Thirty-Fourth Anniversary of the Incandescent Lamp

The Entire Electrical World Pays Tribute to Wizard Thomas A. Edison

"Edison Day is to be observed by electrical dealers and power companies in this section. The thirty-fourth anniversary of the birth of the Edison lamp is the occasion. Few of us realize that it was but a short time ago that the first incandescent lamp was made. The wizardlike accomplishments of the inventor have subsequently overshadowed his first great work and it is fitting that we should at this time pause and pay simple respect to the man.

Thomas A. Edison was born in Milan, Ohio, February 11, 1847. He was not at all strong as a child, was of fragile appearance, had an abnormally large but well shaped head, and it is said that the local doctors feared he might have brain trouble. On his 8.T. them on account of his assumed delicacy, he was not allowed to go to school for some years and even when he did attend for a short time the results were not encouraging.

The youth was indeed fortunate far beyond the ordinary in having a mother at once loving, well informed and ambitious, capable herself, from her experience as a teacher, of undertaking and giving him an education better than could be secured in the usual schools of the day. Certain it is that under this simple regime studious habits were formed and a taste for literature developed that have lasted to this day. If ever there was a man who tore the heart out of a book it is Edison, and what has once been read by him is never forgotten, if useful or worthy of submission to the test of experiments.

Our knowledge of Edison in commercial life is that of a newsboy on the trains of the Grand Trunk railroad between Port Huron and Detroit. He took up this work at the age of thirteen, and began his experiments in chemistry and physics in one of the baggage cars on this train where he maintained a laboratory, carrying all sorts of bottles, batteries, test tubes, etc.

Mr. Edison took up telegraphy in 1867, taking a position as telegraph operator with the Grand Trunk railroad at a salary of $25 per month, considered at that time to be a very high salary.

The first patent taken out by Thomas Edison was that of an electographic volt recorder, October 13, 1868. After securing many patents on the telegraph, telephone, and stock ticker, and numerous other devices, we find Edison beginning his experiments on the incandescent lamp in 1877.

There had been numerous but impracticable and commercially unsuccessful efforts by other inventors to produce electric light by incandescence and at the time he began his experiments almost the whole scientific world had pronounced such an idea as impossible of fulfillment.

The leading scientists, physicists, and experts of the period had been studying the subject for more than a quarter of a century, and had proven mathematically and by close reasoning that the sub-division of electric current was beyond attainment. These opinions were but a stimulus to Edison, for he had given the subject much thought and had become impressed with strong convictions of possibility, and was satisfied that this sub-division was not only possible but entirely practicable.

The principal features necessary to sub-divide the electric current successfully were the burning of an indefinite number of lights on the same circuit, each light to give a useful and economical degree of illumination, each light to be independent of

Thos. Alva Edison

all others in regard to its operation and extinguishment.

The opinions of scientific men were all against Mr. Edison. From a book written by Paget Higgs, L. L. D., D. S. C., he said: "Some inventors have claimed the power to indefinitely divide the electric current, not knowing or forgetting that such a state was incompatible with the well proven law of conservation of energy."

Mr. Edison made numerous experiments on the incahdescent lamp, and finally, October 21, 1879, after many patient trials, carbonized a piece of cotton sewing thread, bent into a loop or horseshoe form, and had it sealed into a glass globe, from which he had exhausted the air. This lamp, when put on the circuit, lighted up brightly to incandescence, and maintained its integrity for over forty hours, and lo! the practical incandescent lamp was born. Up to this time Edison had spent over $40,000 in his electric light experiments, but the result far more than justified the expenditure.

The next immediate step was the further investigation of the possibilities of improving the quality of the carbon filament. Edison made vast experiments of carbonized paper; these proved even more successful than the carbonized thread.

Between October 21, 1879, and December 21, 1879, some hundreds of these paper carbon lamps had been made and put into actual use in the streets and several residences at Menlo Park, N. J., causing great excitement and bringing many visitors from far and near. Edison was not satisfied with paper carbon; he therefore began to carbonize every thing in nature that he could lay his hands on. During this experimental stage he tried no less than six thousand species of vegetable growth.

One day in the early part of 1880 he noticed upon the table in the laboratory an ordinary palm leaf fan. He picked it up and in looking it over he noticed that it had a branching rib made of bamboo. He made filaments from the bamboo and found them better than anything he had tried.

The bamboo filament was used until 1893, when Mr. Edison had succeeded in making an artificial carbon from refined cotton. This replaced the bamboo, and has been in use in all carbon lamps since then.

While the Gem lamp of today is made of the same material as the carbon, it goes through a special treatment which gives it the characteristics of the metal filament, and is preferred to the carbon on account of its efficiency, which is greater. It is generally believed today that the Gem and carbon lamp will soon be replaced in every case by the Mazda, which is the latest improved type of tungsten filament lamp.

It is impossible to give an account of Mr. Edison's various patents, owing to the lack of space. However, we find his wax cylinder phonograph placed on the market in 1889. He made many improvements in the phonograph and has been giving a great deal of his attention to the perfection of his Diamond Disc phonograph in the last two years, and has succeeded in obtaining the most perfect reproduction of music ever known. About the time of the phonograph's appearance, we find the motion picture being worked upon, and in 1895 moving pictures were shown upon a screen the same as we see today in our modern picture houses. Up to 1910 the principal manufacturers of motion pictures were paying a royalty to Mr. Edison under his basic patent on the moving picture machine.

Mr. Edison is working at the present time on a large number of other inventions and is busy from eighteen to twenty hours a day.

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The Practical Lamps for Residential Lighting

The electric lamps at present available for practical use in residence lighting are all of the incandescent type. They are classified as follows:

Carbon filament;
Gem, or metalized filament;
Tantalum filament;
"Mazda," or tungsten filament.

The carbon filament lamp is the one most generally known and used, having been in service since the introduction of residental electric lighting. It has the lowest efficiency of any of the incandescents, and consequently costs the most for electric current. The carbon lamps consume from 4 watts per candle, in extreme cases, to a little less than 3 watts per candle.

The Gem, or metalized filament lamp, ranks next in efficiency. This lamp is essentially the same as the carbon filament lamp, except that the filament is treated to a metalizing process at a higher temperature, thereby giving it a higher efficiency. This lamp is rated at present at about 2.5 watts per candle.

The tantalum filament is next in order, as regards efficiency, its rating being about 2 watts per candle. This lamp was the first metallic filament lamp, and would have met with wide popularity had not the tungsten filament followed it into the market so closely.

The tungsten, and its later development, the Mazda lamp, revolutionized lighting by raising the efficiency of incandescent lighting to 1.25 watts per candle, even 1 watt per candle in certain cases. That is, a tungsten lamp gives practically three times as much light as a carbon lamp which consumes the same amount of current.

When this lamp was first introduced, the tungsten filament was extremely fragile, so that the lamps were impractical for many classes of service. The latest type of Mazda lamp, however, with its drawn wire filament ,is of such hardness that no one need hesitate to install it except where the lamp is subject to actual abuse.