SOEMMERING'S ELECTRO-CHEMICAL TELEGRAPH.

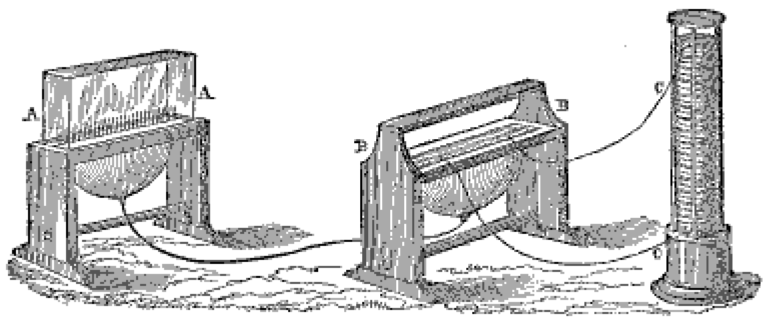
CHAPTER X.

Soemmering's Electric Telegraph of 1809—The Apparatus and Manipulation Described—Signal Keys for opening and closing the Circuits.

SOEMMERING'S ELECTRIC TELEGRAPH OF 1809.

THE telegraph invented, in 1809, by Mr. Samuel Thomas Soemmering, was an electro-chemical telegraph. He was the first to use the voltaic pile as a generator of the electric current for telegraphic purposes.

Fig. 1.



From the description, hereinafter given, it will be seen that Mr. Soemmering contemplated the use of twenty-six or more wires, or, in other words, a wire for each letter, figure, or special signal. The wires were to be insulated with silk, and arranged as seen in fig. 1, between stations A A and B B. The mechanical arrangement for putting the battery on to any given wire was very perfect, and any two of the wires could be readily connected, so as to have a return of the current to the other end of the pile, as then deemed necessary in the formation of electric currents. When the current was thus sent, the gold points connected with the two wires at the distant station gave off bubbles of oxygen and hydrogen gases, and the two letters corresponding therewith were thus denoted.

In order to have a call, he proposed to liberate a wound-up alarm, by means of the evolution of gas, but to what extent it was found practicable no evidence is to be found.

From the experiments of Mr. Soemmering, as reported to the Academy of Science at Munich, Germany, the instantaneous appearance of the gas, when the battery was thrown into the circuit, seemed to be conclusive, and he concluded that the passage of the galvanic force was instantaneous. He also found that the addition of 2,000 feet of wire in the length of his circuit, produced little or no sensible additional resistance, and that for nearly 3,000 feet of wire, the decomposition of the water, and the appearance of the gas at the distant station, commenced simultaneously with the sending of the current.

By a careful study of the process of telegraphing devised by Soemmering, the reader will readily see that there was as much in the invention as was possible with the then known science, and even to this day there has been but little advance in electric telegraphing, without the aid of Œrsted's discovery of electro-magnetism, in 1819. The chemical telegraphs of Bain, Morse, and others, are but a step beyond Soemmering.

Without further remark, I will now give a description of this early invention in the language of Mr. Soemmering.

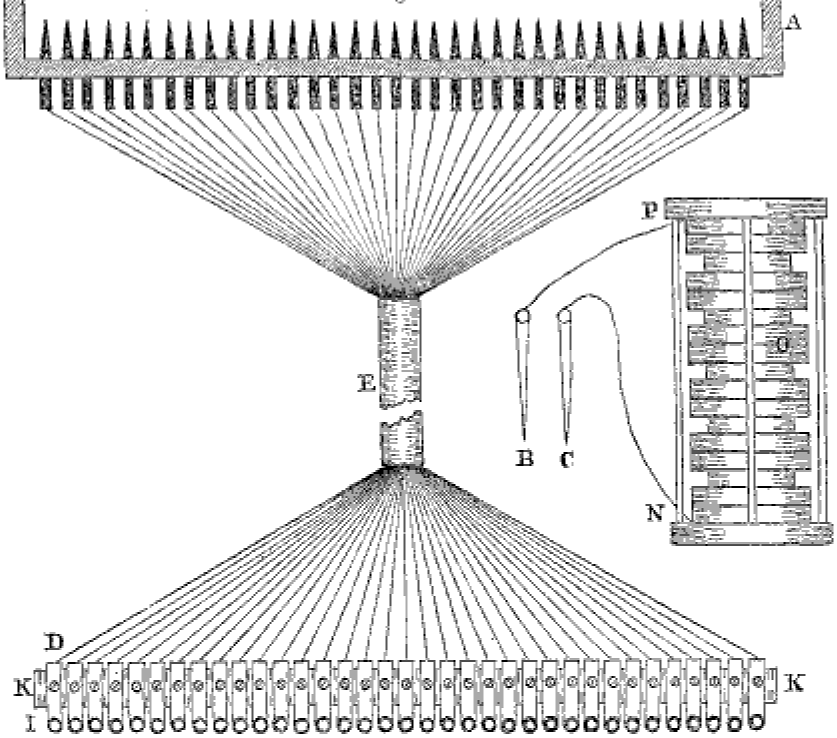
THE APPARATUS AND MANIPULATION DESCRIBED.

"The fact that the decomposition of water may be produced with certainty and instantaneously, not only at short, but at great distances from the voltaic pile, and that the decomposition may be sustained for a considerable time, suggested to me the idea, that it might be made subservient for the purposes of transmitting intelligence in a manner superior to the plan in common use, and would supersede them. My engagements are such that I have only been able to test the practicability of my plan upon a small scale, and herewith submit, for the academy's publication, an account of the experiment.

"My telegraph was constructed and used in the following manner: In the bottom of a glass reservoir, of which A A, in figs. 1 and 2, is a sectional view, are 35 golden points, or pins, passing up through the bottom of the glass reservoir, marked A, B, C, &c., 25 of which are marked with the 25 letters of the German alphabet, and the ten numerals. The 35 points are each connected with an extended copper wire, soldered to them, and extending through the tube, E, to the distant station, B B, fig.

2, are there soldered to the 35 brass plates, upon the wooden bar, K K Through the front end of each of the plates, there is

Fig. 2.



a small hole, I, for the reception of two brass pins, B and C; one of which is on the end of the wire connecting the positive pole, and the other the negative pole of the voltaic column, O, fig. 1, and as seen attached to the voltaic pile, fig. 2, by the wires C C. Each of the 35 plates are arranged upon a support of wood, K K, to correspond with the arrangement of the 35 points at the reservoir, and are lettered accordingly. When thus arranged, the two pins from the column are held, one in each hand, and the two plates being selected, the pins are then put into their holes and the communication is established. Gas is evolved at the two distant corresponding points in an instant: for example, K and T. The peg on the hydrogen pole, evolves hydrogen gas, and that on the oxygen pole, oxygen gas.

"In this way every letter and numeral may be indicated at the pleasure of the operator. Should the following rules be observed, it will enable the operator to communicate as much, if not more, than can be done by the *common telegraph.*

"*First Rule.* As the hydrogen gas evolved is greater in quantity than the oxygen, therefore, those letters which the former gas represents, are more easily distinguished than those of the latter, and must be so noted. For example, in the words *ak*, *ad*, *em*, *ie*, we indicate the letters *a*, *a*, *e*, *i*, by the hydrogen; *k*, *d*, *m*, *e*, on the other hand, by the oxygen poles.

"*Second Rule.* To telegraph two letters of the same name, we must use a unit, unless they are separated by the syllable. For example, the name *anna*, may be telegraphed without the unit, as the syllable *an*, is first indicated and then *na*. The name *nanni*, on the contrary, cannot be telegraphed without the use of the unit, because *na* is first telegraphed, and then comes *nn*, which cannot be indicated in the same vessel. It would, however, be possible to telegraph even three or more letters at the same time by increasing the number of wires from 25 to 50, which would very much augment the cost of construction and the care of attendance.

"*Third Rule.* To indicate the conclusion of a word, the unit 1 must be used. Therefore, it is used with the last single letter of a word, being made to follow the ending letter. It must also be prefixed to the letter commencing a word, when that letter follows a word of *two letters* only. For example: *Sie lebt* must be represented *Si*, *e*1, *le*, *bt*, that is the unit 1, must be placed after the first *e*. *Er*, *lebt*, on the contrary, must be represented, *Er*, 1*l*, *eb*, *t*1; that is, the unit 1 is placed before the *l*. Instead of using the unit, another signal may be introduced, the cross, †, to indicate the separation of syllables.

"Suppose now the decomposing table is situated in one city, and the pin arrangement in another, connected with each other by 35 continuous wires, extended from city to city. Then the operator, with his voltaic column and pin arrangement at one station, may communicate intelligence to the observer of the gas at the decomposing table of the other station.

"The metallic plates with which the extended wires are connected have conical shaped holes in their ends; and the pins attached to the two wires of the voltaic column are likewise of a conical shape, so that when they are put in the holes, there may be a close fit, prevent oxydation, and produce a certain connection. It is well known that slight oxydation of the parts in contact will interrupt the communication. The pin arrangement might be so contrived as to use permanent keys, which for the 35 plates or rods would require 70 pins. The first key might be for hydrogen A; the third key for hydrogen B; the fourth key for oxygen B, and so on.

"The preparation and management of the voltaic column is so well known, that little need be said except that it should be of that durability as to last more than a month. It should not be of very broad surfaces, as I have proved that six of my usual plates (each one consisting of a Brabant dollar, felt, and a disk of zinc, weighing 52 grains) would evolve more gas than five plates of the great battery of our Academy. As to the cost of construction, this model which I have had the honor to exhibit to the Royal Academy, cost 30 florins. One line consisting of 35 wires, laid in glass or earthen pipes, each wire insulated with silk, making each wire 22,827 Parisian feet, or a German mile, or a single wire of 788,885 feet in length, might be made for less than 2,000 florins, as appears from the cost of my short one."

SIGNAL KEYS FOR OPENING AND CLOSING THE CIRCUITS.

Before concluding this chapter, I will add a few explanations in regard to the figures 1 and 2 relatively. Fig. 1 is a perspective view, embracing the two offices. A A is one station and B B the other, C C is the voltaic pile at B B. The wires from A to B are united into a cord and lashed together, but each wire insulated one from the other.

Fig 2 is a different view of the sending station B and of the receiving station, A. O is the voltaic pile as seen in fig, 1, represented by C C. The signal keys, B C, fig. 2, close the circuit by being placed in the holes, I, of the frame, K K. To each of these metallic holes is connected one of the line wires. The metallic points at the other station, A, each of which represents a given letter or figure, the same as at the station, K K. The signal keys may be applied in the form mentioned, but they may be connected with a key-board like a piano, as Soemmering indicated, so that the pressure upon any key will form the metallic contact, and transmit the electric current on the wire representing the letter touched, as practically operated in the telegraphs of the present day. The forms given in the figures are thus presented, to enable the reader to understand the organization of the ingenious arrangement devised by Soemmering for telegraphic purposes. Amidst the many inventors of the different contrivances of telegraph apparatuses, the name of Soemmering is entitled to stand in bold and golden letters, for certainly, his combination was a rapid stride toward the consummation of a practical electric telegraph, the most transcendant star in the inventive galaxy of the present century.