



THERMOPHONE WITH THERMO-ELECTRIC RECEIVER AND MANOMETRIC FLAME TRANSMITTER.

Scientific.

AN ELECTRIC RAILWAY IN LONDON.

One of the novelties at the Crystal Palace on Easter Monday was the opening of an electrical railway, constructed by the Société Anonyme d'Electricité, of Brussels, on the Siemens system. On the upper terrace of the Palace grounds, overlooking the charming scenery of Sydenham, a miniature circular line of railway, consisting of three lines of metals, has been laid down, surrounding one of the ornamental ponds, and a small wooden hut erected besides it as a passenger station. On this railway, which is about 300 meters in length, and has a gauge of about 50 centimeters, or 19 inches between the outer rails, stands the electrical locomotive. Its length is about four feet, its breadth about a meter, its height about as much, and its weight some three-quarters of a ton. It is, in fact, a Siemens dynamo-electric machine, neatly boxed in, and mounted on a truck with four metal wheels, and provided with a brake and alarm bell for its control by the man in charge. A stationary engine of about eight horse power nominal, in a shed about thirty yards from the railway line, drives a stationary dynamo-electric machine, from which the electro-motive current is primarily obtained. Two wires are connected with this fixed dynamo machine. By one of them the current flowing out is conveyed to the mid-rail of the railway, to which it is attached by an iron plate bolted on. The second or return wire is attached to the exterior rail of the railway. The mid-rail is supported upon wood blocks, and is thus in a certain degree insulated.

Beneath the electrical locomotive a brush of iron wires sweeps the mid-rail, and the electrical current is thus taken up into the locomotive, where it passes through the mounted Siemens machine within it, the large bobbin of which is thereby caused to revolve, and the current passing away by the wheels of the truck to the exterior rails of the road, is conveyed back to the stationary dynamo-machine. As the current thus circulates, and the bobbin of the mounted machine revolves, it drives the four wheels of the truck as the locomotive moves on, hauling after it a load of nearly three tons with ease at the speed we have named. The electrical locomotive is easily managed; by applying the brake the electro-motive current is cut off as a driving power, while the wheels are at the same time mechanically skidded. By reversing the current the locomotive can be driven in either direction, as desired. The circulation of the electro-motive current from the stationary dynamo-machine to the mid-rail, and from the mid-rail to the locomotive, from it again to the outside rail, and from it back to the fixed machine, depends entirely upon the superior conductivity of the metallic wires and rails over the conductivity of the earth; and this mode of driving the electrical locomotive seems to make such a system open to difficulties upon railroad lines of any considerable length.

ON HIS FOURTH HUNDRED.—Mr. Edison took out his 301st patent on the 12th of March.

AN ELECTRIC DISCOVERY.

LONDON, May, 17.—Sir William Thomson has received from Camille Faure, a Paris discoverer, a box of electric energy. A gentleman writes to the *Times* this morning as follows:—"On Monday last in Paris a Faure battery or *pile secondaire* was charged with electric fluid direct from an ordinary Grove battery, in my presence. The receptacle consisted of four Faure batteries, each about five inches in diameter and ten inches high, forming a cylindrical leaden vessel, and containing alternate sheets of metallic lead and aluminum wrapped in felt and rolled into spirals wetted with acidulated water, and the whole placed in a square wooden box measuring about a cubic foot, and weighing some seventy-five pounds. This was protected by a loose wooden cover, through which electrodes were introduced, and were flattened down for convenience of transportation. This box of electric energy was handed me by Faure, with the object of submitting it to examination and measurement at the hands of Sir William Thomson. In about 72 hours from the time of charging the jar in Paris I had the satisfaction of presenting Faure's rare offering of a box of electricity intact. This is potent compression within a small space of one cubic foot of power equivalent to nearly a million feet. The wonderful box is now deposited in the laboratory of Glasgow University, and being submitted to a series of tests and measurements. The results of some of these made Sir William exclaim, 'Why, it is a little giant.' The advantage to science and humanity which this discovery, or rather perfection of Plante's discovery, is destined to afford are of such transcendent importance that we cannot for the present form any correct estimate of its magnitude. Whatever may be the practical results obtained, I have the satisfaction of recording for the first time to my knowledge in the history of the universe that a box of electric energy nearly equivalent to a million feet, contained within less than a cubic foot of space intact and potential, has been transported from France or elsewhere to Great Britain."

THE POLARISATION OF SOUND.

A novel hypothesis as to the polarisation of sound—perhaps it should be dignified by the title of a theory—has been promulgated by Prof. S. W. Robinson, of the Ohio State University, and as it opposes the teaching of the text-books, it may be as well that we should briefly recount the arguments of the American professor. According to the accepted theories the explanations of the phenomena of light and sound run very much on the same lines, and it is often stated that 'the dark bands produced by the interference of light resemble exactly in their explanation that of the formation of nodes and loops. But it is distinctly stated that the vibrations producing sound so far differ from those producing light, that while the former take place in the direction of propagation, the latter are transversal to the direction of propagation. It is also stated that this assumption—it is nothing more—as to the direction of the vibration of the particles of ether producing light is rendered necessary and is