PRACTICAL LESSONS IN ELECTRO-THERAPEUTICS.

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LESSON V.

Other Forms of Current—The Induction Coil—Interrupted Currents — Alternating Currents — Fallacy of the Term Faradic—Magneto Machines —Franklinic or Statical Electricity—Frictional Machines—Influence Machines.

Electric currents generated as before described may have some of their properties so changed, and the relative value of the factors E.M.F. and Cs. so altered, that they become distinct forms of current, and are capable of producing entirely different effects upon the human body. Of these new forms we will now consider (*a*) interrupted currents and (*b*) alternating currents. The main characteristic of the interrupted current is that it flows always in the same direction, but is stopped and started again with more or less rapidity. Alternating currents, on the other hand, alternate in direction, and are always noticeable for their high E.M.F. and small Cs.

The following diagram (Fig. 24) illustrates in a general way the difference between the three forms of current, viz., continuous, interrupted

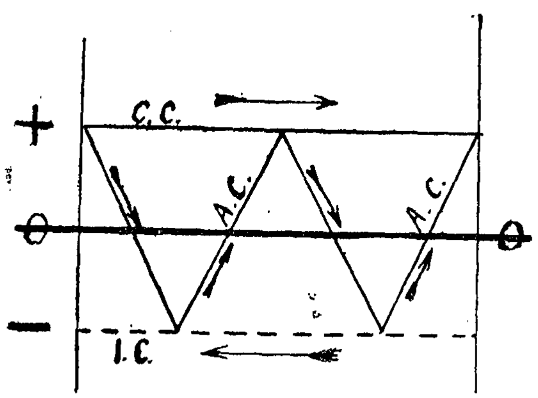

FIG. 24.

and alternating. The straight, continuous line C C represents the continuous current flowing *steadily* in *one direction.* The straight, dotted line I C represents the interrupted current flowing *intermittently* at more or less regular intervals in *one direction.* The diagonal lines A C represent the alternating currents which rush across from positive to negative, and consequently *alternate in direction.*

The most common method of changing the continuous into either the interrupted or alternating current, or both, is by means of the induction coil.

The induction coil consists of the following essential parts, viz., a primary wire, a secondary wire, each twisted into a coil; an interrupting hammer or vibrating spring, sometimes called the contact breaker, and a soft iron core.

The primary wire receives the current direct from the battery, and contains within its electric circuit the interrupting hammer. The secondary wire is entirely separate from the primary wire and insulated from the electric circuit of the battery. The soft iron core is generally adjustable and capable of sliding in and out of the centre of the primary coil. Fig. 25 represents diagrammatically an induction coil.

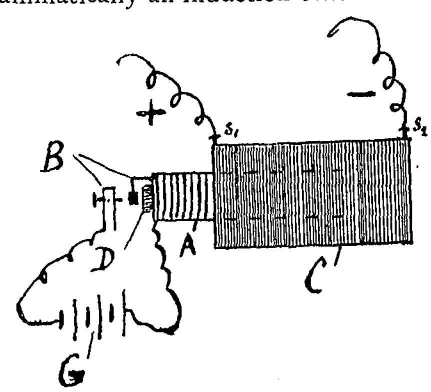

FIG. 25.

A is the primary coil, shown as a few turns of stout wire. B is the interrupting arrangement. C is the secondary coil, shown as many turns of fine wire, and pushed back a little in order to render A visible. D is the soft iron core, shown as a bundle of straight wires. G is the electric generator, shown as a battery of three cells. S_1 S_2 are the terminals from which the secondary alternating current may be conducted to the patient.

We will now trace the action of the different parts of an induction coil. The primary coil receives the current direct from the battery, but by reason of the interruptions in the circuit (caused by the interrupting hammer), and their effect upon the convolutions of wire, has set up within itself certain other currents, which are due to what is known as self-induction. The consequence is that the current obtained from the primary circuit of an induction coil is very different to that obtained from an equal length of

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