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For THE CANADIAN ENGINEER.

ELECTRICITY FROM THE WIND.*

If there be one subject more than another in which I am deeply interested, that subject is electricity. And if, during the last few years, there has been one question more than another that has occupied my mind, energy and resources, that question has been, "How can I obtain electricity from the wind?" It was, therefore, with much pleasure that I read last winter, in the scientific journals of America, that on the other side of the Atlantic, in the Kingdom of Holland, was a society that had for its object the promotion of industry, and that that society had called for papers on the subject upon which I have labored so long. I consequently beg to submit the following disquisition, believing that if weighed in the balance of practicability, it will not be found wanting.

First, then, allow me to state that I have had just such a plant as you require for an illustration in operation during the last few weeks; it will, therefore, be unnecessary for me to describe a supposed installation, as I possess a real one, and as this plant is the result of a long and systematic course of study and experiment, I perhaps cannot do better, at this time, than to refer briefly to the different undertakings wherein I was unsuccessful, and at length and in detail to the system which I succeeded in perfecting; concluding with special reference to those points to which you have more especially called attention.

* Abstracts from a paper by E. O. Baldwin, Dixville, Que., read before the Netherlands Society for the Promotion of Industry, Haarlem, Holland, and compiled by the author.

After investigating the relative merits and demerits of different windwheels manufactured on the American continent, I finally procured a sixteen-foot, steel, geared wheel, called the "Aermotor," and made in Chicago. This wheel is similar to, if not identical with, a wheel of the same name sold in London, and with which you are undoubtedly familiar. The vane is attached a little to one side of the centre of the wheel, in such a manner that the wind has a tendency to turn the wheel parallel to the vane or edgewise to the wind whenever its velocity becomes abnormal. Counteracting this inclination of the wheel to turn out of the wind is a long, rigid coil spring, swinging the wheel back at right angles to the vane. The purpose of this arrangement, as you will readily understand, is two-fold: to regulate the speed and to prevent its being wrecked during a blizzard. The wheel is placed upon a tower sixty feet high and fourteen feet square at the base. In the lower part of this tower is a dynamo room; in the upper part of this is a horizontal line shaft, connected by an even bevelled gear to a vertical shaft, which vertical shaft is in turn so geared to the windwheel above, that it, and consequently the horizontal shaft, turns six times as fast as the windwheel. Upon the line shaft is a thirty-inch pulley, from which a belt runs to a ten-inch pulley on a countershaft. This countershaft carries a twenty-inch pulley, from which a bolt runs to a four-inch pulley on the dynamo, which is a one kilowatt, one hundred and ten volt, shunt wound, Edison-type machine, requiring a speed of eighteen hundred and thirty revolutions per minute.

Having set up and connected this windwheel and dynamo, my next undertaking, and the one with which I experienced most difficulty, was to so regulate this machinery as to generate an invariable electro-motive force. Of course the regulating device of the windwheel, to which I have referred, while controlling the speed closely enough for most mechanical operations, did not hold the velocity of the dynamo steadily enough. Next I undertook to produce a constant voltage by regulating the velocity of the dynamo, allowing the wheel to run at whatever speed the wind might drive it. This I undertook to do by the use of two frictional cone pulleys, one above the other, and having a centrifugal ball regulator by which an endless belt, running between the frictional cones, was shifted backwards and forwards by a carrier which worked on a long screw in such a manner as to maintain the velocity of the lower cone constant. This regulator was unsatisfactory in two respects. In the first place it consumed too much energy, as the cones had to be set very closely together to prevent their slipping upon the endless belt. In the second place it did not work quickly enough, and consequently the electric pressure would often rise or fall twenty-five or thirty volts.

Afterwards I constructed an automatic rheostat for the purpose of maintaining a uniform potential regardless of the speed of the dynamo. This rheostat, or box of resistance coils, was placed in the field circuit of the dynamo, and a small machine worked an arm backwards and forwards, which arm carried a reversible