

Electricity in Its Practical Application to Our Modern Every-Day Life

THE word "electricity" is derived from the Greek "electron," which means amber. The first discovery of electricity was made by the old Romans, when they found that if a piece of amber be rubbed with cloth it comes into possession of a power which enables it to attract and hold small quantities of certain matter, such as chaff, pith, paper or its like. This was looked at by the old Romans as an inexplicable phenomenon, as no one seemed to be able to explain the reason.

We have records of this discovery back in time as far as 600 years before the Christian era, so it will be noticed that electricity is not a discovery of late, as generally understood.

Step by step it has been developed, until today we would hardly recognize it as the same power originally discovered in the amber. Instead of producing it by rubbing amber with cloth we have constructed dynamos for its generation, and instead of being able to attract and hold only small bodies we have developed it into a force that turns the world's wheels of industry and that has so revolutionized the methods of transacting business that it has firmly established itself as a necessity for a modern future to do much of the world's work, as well as to make life's play more fascinating.

The only similarity between the feeble power of the amber and modern electricity is—the mystery. What is it? And how does it look? These questions were all right for the old Romans, but serve as but a poor excuse for the man of normal brains in these enlightened days of ours. It ought not to be necessary for us to see or feel a thing in order to utilize it. We do not apply the same mystery to gas or steam; still—who has ever seen either?

No Mystery to Electricity

There is no mystery to electricity, with the possible exception of the action of lightning, which human brains have not so far been able to master. Electricity follows all the common laws of nature, and the fact that its pressure and quantity is measured in volts and amperes instead of pounds and cubic feet should not confound or mystify any mind that claims ordinary intelligence. I lay particular stress on and do most emphatically condemn the very thought of mystery in connection with electricity, because I believe it to be one of the very greatest stumbling blocks that could ever be put in the way of the broadest developments of this nature's chosen agent.

Matters of law need only be thoroughly learned by lawyers, medicine only thoroughly known by physicians, architecture by architects, engineering by engineers, for the reason that these branches will only develop in their own respective lines, but electricity is rapidly entering every branch and vocation of every-day life. Already at this day it is employed in medicine, in surgery, in chemistry, in office work, in farming, in mining, in railroading, in the factory, in the residence, etc., besides all its special branches, such as telegraphy, telephony, street railway, lighting and power; it is hard in fact, to name a single branch of industry where electricity is not employed in one capacity or the other.

Its Laws Should Be Known

For this reason it seems to me imperative, that a more common knowledge of it should be spread. A young man starting into the world finds himself confronted with electrical apparatus of some kind or other in every walk of life. The man who understands the common properties of the current with its fundamental laws and rules, who realizes that it is a friend, not an enemy of mankind, will be broader and better fitted for life's battle. I do not ask that every man make of himself an expert electrical engineer, but simply to acquaint himself with its fundamental principles and adaptabilities, so that he may handle the apparatus with intelligence and eliminate all thoughts of mystery. If this could be accomplished, the field of electricity would be broadened through new discoveries and applications, and humanity benefited to an extent that we can hardly appreciate. To this end I firmly believe and sincerely hope that the day is not far distant, when such fundamental principles of electricity will be taught in our public schools, so as to encourage every brain of normal standard to contribute its share to the broadest development of this nature's most valuable agent, the possibilities of which today seem without limit.

In regard to the dangers of electricity which discourage many people from taking the interest in it they might, a very few remarks will suffice. Electricity, when properly harnessed, is as harmless as a new born babe. Compare it for a moment with steam. We are continually raising the pressure of steam to commercially meet its increasing demands. Exactly so with electricity; we are continually raising the voltage or pressure in order to cover more and more territory, which is crying for the assistance of electricity. As these dangers increase, it must be borne in mind that millions of dollars are expended every year in salaries, etc., for men of ability and long actual experience to prescribe safeguards to the public from dangers incident to electricity. It is but fair and just to say that we are steadfastly keeping abreast with the modern improvements and without preventing a single application, which will benefit the world at large, we have been able to make and enforce such measures that render accidents from this source a minimum. If ignorance and carelessness on the part of individuals could be obliterated, then our task in this respect would be nearer an end.

Where Electricity Plays Its Part

Space will not permit us to enumerate all the functions performed and made possible by the application of electricity, but it might be of interest to glance over some of the minor instances in everyday life where we meet electricity "on duty."

Let us for an illustration follow an Omaha business man through a day's work after he returns from a trip, say to Chicago. He arrives at the Union depot on time after a pleasant night's journey. The train was well lighted with electric lights, while electric fans were busily spinning around to keep him cool, and a slight push of the electric button quickly notified the porter that his services were wanted. While looking out of the window he ponders over the wonderful system of railroad signals that automatically inform the engineer if the track is clear, and which in conjunction with the mammoth electric head light, render a journey as safe in the darkest night as in broad daylight. At the depot he boards the electric elevator, that lifts him to

the street level, and in a few minutes later he finds himself comfortably seated on an electric car, speeding to his home in one of the modern flat buildings.

Before entering the car he buys a "Daily Bee," just off from the electrically driven press, to glance over the news of the entire world, received over the electric wires.

Electricity All Around Us

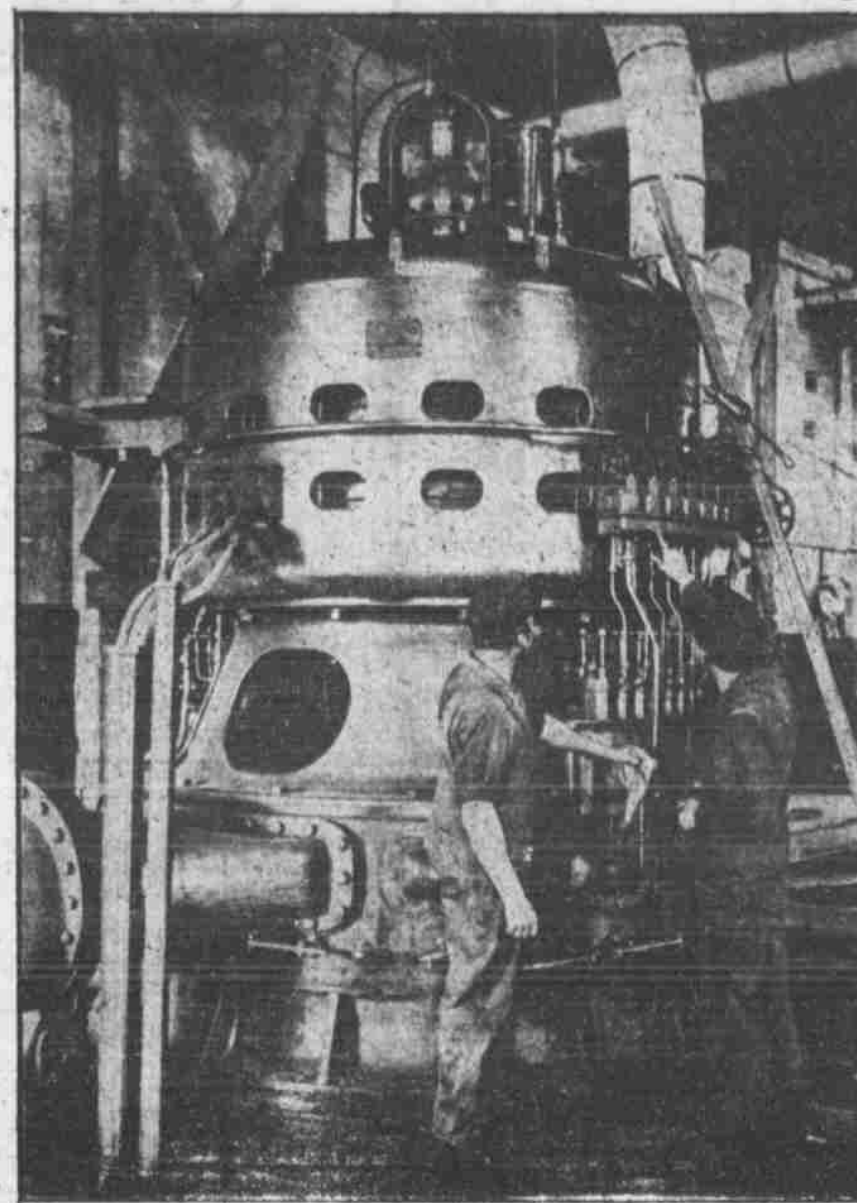
At the front door of the flat building he touches the electric button at the telephone in the vestibule, puts the receiver to his ear, and after properly identifying himself in response to the question, "Who is there?" pushes open the front door, the electric latch of which has meanwhile been released by the party upstairs pressing the proper button. In order to get the breakfast ready in the shortest space of time, the electric cooking utensils are readily put into use. The house is comfortably heated, not too hot nor too cold; the electric thermostat on the wall keeping the heat constant with less than one degree variation. Before breakfast he retires to the bath room, where an electric light bath, which combines the beneficial effects of the light rays with those of the Turkish bath, puts new life and strength into our business man for a hard day's work.

As soon as breakfast is over, the electric automobile is in waiting at the front door, and

Omaha, the other in his living room of his private residence in New York. The conversation, however, only reveals that the writer of the letter had to leave New York on his boat a few hours ago without the information requested. A turn of the crank of an "electric call box" on the side of the disappointed Omaha man's desk, quickly brings forth a messenger to whom is delivered a message to be forwarded to New York by wire, and from there by the Marconi system to one ocean steamer, speeding on its way to the other side of the Atlantic, surrounded by nothing but sky and water. Later in the afternoon a reply from this message is received in Omaha and the business is transacted as satisfactorily, although a trifle more expensively, as though the two men had been in oral communication.

Electric Fire Alarms

All of a sudden our business man hears a great commotion out in the warehouse and the call of "Fire!" He instantly rushes to the scene, only to see that the city fire de-



BIG GENERATOR AT ELECTRIC LIGHT COMPANY'S POWER HOUSE.

electric lights are turned on, while the electric exhaust fans are "pumping" away to expel the foul air from the offices; our business man glances at the big clock, regulated by electricity over the wire hourly from Washington, so the exact time may always be known, and—It is time to go home.

Electricity in the News

After a 6 o'clock dinner, Mr. Business Man locates himself comfortably in a large easy chair and starts to read the daily papers. To avoid the danger and nuisance of scratching matches an electric cigar lighter, placed within easy reach, is employed to light a good cigar and aid the digestion of the news.

Here is a heading in the paper, "Attempt to Rob Bank," while the article further discloses that the attempt was unsuccessful on account of the system of electric vault protection, applied to this and other banks, as well as the government building. The alarm was instantaneous and the police arrived on the scene before the vault could be opened. Here is an article about the wonderful cures that have been effected by the Finzen rays, named after their discoverer, the professor of Copenhagen, Denmark. Another announcement is made of a doctor, who by means of X-rays is able to see through a human body to locate broken bones, foreign substances in the flesh, photograph objects through a thirteen-inch steel armor plate, etc. Next his attention is attracted to an article about the new method of purifying flour by the electric spark and pasteurizing milk with certain rays of an electric lamp. Here is an article about the Niagara Falls plants, by which thousands of horse power, produced by the falls, that for centuries have been wasted, will be harnessed and distributed over the country at very low rates. A little mention is made of the extensive street railway systems, that are gradually honey combing this country, making traveling both more comfortable and cheaper.

Home Conveniences

It is about time for the theater; the wife is attired in her evening gown, and her naturally curly hair has received a trifling assistance from the electric curling iron. Our business man dons his evening dress, with snow white linen, ironed to a superior finish by electric ironing machines in a modern up-to-date laundry.

The two of them are soon seated in the theater facing the big steel curtain which, by means of an electric motor, is raised or lowered at will in a few seconds to protect life and property. The theater is brightly lighted with hundreds of electric lights, while electric motors are driving large fans for the purpose of driving hot air into the theater at the floor, as well as to remove the impure air at the ceiling. The performance is one of the modern scenic productions; the entire stage is one glare of electric light. Some of the actresses' costumes are handsomely decorated with miniature electric lights. There are scenes representing thunder and lightning, which, by means of electricity, are made so natural that the spectator at times wonders if it could be real or if it is but an imitation.

After the theater we find our couple back to their modern flat. Before retiring the electric chaffing dish is brought out and a light palatable lunch is indulged in. The cord of this chaffing dish is attached to the same receptacle on the wall, which is sometimes used by the lady of the house for connecting a little electric iron to smooth certain little delicate pieces that are not entrusted to the laundry. Just before retiring our business man puts one hand under the covers of the bed to ascertain if the electric heating pad has been properly placed and turned on to take off the unpleasant chill. All the electric lights in the residence are turned off, except those in the bedroom and the electric burglar alarm switch is thrown on, which at a glance shows whether or not all the windows in the residence are closed, and during the night will turn in an alarm if any window or door is opened or entrance is otherwise gained to the residence.

Can't Get Away from the Current

Both Mr. and Mrs. Business Man are soon comfortably resting on the soft bed, well prepared for a night's rest after another strenuous day's work. The Mr. has almost dozed off in the arms of Morpheus, when the question is asked:

"Did you see in the paper that a man in Loneville was electrocuted by an electric wire?"

"No."

"I notice that paper today states that it happened through his own carelessness and ignorance of the work in which he was engaged."

"Oh, well! that is the same old excuse of these large corporations to evade responsibility and the city electrician is brought up to corroborate these statements," and as he in a half dazed condition, with great efforts, employs the last remaining strength of the body to raise his hand to the switch at the bedside to turn off the electric lights, continues:

"Oh! this cruel electricity; it is nothing but a mysterious death dealing something, that ought not to be permitted to be perpetrated on an intelligent public just for the penny gain of some greedy public service corporation. Personally, I won't use the stuff in any shape, manner or form, and don't see why other people don't quit it."

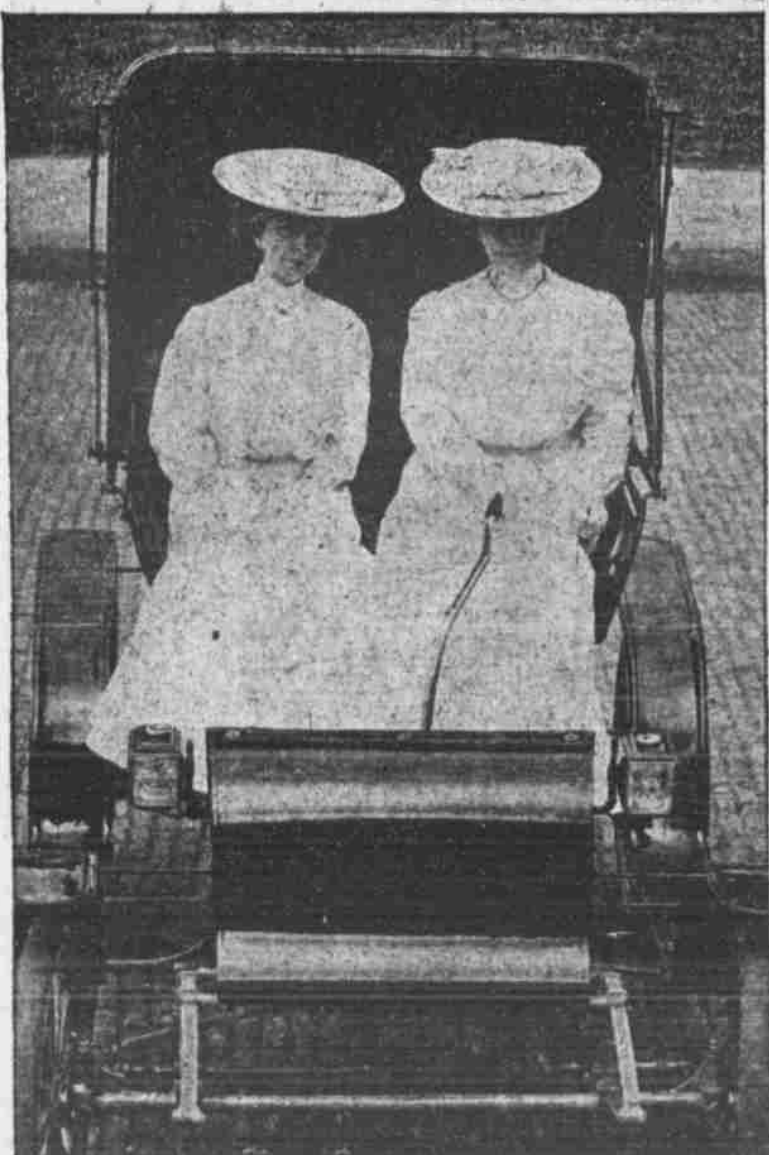
WALDEMAR MICHAELSEN,
City Electrician.



UP AMONG THE ELECTRIC WIRES.



ELECTRICAL CANCELLING MACHINE AT OMAHA POSTOFFICE.



ELECTRIC AUTOMOBILING.



BEHIND THE TELEPHONE SWITCHBOARD.

partment is just through putting out a fire, which, had it not been so promptly reported, might have meant a total loss to stock and buildings. The alarm was sent in automatically by the fire alarm system in the building, and a few moments later by the box on the nearest street corner. The moment the alarm was sent in, gongs in every fire engine room in the city, the police station and the newspaper offices were sounded by the fluid that travels 140,000 miles a second. Simultaneously with this alarm the stall door to every fire hose was electrically opened, the horses running to their harness is "dropped" on them, and men and beasts, equally faithful, dashed to what might mean instant death to them, to save the property and lives of others. The time is swiftly gliding by; but

palatable lunch is indulged in. The cord of this chaffing dish is attached to the same receptacle on the wall, which is sometimes used by the lady of the house for connecting a little electric iron to smooth certain little delicate pieces that are not entrusted to the laundry. Just before retiring our business man puts one hand under the covers of the bed to ascertain if the electric heating pad has been properly placed and turned on to take off the unpleasant chill. All the electric lights in the residence are turned off, except those in the bedroom and the electric burglar alarm switch is thrown on, which at a glance shows whether or not all the windows in the residence are closed, and during the night will turn in an alarm if any window or door is opened or entrance is otherwise gained to the residence.

What Electricity Threatens to Do in Men's Offices

IN the desire to save time, space and energy, and promote comfort and convenience, says a writer in Harper's Weekly, numerous applications of electricity have been made. The saving of time and space means the saving of money, and increased economy and efficiency are always at a premium. In the business office there are many applications of electricity to achieve this end. As an example may be cited the electric typewriter, invented when it was realized that increased speed and facility of operation could be secured if a certain amount of the energy used by the typist was supplied mechanically, and that the most convenient method for doing this was the electric motor operated by current from the ordinary lighting circuit of a small battery. Then, by simply touching the keys, as effective work could be done as by a blow of considerable force. The same principle was also applied to the adding and calculating machines now so useful in banks and other commercial establishments. In this case, after the appropriate keys have been struck, the gearing of the machine is revolved by an electric motor, and the total is automatically given without further attention from the operator, who, with machines of the older type, was forced to move cranks or levers.

The next interesting instrument that one finds in an up-to-date electrically equipped office is the teleautograph, which automatically reproduces handwriting in facsimile at a point more or less distant. Where it is necessary to give exact information to a number of per-

sons simultaneously and have the same a matter of record, this instrument is very convenient. For example, a train dispatcher can announce the movements of trains to a number of officials stationed at different points by simply writing a single message. The device is also employed by newspapers and other concerns for writing bulletins, while for direct communication between two persons the apparatus possesses obvious advantages. When used in a bank the cashier or teller may inquire from the bookkeeper as to the amount of balance or other particulars of a customer's account, the message and the answer being noiselessly sent and received. The same instrument, aside from its commercial applications, finds employment in fortifications, where the artillery officer charged with observing the target and computing the range and direction of fire can send from his station to the gunners in the emplacements detailed and specific instructions as to direction, elevation, etc., without the possibility of mistake or misunderstanding attending a verbal order or audible signal.

Attention might be directed, in the typical modern office, to another set of conductors, from the lighting circuit or a battery to a curious instrument mounted on a polished box, and consisting apparently of a pair of metal reels moving speedily but noiselessly, from which a fine steel wire is being rapidly wound and unwound. This is the telegraph, which is just being established as a valuable adjunct to the telephone, and capable of many useful applications, being, among other things, a substitute for the phonograph. It is susceptible of numerous

adjustments, and can be made to record or reproduce an ordinary conversation, not only after the manner of the phonograph, but also when connected with a telephone. It will record the conversation of both parties on an ordinary telephone line. Such a conversation can be subsequently reproduced at will and as many times as desired. With this same machine, by simply turning an appropriate key, a man may dictate to the machine, and then a stenographer in an adjoining room or another building can put on her head a telephone receiver connected with the telegraph, and by turning the reproducing key may listen to the dictation, and transcribe it on the machine. If the desired person is not in his office when someone wishes to communicate with him by telephone, his clerk may arrange the telegraph to receive any message, or in case the office is left alone this may be done automatically, and the message will be repeated on the return of the person called for. The telegraph as at present arranged contains about two miles of fine (1-100th inch in diameter) steel wire, which is sufficient for about a half hour's conversation, but at any time a message or all messages may be effectively effaced at will when the apparatus is ready for new records. It operates on an ordinary electric light circuit, and does not require as much current for its motors as an incandescent lamp of sixteen-candle power. Another interesting form of telegraph is one arranged for repeating and reproducing a conversation, and it has been found that from a single record on the steel wire a number of reproducing circuits can be led.