

GENERAL ELECTRIC COMPANY

INTERNAL CORRESPONDENCE



SUBJECT

LOCATION

REFERRING TO

River Works, W. Lynn, Aug. 12, 1927.

Mr. John W. Hammond,

News Bureau,

Schenectady Works.

Dear Mr. Hammond:

The historical narrative of electrical events in the pioneer days, which you have been at great pains to collect and put together, carry me back in retrospection to the time when I first began to see that electrical applications must have a great future and especially that electric illumination would probably be the earliest development on a large scale.

Having worked, at eleven years of age and on, with electrical apparatus, generally of my own construction, it was natural that I should have acquired an intense interest in all advances in electrical science and its applications, which I could either witness or find described in books and other publications. The early experimenting included frictional electric machines and Leyden jar condensers and other things of similar nature, followed by batteries of several types, and telegraphic instruments for amateur use. When, however, as a student and teacher in the Boys' Central High School in Philadelphia, I took chief part in setting up about 40 or 50 cells of large Bunsen batteries for the purpose of running for a



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short time an electric arc light, my actual experience with heavy currents may be said to have begun. This was in the late sixties and early seventies of the last century.

The announcement, about 1870, of the invention of the Gramme dynamo, the first really practical and enduring D.C. generator, deepened my interest very greatly. I had before that known of the Ladd and Wilde machines, and soon after 1870 saw one belonging to Prof. Robert E. Rogers, of the University of Pennsylvania, in operation heating a strip of platinum wire.

A This enforced my impression, and I seemed to acquire at once a vision of the immense possibilities in the future of electrical machinery and the applications of current generated from such machines, then called dynamo electric machines. In fact, I began designing and building, even inventing, dynamos. In 1876, I built in my small workshop at home, a dynamo capable of working a small arc lamp. This was shown in my course of lectures in January, 1877 at the Franklin Institute, used as a motor, and the current for working it was supplied from a set of cells of a battery. There was no source of power to drive it in the Lecture Hall of the Institute at the time, or it would have been shown as a generator. A In the following year I built a much larger machine, with several novel features in its construction. It was a direct-current machine capable of maintaining a large arc light. It was also a two-phase alternating current machine with collector rings



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and was self-exciting. The machine was used during the winter of 1878-9 in the Hall of the Franklin Institute driven by a steam engine which had been installed there. With this machine a pair of transformers were used early in 1879 in parallel from the dynamo and stepping down the voltage from primary to secondary, probably the very first appearance of such a combination in the art.

The steam engine had been installed sometime before as a source of power in testing the dynamos submitted for test, the account of which was reported in the Journal of the Franklin Institute early in 1878 as the report of the Committee on Dynamo Electric Machines, of which Committee Prof. Houston and myself were the members in charge of the electrical testing.

Having, however, been asked to design special dynamos suited to the working of arc lights by Messrs. George H. Garrett and Thomas H. McCollin, of Philadelphia, as a consequence of the exhibition of the machine before described, as shown at the Franklin Institute in the winter of 1878, I immediately set to work to find a simple construction for the purpose. In studying the matter, there came in a flash, so to speak, the conception of the three coil (three phase) winding of armature, which ever after characterized the Thomson-Houston arc light dynamo. The thing was so simple and novel that it is no wonder that I was carried away with the idea, and though described in the original



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specification as adapted to direct current machines with a three segment commutator and suitable as an alternator with collector rings, the real application was to the former, as that was our immediate business interest. The first machine was entirely designed and wound by me and proved capable of sustaining a series of nine arcs in a series, the line current being ten amperes.

Mr. Garrett established a small factory and testing room following the operation of this first machine in March, 1879. It was not long after this that I made an important discovery which was of great value in practice. I found that in cutting out, by shunting, lamp after lamp in a series, I could make an adjustment of the commutator brushes which would keep the current at its standard value and this without destructive action at the commutator. This I found could be done even down to a short circuit. At once I set to work to make this adjustment automatic, and thus was born the Thomson-Houston Automatic Regulator, which immediately became a characteristic feature of the T.H. arc lighting system, and led to all lamps being provided with shunting switches to extinguish them at will. A successful business in arc lighting naturally gave a foundation and support for the many following developments and undertakings of the Thomson-Houston Electric Company when it was established in Lynn, Mass., under the business guidance of the late Charles A.

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Coffin, a few years later. The only person other than myself still living who is familiar with the early history given in this letter is Mr. E. W. Rice, Jr., whose assistance in the early years was invaluable.

Very truly yours,

Elmer Thomson

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