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instant its sides will be cutting the largest number of lines of force in a given time. As the coil starts from its vertical position (Fig. 1), the E. M. F. starts at zero and reaches its maximum when passing the quarter turn, then the E. M. F. will fall to zero again as the coil comes to the half turn. At this point the voltmeter connections should be reversed in some manner, because the current reverses within the coil but does not reverse in relation to the polarity of the magnetic field. If two metallic rings were fastened one to each of the ends of the coil, in such a manner that they would revolve around and with their centres at the axis of the coil, and two contact pieces making electrical contact one with each ring and connected with some external circuit, the current would alternate in the circuit from one direction to the opposite direction in each revolution, thus giving an alternating current both in the coil and the external circuit, which can be changed to a current having the same direction of flow in the external circuit by fastening two halves of a metallic ring, one to each of the ends of the coil and made to revolve with the coil, each segment being separated or insulated from the other, and two contact pieces put in contact with this ring or commutator at points diametrically opposite each other and connected to an external circuit. The E. M. F. will rise and fall twice in each revolution as before, but the E. M. F. in the external circuit will cause the current to flow in the same direction at each impulse, but the current in the coil will alternate just the same. In the case of the single coil the commutator affords a means of reversing the connections at the ends of the coil with the external circuit. Another coil (Fig. 2) can be inserted in the magnetic field with its plane at right angles to the plane of the first coil, and the metallic ring or commutator cut into four equal segments, each insulated from the other. The ends of the coils should be connected to the commutator, so that the segments connected to the ends of each coil will be diametrically opposite each other, and for convenience the connection should be made half way between the ends of the segment, so that a line drawn through the points of contact of the brushes with the commutator, and the centre of the commutator and the axis of the coils, will be either parallel or at right angles with the lines of force in the magnetic field when one coil is parallel with the lines of force. If the line through the points of brush contacts is to be parallel to the lines of force, then the ends of the coil, the plane of which is passing through a parallel position with the lines of force, should be connected to the segments on which the brushes are making contact; but when the brushes are set in a position at right angles to the lines of force, the ends of the coils would have to be extended