Magnaflex Corporation, Pittsburgh, Pa., a cor-
poration of Pennsylvania

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5 Claims. (Cl. 175—181)

The present invention relates to a process of demagnetizing, and more particularly to a process of demagnetizing an object of paramagnetic material by means of an alternating electric current.

Heretofore objects of paramagnetic material, such as iron and steel, have been usually demagnetized by (1) withdrawing the article from a coil through which an alternating current is passed, or (2) placing the article in a coil and gradually diminishing the alternating current flowing through the coil.

I have found that it is possible to demagnetize such articles by passing the alternating current directly through the article and gradually reducing such current to substantially zero, thereby obviating the use of magnetizing coils.

In the drawing,—

Figure 1 illustrates diagrammatically an apparatus for carrying out the process; and

Figure 2 is a diagram showing the decreasing alternating current employed.

In Figure 1, reference numeral 1 indicates any suitable source of alternating current, such as an alternating current generator. The current will usually be taken from a power line through a step-down transformer. The article to be demagnetized, such, for example, as a steel bar 2, is connected by the lead wires 3 and 4 to the alternating current generator so that the current is passed directly through the article. A rheostat 5 by which the current can be gradually reduced is inserted in the circuit. The rheostat 5 preferably has a sufficiently high resistance so that the current is reduced to substantially zero before it is broken. Such current is illustrated diagrammatically in Figure 2.

I have found that a sufficiently strong magnetic effect can be produced in the article by passing the alternating current directly through the article, to overcome and reverse the original magnetism in the article. The alternating current passing through the article produces magnetic fluxes in reverse directions as the current goes from positive to negative half cycles, and so on. If the current is gradually reduced, the magnetism imparted by each half current cycle, while sufficient to overcome the residual magnetism left by the preceding half cycle, constantly grows less and less until, when the current is reduced to substantially zero, the magnetism is substantially destroyed.

The magnetic effect of the alternating current tends to be concentrated at the surface of the article, with the well-known skin effect. Therefore, in demagnetizing, the demagnetizing effect is greatest at the surface. In certain processes of testing iron and steel objects for surface defects and cracks, it is advantageous to permanently magnetize the article by means of an

alternating electric current in order to concentrate the magnetic flux at the surface of the article. When this is done, it is advantageous to employ the present alternating current method of demagnetizing the article, since the maximum demagnetizing at the surface can be secured with a minimum of current.

Instead of a rheostat, an induction regulator or a variable choke may be employed to reduce the current.

While I prefer to use an alternating current for demagnetizing, it is possible to use a reversing current passed through the object which is gradually reduced in strength. For example, a direct current may be passed through the object in reverse directions by means of a suitable current reversing mechanism, and the strength of the direct current gradually reduced. The action in destroying the magnetism is similar to that of an alternating current. When I speak of a reversing electric current I intend to include not only an alternating current, but also a direct current which is periodically reversed in direction.

While I have specifically illustrated and described my process and the preferred way of carrying it out, it is to be understood that the invention is not so limited but may be otherwise embodied and practiced within the scope of the following claims.

I claim:

1. The process of demagnetizing an object of magnetic material, which consists in passing an alternating electric current directly through the object, and gradually reducing the strength of the current to substantially zero.

2. The process of demagnetizing an object of magnetic material, which consists in passing directly through an object an electric current of the character and effect of an alternating current and gradually reducing the strength of the current to substantially zero.

3. A method of demagnetizing an article which consists in causing an alternating current to traverse the article, and gradually reducing the magnitude of the current substantially to zero.

4. The method of demagnetizing an article of magnetic material, including passing a direct electric current through the article itself, frequently reversing the direction of flow of the current, and gradually reducing the magnitude of the current substantially to zero value.

5. The method of demagnetizing an article of magnetic material, including establishing the naked article itself as an integral part of an electrical circuit, passing a current of the character and effect of an alternating current directly through the article, and gradually reducing the magnitude of the current substantially to zero value.

FOSTER B. DOANE.