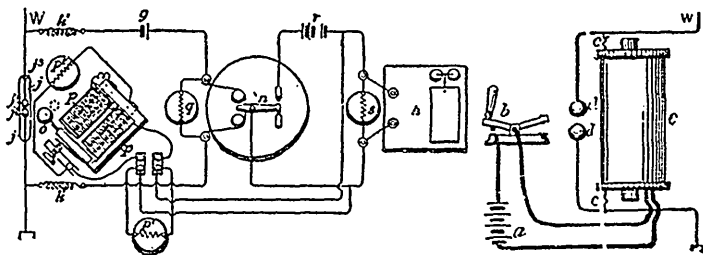


light ; the ear perceives the undulations of the air that constitute sound ; but man has no organ by which he can detect the surging of the electric waves. An instrument was necessary to supply the defect of our senses. Hertz's resonator was not sufficient, for, at a distance of more than eighty-one feet, it does not respond. The instrument required was invented, according to Mr. Marconi, by Professor Calzecchi Onesti, of Fermo, and was improved by Branly, Lodge, and others ; but other writers attribute the invention to Mr. Branly, of the Catholic Faculty of Paris. It is generally called "the coherer," and consists of a small glass tube the ends of which are closed by metal stopples. The space between the stopples is partly filled with metal filings. The tube is inserted in the circuit of the relay current of a Morse telegraph, the wires being attached to the stopples. The layer of filings offers a great resistance to the passage of the current, but, under the influence of the Heintzian waves, it becomes a good conductor, and the current passes. A rap on the tube is sufficient to cause the filings to lose their conductivity, and the current ceases to pass.

Marconi's wireless telegraph is briefly as follows : (For the accompanying diagram we are indebted to the *Scientific American*.)



The sender is little more than Hertz's vibrator. It consists of a Ruhmkorff's coil *c* with small metal spheres *d d* attached to the terminals of the secondary current *c' c'*. One sphere is connected with the earth and the other is connected with a long vertical wire *w*, insulated with tape and rubber. A Morse key *b*, is inserted in the circuit of the battery *a*, that actuates the primary current of the coil. When this key is pressed down, the primary current passes through the coil and induces the stronger secondary