GAS AND ELECTRIC NEWS

PUBLISHED BY

THE ROCHESTER RAILWAY & LIGHT CO.

VOL. 4 AUGUST 1916 NO. 2

Night View of Main Office Building

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Accounting by Machinery

BY PAUL J. MILLER

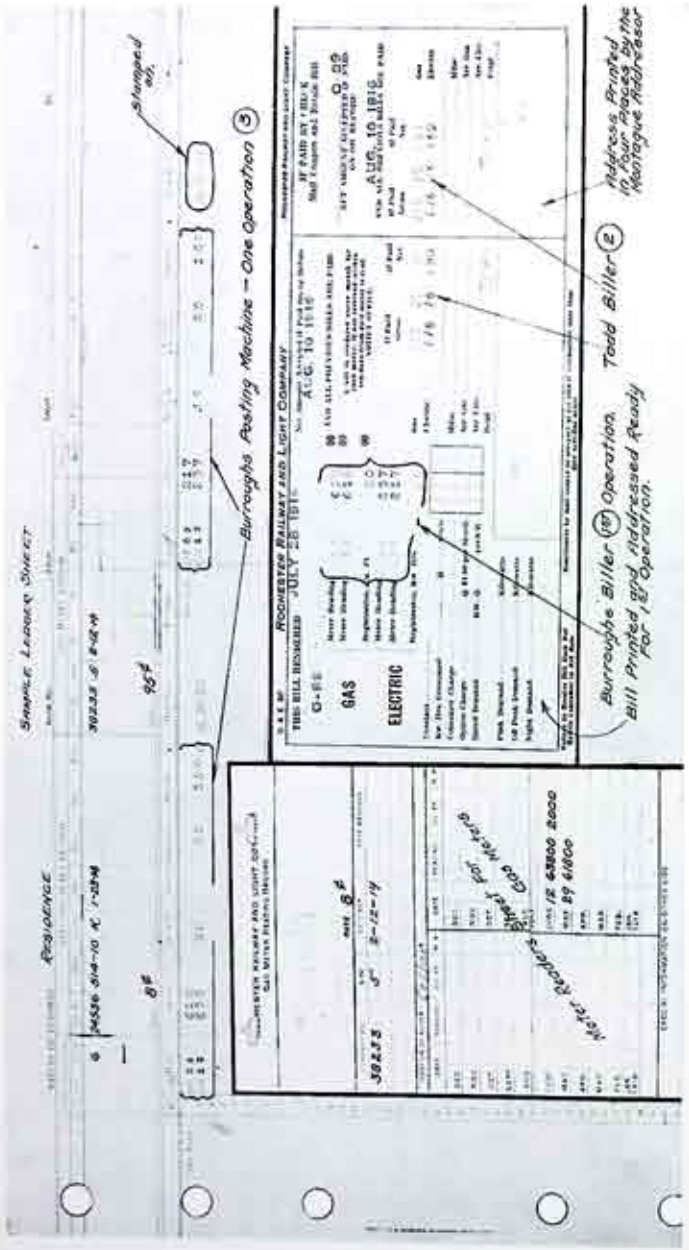
MACHINERY is indispensible in the modern office. It has become such an important factor in office systems and up-to-date methods of accounting and recording that these systems could hardly be put into effect without the use of it. In exactly the same way that modern machines in the factory and in the field have advanced means of production, so the various machines used in the office of to-day, have saved inestimable time and labor, and have provided the utmost in accuracy, speed and general efficiency.

The purpose of this article is to enumerate and describe the use of the larger and more complex machines as used in the offices of the Rochester Railway and Light Company.

This Company has over 91,000 gas, electric and steam customers who must be billed correctly and regularly each month. At present this work is taken care of by machines, and the process may best be explained by enumerating the various steps through which a gas or electric bill passes, as follows:

Part of Billing and Posting Group in Consumers' Ledger Department. Burroughs Ledger Posting Machine at left, Billing Machine at Right.

The meter reader records the meter reading and date in his book which is provided with a sheet for each customer in his district. The book



Sample meter reader's sheet, customer's bill, and ledger sheet, showing method of billing gas and electric customers from the time the meter is read until the account is posted

is returned to the office and is given to one of the operators of the Automatic Burroughs Billing Machines. These machines were put into operation December, 1915. The operator inserts a previously addressed bill into the machine and punches the keys representing the dates, and registrations of the current and previous meter readings. The difference between the two readings is the consumption for the period covered. After the second date and reading has been punched on the machine, the subtraction is made automatically and the bill drops into a receptacle attached to the machine.

The bills are then ready for the Todd Protectograph Billing Machines which print the gross, discount and net amounts to be paid. The operation is simple. For example, if the consumption is 2,000 cubic feet of gas, the operator turns the dial to 2,000, and upon pressing the lever, the machine automatically registers $2.10, $.20 and $1.90 respectively. For 20 kilowatts of electricity used, the machine would register $1.76, $.16 and $1.60, as shown in the accompanying cut.

Todd Gas and Electric Biller

There are seven of these machines in use—four for gas and three for electric (8c rate) bills.

The bills are then ready to be sent to the customer, but before they are sent, the items are posted on the ledger sheets by the "Burroughs Debit Posters" which were placed in operation May 1st, 1916. The Rochester Railway and Light Company is the first gas and electric utility to install such a machine.

A combination ledger account sheet is inserted into the machine and the date of reading, registration, consumption, discount and net amounts for both gas and electricity are printed on a horizontal line across the page. Simultaneously with the printing of the consumption and net amount on the ledger sheet, the same items are listed on an adding machine tape which is the original and the ledger sheet the duplicate. Upon the completion of a ledger, this listing is totaled and forwarded to the Tabulating Department with the bills, thus eliminating the process of taking the sales off separately on a regular adding machine.

A district, or approximately 3,000 accounts, is posted a day on two machines, whereas previous to the installation of these machines, five or six clerks were employed on debit posting alone.

Since this article was written the Company has purchased a Remington and also an Underwood combination billing and posting machine, to be used in the Appliance Billing Department which gets out about 3000 bills a month. With the aid of three carbons, these machines will print the bill, cashier's coupon, collector's statement, and post the account on the ledger sheet in one operation. These machines look very similar to, and are nothing more than a modified typewriter. Altho not as fast, the Underwood machine will be used as a standby for the Burroughs posting machines.

The Hollerith Sorting and Tabulating Machines are also valuable to the Company because the cost of doing the work done by them by hand, would be prohibitive. The

Type of Millionaire Calculating Machine used by this Company.

operation and use to which they are put was fully explained in an article by Mr. C. S. Jennings in the February 1916 number of the "Gas and Electric News." These machines are not owned outright by the Company but are leased under an agreement with the Hollerith Tabulating Company.

The Millionaire Calculating Machine is without doubt the most useful to this Company in connection with various arithmetical computations. Division, multiplication, subtraction and addition can be performed by it, so that any arithmetical problem can be worked out quickly and accurately.

It is stationed in the Auditing Department, Room No. 10, and is employed to work out percentages of increase or decrease in the monthly reports of operation. It is also used to compile numerous other reports and statistics. The machine is equipped with an accumulating carriage which is used when pro-rating an amount over a number of accounts by a certain percentage, the total ways appearing in this carriage as the operation proceeds. The machine is made in Zurich, Switzerland.

The adding machine is another necessity in the modern office. Long columns of figures must be added quickly and correctly by a large office force, and the logical way to save time and money is to make use of the machines which can do this work. Adding machines are made in various sizes and forms. Throughout the offices of this Company there are employed approximately twenty adding machines ranging in size from the small, hand operated, nine column style, to the large seventeen column machines. With the exception of a few, all the machines used by this Company are motor operated, and their total cost amounts to over $7,000.00.

The importance of many office machines in use every day is realized when one stops to consider that this Company has invested over $16,000.-00 in office machines, exclusive of typewriters and the many smaller mechanical devices that are used to promote general office efficiency.

A Ten Column Burroughs Motor Operated Adding Machine.

Addressographing and Printing

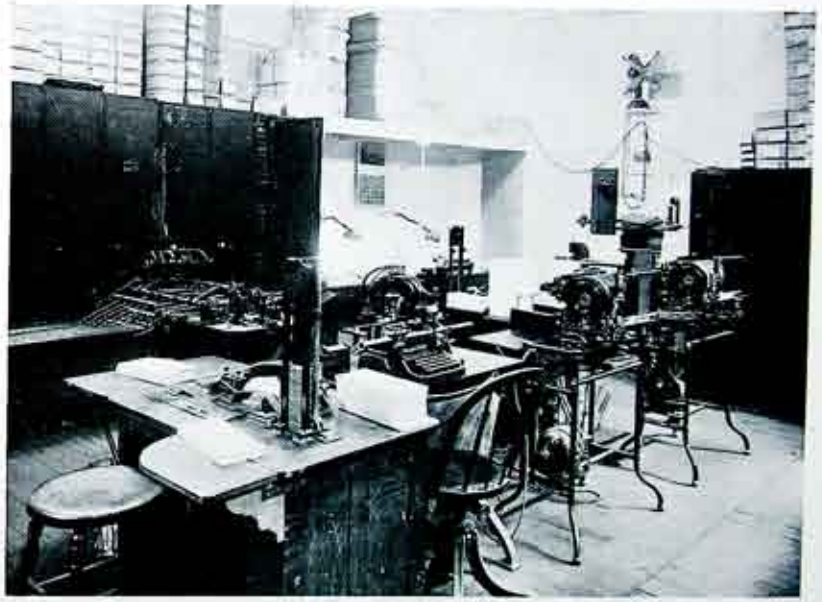
BY JOHN KOHL

THE main function of this group at present is to keep the mailing list of all customers and employees correct at all times. As customers are added or dropped, or as addresses keep changing, this Department must keep the address files corrected. During a month over 91,000 customers must receive their bills, and 1400 employees, individuals and exchanges must receive their copy of the magazine at the correct addresses.

This Department also takes care of other printing work as will be described in what follows:

The combination gas and electric bills are prepared by this group,—the first operation being the printing of the dates, ledger number, etc., by one of the Multigraph machines. These machines are also used to do many varieties of other printing, although at the present time the printing of the dates, ledger number, etc., on the bills requires the continuous use of one of them.

The other machine is used to print, by the means of electrotype plates, a large number of the many forms used by the Company. At present this Department is printing over 150 forms, and the number is increasing at the rate of about six a week. During a day the Burroughs machine prints an average of about 30,000 slips, most of which are made up into pads. It will be seen that the Company's business requires many tons of paper; during the course of a year the printing of this Department alone requires about 10 tons of paper



Office of Addressographing and Printing Groups located in basement at Main Office.

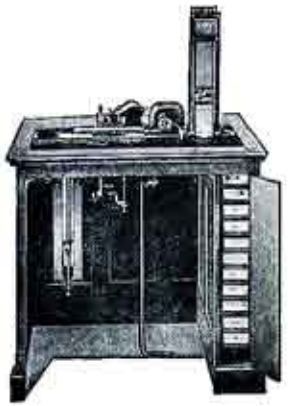
made up of blotting paper, bond, canary, Dublin white paper, etc.

When the bills have had the dates and ledger numbers printed on them by the Multigraph, they are ready to have the names and addresses printed on them by the Montague Automatic Addressing Machine which is used to address all bills, read slips, ledger account headings, envelopes, and other similar work through the medium of aluminum plates. Each plate has the name, address, code number, etc., of a particular customer

The Multigraph Senior Automatic Printing Machine.

in raised letters. The blank bills are placed on a shelf on this machine and suction fingers automatically draw one bill at a time through the machine. The bills pass over a channel through which the before-

Sample of plates used in addressographing machine.



Hand Operated Montague Automatic Addressing Machine.

mentioned metal plates are passed from the drawers in which they are retained and a typewriter ribbon passes between the plate and the bill. A platen drops as the bill and the corresponding plate reach the same point causing the reproduction of the name, address and code number on both the face and stub of the bill.

The group equipment includes two hand addressing machines which supplement the above large addressors. They are operated by a foot lever and are used to print name and address on read slips and ledger sheets and to take off any miscellaneous lists of consumers not taken care of by the larger machine. The operator printing bills on the hand addressor can print only 1,000 bills an hour whereas the automatic machine prints about 3,000 per hour.

The plates used on the addressing

Commercial Duplicator—used for detail reports of operation, etc.

machines are made on a machine called the Typograph which has a keyboard similar to that of a typewriter and is operated by an electric motor. This machine is equipped with male and female dies which stencil the name, address and code number of all accounts on the plates. The completed plates are filled in numerical order in metal drawers kept in metal cabinets. For all shut-off and remove orders, changes in address, etc., the plates are removed from the files and laid aside until several thousand of them have accumulated, after which they are

Typograph—Machine used to stencil address plates.

blanked out so that they can be used again.

The Mimeograph machine is used to print all the weekly and monthly departmental report forms and some circular letters, through the medium of "Dermatype" stencils which are prepared by the Stenographic Department. Numerous small orders of less important forms are also printed by this machine in order to save time and expense. With this machine any form that can be made up on a typewriter can be printed in any quantity desired. At the present time this machine is printing about 900 sheets a day for various departments. The accompanying cut shows one of these machines arranged for motor drive.

The Commercial Duplicator No. 2 produces copies of reports through the medium of copying ink originals, transferred to a gelatine compound. The compound is 14 inches wide and 9 feet long and is wound on a roll, the portion in use being drawn over the flat surface. The number of impressions depends upon the sizes of the copies. Approximately 30 copies can be made from one im-

Motor-driven Mimeograph—Prints copies through Dermatype stencils made on typewriter.

pression and the roll can be used 20 times. All the monthly advance and detail reports of operation and other reports of a similar nature are copied by this Duplicator.

In the Addressograph Group, there are also in use two punching machines, one having a circular and the other, a "T" punch, which are used to punch the binding holes in the meter read slips, and other forms requiring binding. A useful knife paper cutter is also part of the equipment. This cutter is able to cut almost any size or kind of paper.

The Manufacture and Use of Oxygen

BY J. H. VAIL

OXYGEN, commonly known in a gaseous form, is an "element" universally present in air, water, rocks, minerals and all forms of animal and vegetable life. The word "element" is understood to signify a substance from which it is impossible to extract more than one kind of matter.

Oxygen is described as a non-metallic chemical element, destitute of taste, color, or smell and possessing strong chemical affinities.

Its rapid combination with other elements produces combustion, and its slower combination produces oxidation.

Oxygen comprises 21% of air by volume and 23% by weight. It also forms 88.88% of water.

Oxygen is a normal component part of nearly every rock and mineral, also of all animal and vegetable tissues and fluids. It is essential to the support of animal and vegetable life, and powerfully supports combustion. Thus without oxygen there can be no air, water, fire, animal or vegetable life.

Although oxygen has for countless thousands of years existed in combination with more than all the substances briefly named, the earliest recorded discovery of the element occurred in 1727, by Stephen Hale. He obtained oxygen gas by heating minium.

Once discovered, further research naturally followed to develop other sources of supply.

To Dr. J. Priestley in 1774 is credited the first published description of its properties; he obtained oxygen by igniting mercuric oxide and gave it the name of "Depholgistigated Air."

In Sweden in 1775 Dr. K. W. Scheele also announced his discovery of the gas, and called it "Empyreal Air."

In France in 1785 Dr. A. L. Lavoisier repeated Dr. Priestley's experiments and investigated the subject more deeply, thus first definitely establishing its true character and named the gas "oxygen."

To clearly distinguish the several methods of obtaining oxygen we will classify them as chemical, electrical and mechanical production, at the same time realizing the chemical actions always present in each method.

The several chemical processes, first experimentally developed by Priestley in 1774, Scheele in 1775 and Lavoisier in 1785, were later followed by numerous other efforts to supply oxygen-gas as a commercial product. Some of the methods were to mix one part of sodium nitrate with two parts of zinc oxide; or to mix cuprous chloride with clay and sand, moistening with water and heating in a current of air to 200° C., thereby yielding oxychloride which yields oxygen when heated to 400° C.

Electrical Production. The decomposition of water by electrolysis was first discovered by Messrs. Nicholson and Carlisle in the year 1800. At this date the new copper and zinc battery devised by Volta was used for the experiments. Figure 1 illustrates a form of laboratory apparatus for decomposing water by electric current. A triple tube is used, filled with water to which a very small quantity of sulphuric acid is added. The wires from the battery pass through the outside tubes connecting with the terminal plates. When the current is applied the water apparently boils, one volume of oxygen collects in the tube having the positive terminal, and two volumes of hydrogen collect in the tube having the negative terminal. The electrolytic method of necessity could not make noticeable advancement because electric current at reasonable cost was unobtainable. The Nicholson and Carlisle discovery remained dormant for many years.

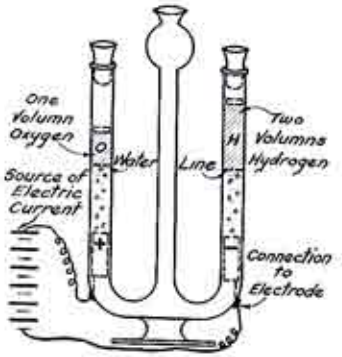


Fig. 1. Electrolytic Cell

Electrolytic method of decomposing water (H_2O) into its two constituents, oxygen and hydrogen

While these several methods of separating oxygen from its intimate association with other substances were demonstrated, it was not until the period between 1877 and 1885 that the first indications of its low cost of production for commercial purposes appeared encouraging.

A chemical method of value in the production of oxygen was commercially developed by Brin Brothers through heating barium oxide to a dull red heat in a current of air. This process proved reasonably economical and was operated successfully on a large scale. It has recently become comparatively expensive because of the growing scarcity and higher prices of the requisite chemicals, and its failing to show economic results, as compared with the processes for obtaining oxygen from air or water. The two sources of most abundant supply are air and water. There are comparatively few manufacturing operations obtaining raw material without cost.

The most recent methods in the production of oxygen have concentrated on two lines of development, which are:

The mechanical process of extracting oxygen from the air, by compressing the air to liquified form and then freezing the oxygen, now known as the Linde process; and the electrolytic process of disintegrating water into its two elements of oxygen and hydrogen first demonstrated by Nicholson and Carlisle.

In 1877 Pictet, a Swiss scientist, ascertained that by extreme pressure and cold, air and gases could be liquified, and in 1901 he announced an economical process of obtaining oxygen from air.

Another scientist "Linde" constructed, about 1885-1886, a prac-

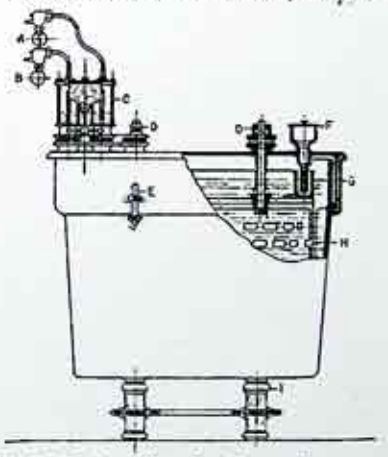


Fig. 2. Sectional View of an Oxygen Generator

A. Oxygen offtake.
B. Hydrogen offtake.
C. Indicator and pressure equalizer.
D. Positive electrode terminals.
E. Negative electrode terminals.
F. Filling cup.
G. Hydraulic joint.
H. Diaphragm.
I. Insulating supports.

DIMENSIONS OF GENERATORS

Height of cell 2' 10".
Height over all 5' 6".
Length over all 3' 9".
Width over all 1' 9".
Weight empty 1000 lbs.
Weight full 1500 lbs.

tical plant for producing liquified air. From this there was further developed by Dr. Linde the method of the distillation of oxygen from liquified air now designated as the Linde process. The efficiency of the mechanical method of production is low, but this is compensated for by the fact that the process is easily conducted, the air costs nothing, and an ample supply of cheap power is available.

The Electrolytic Process, briefly explained, consists in passing a direct current of electricity through distilled water, thereby liberating two volumes of hydrogen and one volume of oxygen. Oxygen is developed from the nickel coated positive electrode, and hydrogen from the iron negative electrode. The purity of the oxygen is from 99.5% to 99.9%. The theoretical efficiency of the electrolytic process is 3.95 cubic feet of oxygen per kilowatt-hour at the generator; this figure excludes current lost through conductors or that required for auxiliary apparatus.

The operation of the electrolytic process will produce 100 cubic feet of oxygen and 200 cubic feet of hydrogen from one gallon of water. A small proportion of caustic soda dissolved in the water reduces the internal resistance and aids the rapid decomposition of the water. The soda lasts many thousand hours, and the water supply should be regulated to constant feed. The nickel anode, and iron cathode also materially facilitate action. The electrical efficiency depends upon low internal resistance, requiring a minimum voltage, and a minimum temperature of 60 degrees C. During operation, heat is developed and maintains the electrolyte at a fairly high temperature, but an increase above 60 degrees C improves the efficiency.

As the electrolytic process gives a constant load during every hour of operation of the oxygen generators, it will be noted that the load is attractive for a central station during off-peak hours, when the consumer has the advantage of lowest cost for current. Figure 2 illustrates a sectional view of the unit type of electrolytic generator. A woven asbestos diaphragm is used to separate the two electrodes to prevent any mixing of the two gases.

In Figure 4 is illustrated an improved type of electrolytic generator designated as bi-polar. In this form of generator the electrodes are special shaped plates separated by asbestos diaphragms, and specially insulated. This type requires about one-sixth of the floor space necessary for the unit type of same productive capacity.

Industrial Applications of Oxygen. The value of oxygen for obtaining high temperatures has long been recognized. Only in recent years as noted, has low cost power developments, combined with new methods, permitted its production on a large scale for a cost sufficiently low to render its use profitable. Thus in metal working industries for instance, many operations have been revolutionized, and new methods of working have been devised.

The facility with which steel, iron and other metals can be cut or welded through the use of oxygen is really marvelous. Iron works, armor-plate mills, ship building concerns and others cut or weld their metals by this process, because the welded joint is usually stronger than the natural body of the metal. Not only is a great amount of time saved, but in innumerable instances welding operations secure the saving of valuable shafts, cylinders, pulleys, gears and other parts of mechanism that, because of defects or fractures, would otherwise be consigned to the scrap heap. The work is done with a combination nozzle having suitable adjustable regulating devices to control the supply of gases in the right proportions. A combination supply of oxygen and hydrogen gives a flame having a temperature of nearly 4,000 degrees F. while oxygen and acetylene affords a temperature of 6,300 degrees F.

Fig. 3. Equipment of Oxygen Generators in Operation

The data on the subject shows that the oxygen and acetylene combination of gas seems best adapted for work from 1-64 of an inch to 9 inches thick, and that the oxygen-hydrogen flame is suitable for cutting operations of metal from 10 inches to 24 inches thick.

It is claimed that a flame jet consuming 234 cubic feet of oxygen and 72 cubic feet of hydrogen will in seven minutes cut one lineal foot of iron 23 inches thick. The work has been developed to such a degree of proficiency that tables of reasonable accuracy are printed showing thickness of metal cut or welded, cubic feet of gas consumed, and time required per lineal foot.

Another very interesting and recent use of oxygen and acetylene gases is a metal coating process whereby a very thin coating of any metal may be applied to wood forms or plaster casts, giving the appearance of costly metal work.

The oxygen gas is shipped in forged steel cylinders, holding 100 cubic feet or 200 cubic feet compressed to 1800 pounds per square inch, by using three-stage compressors. The Interstate Commerce Commission issues stringent specifications for steel cylinders in which compressed gas can be shipped including the fittings; also specifying that such cylinders must be retested at least once in five years. All cylinders are numbered and registered, and stamped at each test, and are tested every two years. If cylinders are retained by a customer for a period exceeding one month a rental charge is made.

In addition to the methods of producing oxygen already mentioned, nature has in constant operation many of her own methods of perpetual production. The action of the sun's rays on growing vegetables, as well as on the wet leaves of trees, gives continual sources for evolving oxygen.

Oxygen is widely used in surgery and medical practice. It is the only gas capable of supporting respiration, and is frequently used in resuscitation and as a last resort to prolong life when illness has reached a critical stage, or to make less distressing the final end.

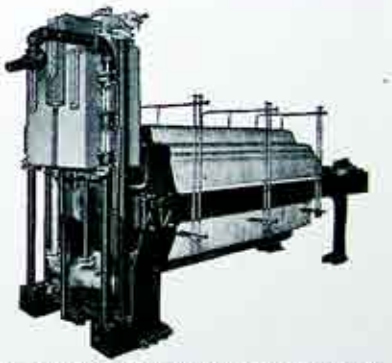


Fig. 4. Improved Type of Electrolytic Generator

It cannot be considered that all the fields of usefulness for oxygen gas and its combinations have yet been fully developed.

GAS AND ELECTRIC NEWS

Published Monthly by the
ROCHESTER RAILWAY and LIGHT CO.
34 Clinton Ave. N., Rochester, N.Y.

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Vol. IV AUGUST, 1916 No. 2

An Analysis

There are always a few individuals in every organization who attract the favorable notice of their superintendents. This often leads to the selection of these individuals for promotion. If we analyze their actions, we are almost certain to find that a definite interest and enthusiasm is being taken by them in some features of Company work which they are not required to do in order to hold their jobs.

There are in this Company many employees who, when measured by this test, pass with flying colors. Are you one of them?

The principle of give and receive is a pretty good one. Those who put the most into life get the most out of it. Those who put the greatest amount of originality and individuality into their work, those who tackle their work with vigor, snap and enthusiasm, will make themselves and their work bigger and better, and in turn better the Company's organization. Men of this calibre can't be kept down, by their association they and the Company have both benefitted, and they have both been met half way.

We often hear the old energyless complaint that a man is in a rut and must stay there because he hasn't had "a chance," "no pull," "no luck." We all know that is fiction. No man has to stay anywhere or in any position—he either isn't any bigger than the job or he simply hasn't the courage and energy necessary to pull himself out. In spite of these facts there are many efforts made in modern organizations to actually pull employees out of their respective so-called ruts into something better.

Below is a brief and partial list of questions—answer them, grade yourself, and see whether you get a passing mark for success or not.

Have you taken out insurance in the E. B. A.?

Are you saving any money?

Are you trying to fill your job as you would want it filled if you were the department head?

Do you expect to get more pay for the job you have, or, to make yourself fit for a better paid job?

Do you believe that the management gives each employee a square deal?

Does the Prize Paper Contest interest you?

Does the Educational Work mean more than, "An hour we don't work?"

Do you take Accident Prevention Work seriously?

Do you try to please the public?

Are you proud of the Company's good reputation?

The answers which will be made to these questions, will be a good index as to whether one has the elements of success, or not.

⚜

Carefulness

A very interesting case of carefulness has been called to our attention. Mr. Joseph Quetchenbach was working on an innocent looking pole which carried only some low tension direct current wires, a telephone cable and a guy wire. Mr. Quetchenbach had just cut through the insulation on the Edison wire, when due to the perspiration on his body, he was grounded against the guy wire. He cried for help, and finally became unconscious. His muscles relaxed, and his limp body was held up by the life belt which he had carefully put on, until his comrades and Firemen from the University Avenue Fire Station rescued him. Had he forgotten the life belt the result might have been fatal.

An occurrence of this kind emphasizes two things; first, the necessity for using life belts and second, the danger from accidental grounds.

⚜

"Can't Write," Fallacy

Did you ever hear anyone who said, "I can't write?" Did you believe it? Why, of course not! You knew they could talk, and that they could express their ideas very forcefully. Writing and talking are simply two different vehicles for conveying thought, and it is just as easy to load your thoughts on the writing cart as it is to place them on the talking buggy. You would rather listen to an uneducated roughneck who had a real idea to express than to a "highbrow," who let the words roll out and said nothing. So would we!

There was a time when Franklin "Couldn't Write," but he soon became very proficient and acquired a style that the present day writers all envy. Franklin is only one of many—they tied their "Can'ts" to cans, and rode to success.

⚜

Ideas

Sometimes ideas come to you about the operation of the Company—how it could be improved upon in many ways—little or big. What do you do about those ideas? Are they wasted or do you see to it that they are brought to the attention of the proper person? Many a great big important thing has grown from a little idea. Don't bury yours.

⚜

Leading the Horse to Water

You have heard the old saying, "You may lead the horse to water, but you cannot make him drink," haven't you? The same is true all the way through life and back again. Some one may devote his thought and effort to prod you along up the path to success, jolting you from behind here and yanking you up a step from in front there; but, after all, you're the one who will have to do the thinking and to get that brain trained for intensive thinking is the greatest asset you possibly could have.—*Brill Magazine.*

In the Trenches at Ontario Center

BY H. C. DEFFENBAUGH

THERE is one difference between the trenches in Flanders and those at Ontario Center. In Flanders the Germans are putting iron into the trenches as fast as the Krupp guns can supply it; at Ontario Center iron is being taken out of the trenches as fast as electrically driven excavators can remove it. Whether the product of the Ontario Center trenches finally ends its career in Flanders, no one knows.

Original Furnace at Furnaceville, Now in Ruins

Probably one of the most unique industries supplied from the Rochester Railway and Light Co. lines is the iron mine of the Furnaceville Iron Co., located about a mile north of Ontario Center, N. Y. For about seventy years various companies have been removing the layers of iron that underlie this whole region. At first when the vein of ore was near the surface, the mining was done by hand work, wheel barrows and teams. The ore taken out was shipped by boats on Lake Ontario, or smelted at Furnaceville. Later, as the slope of the vein made deeper excavation necessary, steam shovels were used to remove the earth which covers the layer of iron ore. The ore was no longer smelted at Furnaceville but was shipped to the Iron Company's furnaces at Emporium, Pa. The old smelters at Furnaceville were abandoned and now are only interesting ruins that tell of the days when transportation was not developed to the extent that it is at present.

Several years ago the final step in the excavating process was taken by electrifying all the machinery used in the mining work; the steam engines on the excavators, hoists, pumps, etc., being replaced by electric motors. Service was furnished at 11000 volts, 25 cycles from the Rochester Railway and Light Company's line that supplies the Sodus territory, and after being stepped down to 440 volts was distributed by overhead wires running parallel to the trench. In all the installation amounts to about 750 horsepower in motors; the maximum half hour demand varies from 150 to 200 kilowatts and the monthly consumption is from 5,000 to 20,000 kilowatt hours. When running at

full capacity the mine has an output of about 5000 tons of ore per month.

It may be of interest to know that this same layer of ore, which is about 22 inches thick, extends under Rochester, and can be seen in the river gorge below the Driving Park Ave. bridge. The layer of ore appears as a red streak about one-third of the distance down from the top of the east bank of the river. This ore is a red oxide containing about 45% iron and having self-fluxing qualities which make it easy to smelt. The overburden consists of about 10 feet of gravelly loam and clay, superimposed upon about 12 feet of dolomitic limestone and slate. The vein slopes away from the shore of Lake Ontario so that at Canandaigua it is about 300 feet below the surface of the earth.

The photographs show in a general way the method of operation which is as follows: From two to three well drills precede all other work, drilling 6-inch holes on varying centers through the 22 feet of overburden. These holes are fired with 40 per cent dynamite, and in general the soil and rock overburden is well shattered. The blasted overburden is picked up by a 2½ cubic yard shovel and dumped into the conveyor cars, each containing 5 cubic yards, and is removed by the conveyor to the spoil bank.

These machines remove all the overburden except the ledge of limestone which lies in contact with the ore, and a bank of spoil about 12 feet wide and 6 feet high, which lies beneath the conveyor and out of reach of the large shovel. This bank is removed at intervals by a small shovel, and the ledge of limestone is broken by hand or by dynamite and removed in skips.

Movable Ore Crusher used at Furnaceville

Conveyor and Shovel Boom

The ore is then drilled on 3 foot centers and blasted, the larger fragments being afterwards broken by a 1200 pound weight. It is then loaded

into skips by the small shovel, and hoisted to a crusher mounted on a flat car at the top of the trench. The crusher, by a belt conveyor, transports the crushed ore to cars standing on an adjacent siding.

Conveyor and Shovel

The cars are then removed by a locomotive and replaced by empties, the loaded cars being taken to the Rome, Watertown and Ogdensburg Division of the New York Central

Shovel and Hoist

and Hudson River Railroad, and shipped to the Iron Company's furnace.

These mining operations extend along a trench about 60 feet wide and ¾ of a mile long, and it requires about one year to make a complete cut. The cut is kept dry by centrifugal pumps, and the track for the crusher and cars is built as needed.

In general from fifty to seventy men are employed in the mining process, which is carried on during the daylight hours continuously throughout the year.

To anyone interested in mining or excavation work, a visit to the Furnaceville Iron Co. would be well worth the time spent. Another industry of interest in the same region is that of the C. K. Williams Co. where ore from this same ledge is ground to a powder for use in paint and paper manufacture.

THE DIRGE OF THE USED-TO-BE

In the dark and gloomy graveyard of the Things-That-Used-to-Be
A group of ghosts were gathered 'neath a weeping willow tree.
In mournful tones, with dismal groans, while tears streamed from his eyes,
A melancholy shade explained the cause of his demise.

He said, "I was an Oil Lamp and I still recall the day
When folks thought I was bright enough to light the darkest day;
But when, at last, I'd finally cast a glamour round myself
They all installed Electric Lights and put me on the shelf."

"I was a little Mule Car," another spirit cried,
"And, for a time, upon my back the world was glad to ride.
For many a day things went my way, but soon I, too, departed;
The Trolleys pushed me off the track to perish, broken-hearted."

An ancient ghost wept softly as he told his tale of woe.
He said, "I was a Mail Coach a century ago;
But conservation taught the nation how to save its breath
But now the 'Phones and Telegraphs have just talked me to death."

And so, beneath the willow trees, these mournful ghosts reside,
All dreaming of the good, old-fashioned days before they died.
With plaintive wails they tell their tales of death and dissolution,
For every one of them was killed by plain ELECTROCUTION.

Charles W. Morris, in The Edison Monthly.

Empire State Gas and Electric Association

BY I. E. POWELL

A meeting of the Production Committee of the Empire State Gas and Electric Association was held at Watertown, N. Y., on July 14th and 15th. Three sessions were conducted; one Friday and two Saturday.

About twenty-five men, interested in electric production and from nearly as many companies throughout the state, were present. This Company was represented by Messrs. I. E. Powell, P. J. O'Neill, G. Haap, H. E. Bacon and H. J. Taillie.

The following program of topics presented by the Chairman, Mr. Pierce of Syracuse brought forth many lively discussions.

1. Ways and means of improving boiler room economies.
2. Motor driven versus steam driven auxiliaries.
3. Cost data on treatment of feed water and the effect of soda ash on boiler operation or upon metal of boilers.
4. Bonus system for firemen and the average wage of firemen as compared with other men in stations.
5. Cleaning of condensers.
6. Methods of making prompt records of daily operating results.
7. Methods of insuring uniform standard coal supply.
8. Steam heating business; methods of dividing operating costs between steam heat and electric business.

Mr. Bacon of this Company read a very interesting paper on the first named subject, which brought forth considerable discussion. The main facts that were brought out indicated that it is very desirable to install each boiler and its auxiliaries as a unit so that it is possible to know just what each boiler is doing. It is also advisable to use as many meters as possible to obtain all the necessary operating data.

Mr. J. O. Fuchs of the Central Hudson Gas and Electric Company at Poughkeepsie, New York, and Mr. Taillie of this Company, presented papers and data concerning the sixth subject. The discussion showed that any system of keeping daily operating records, must be controlled by the various factors that make up local conditions.

Girls Club Outing

The regular monthly meeting of the Women's Club of the Railway and Light Company was held August 3rd in Lower Maplewood Park. A picnic supper was served to a goodly number of the members of the Club, and a thoroughly enjoyable time was had.

After the supper the girls joined in a guessing game, each one being given the opportunity to guess the contents of a suspicious looking package, about ten inches long and six inches wide, contributed by Miss Hoffman. Each girl was allowed one "feel," the prize to be awarded to the one guessing what the box contained. Many guesses were made, ranging from a set of false teeth to a box of talcum. The lucky guesser was Miss Vary, a guest of one of the Club members and formerly with the Company in the Stenographic Department. Upon opening the mysterious package it was found to contain a very beautiful hand painted bon-bon dish.

The girls then took a walk around the lake in the Park to make friends with the goldfish, but disappointment awaited them, as the fish had evidently gone to bed and were not at home to callers. The merry party then strolled through the Indian trail along the gorge to Upper Maplewood Park, where the remainder of the evening was spent listening to a concert by the Park Band. Ralph Scobell was the soloist of the evening, which was, of course, an added attraction.

Gas and Electricity in the Home

BY THE GAS DEMONSTRATORS

Mrs. Gabrielle Gay, Miss Frances E. Moore, and Miss Mona A. Pratt

Canning

Thanks to the "Gas Range" home canning and preserving is not the great task that it used to be. The housewife now gets satisfaction and enjoyment out of her canning endeavors. With perfect ease she is able to light the gas burner for a few minutes in the morning and take care of a few quarts of berries or peaches.

It is perhaps well to speak at this time of the food value of fruit. The different acids and minerals which fruit yields are an absolute necessity if the body is to be kept in good condition. At no time are these more necessary than in the winter months when fresh fruit is so expensive. Fruit canned in summer is very much less expensive than fresh fruit in winter and it has still another advantage in that the sugar added gives it a much greater food value. So by all means let us who are so fortunate as to live in Rochester where fruit is so good and so cheap, store it away for future use.

Limited space makes it almost impossible to go into the subject of canning very deeply but if we will remember a few canning principals our fruit is bound to keep well.

Perfect sterilization of all the food and utensils used and the careful sealing of the sterilized food to keep out germs is one of the chief essentials to success in canning. Inasmuch as bacteria are plentiful in air and water and a single tiny, invisible germ is sufficient to spoil a whole jar of fruit, all spoons, laddles, stewpans, strainers, funnels, bottles, jars, covers, etc., should be set over the flame in cold or boiling water and boiled ten to fifteen minutes. Glassware should be heated gradually. This will kill all spores. When the fruit is cooked the jars are set on a folded cloth, and the rubbers are dipped into boiling water and set in place. Then the cooked fruit is put into the cans with enough liquid to fill the can. The covers taken from the boiling water are quickly and securely screwed onto the jar. As soon as the jar is cool it should be stored in a cool dark place.

There is also the other method of cooking the fruit in the jars. For a small amount of fruit the trouble is hardly worth while, and for the inexperienced the method outlined above usually gives better results.

Fruit for canning should be fresh, firm and not overripe. For canning fruit, allow one-third its weight in sugar and two and one-half to three cups of water to each pound of sugar. It is best to first make the sugar and water into a syrup by boiling them together ten minutes, and then cook a small quantity of the fruit at a time in the syrup. By this method the fruit is kept whole and in perfect condition. This is not necessary with small fruits which would loose their shape anyway; these may be put in a kettle with sugar and water and cooked very quickly.

PLUMS

Plums are usually canned without removing the skins. To keep the skins from bursting they should be pricked in several places. Allow a cup of sugar to each quart of plums and about a cup of water to four quarts of plums. Make a syrup, put in part of the plums let cook about five minutes, skim into jars, fill the jars with the boiling syrup and seal. Reheat the syrup to boiling, add more plums and proceed as before.

PEACH MARMALADE

If one has a quantity of less choice halves of peaches they can be used for marmalade. Cut them up and if ripe enough press through a potato ricer. Add an equal amount of sugar to the pulp, the juice of one lemon and a dozen peach kernels. A few spices as whole cloves and cinnamon sticks may be added if liked. Cook very slowly half an hour stirring frequently to prevent burning.

PLUM CONSERVE

6 lbs. plums
2 oranges sliced
1½ lbs. large raisins seeded.
½ lb. pecan or walnut meats broken
3 lbs. sugar.

Cook the plums without water until soft and press the pulp through a sieve. Cut the oranges into quarter and then into thin slices, let stand in water to cover over night, cook until tender add with the raisins to the plums and sugar, let cook until the mixture is like marmalade. Add the nuts near the end of the cooking.

Jelly Making

Fresh made jelly is better than jelly that has been kept for months. We also know that some fruit from which jellies are made comes into season at the hot time of the year when it is much more pleasant to spend ones time in the open air than in the kitchen. Then why not as each fruit comes into season, simply make the fruit juice ready for jelly, can and store it, and then make it up at a more convenient time. The writer has done this a great many times and results have been very satisfactory.

There is still another advantage in this method; the juices of raspberries, strawberries, cherries, grapes etc., may be combined with the less expensive apple juice which in many cases improves the consistency of the jelly, for some fruits as strawberries and cherries do not make satisfactory jelly without the addition of some other fruit containing more acid. The proportion of the juices combined might be varied to suit the circumstances. One third raspberry to two thirds apple juice gives a jelly of strong raspberry flavor.

Principal Points to remember in Jelly Making:

1 (a). Put soft fruit into a saucepan, crush with a masher and let heat slowly; when hot throughout, drain in a bag then press out juice or add water to pulp and make one or two more extractions.

(b) Cover hard fruits as apples, quinces and plums in water and cook until soft. The skins, seeds and stones give color and flavor to the jelly and should be retained. When soft drain. The core of quinces contains a gummy substance that makes its use impracticable.*

2. Heat juice to boiling point, then can it or boil a certain length of time, add sugar and boil to jelly.

3. Skim and store in sterilized glasses. When cold it is usually covered with melted paraffin.

The proportion of sugar to juice is three-fourths as much sugar as juice for apples and quinces, and equal quantities for most other fruits. This means the measure of the fruit juice which has been strained through bag.

* Note. It is better to keep the juice that drains through the bag separate from other extractions as it is a much clearer jelly.

❖

Before whipping cream add the white of a fresh egg. In less time and with thinner cream you can make excellent whipped cream.

❖

If pecans are boiled five minutes before shelling the meats will come out like walnuts and with as little effort.

❖

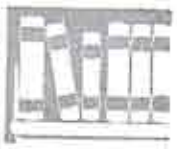
The demonstrators would be pleased to suggest menus for luncheons, parties, etc.,—and also to furnish special recipes.

Husband and wife looking at the gas demonstration food display in north window.

Husband: Don't see why you can't get up a meal like that.

Wife: Well, if I had a gas range I could.

Auditing



Monthly Report on New Business

Net Increase in Consumers in First Six Months of 1916

	Dec. 31, 1915	June 30, 1916	Increase
Gas	69,090	70,702	1,612
Electric	19,664	20,821	1,157
Steam	41	43	2
	88,795	91,566	2,771

Net Increase in Consumers in Twelve Months Ending June 30, 1916

	June 30, 1915	June 30, 1916	Increase
Gas	68,435	70,702	2,267
Electric	18,081	20,821	2,740
Steam	35	43	8
	86,551	91,566	5,015

Statement of Consumers by Departments as of June 30th

June 30th	Gas	Electric	Steam	Total	Increase each yr.
1908	38,566	5,473	....	44,039	
1909	42,422	5,957	....	48,379	4,340
1910	47,378	6,992	....	54,370	5,991
1911	52,602	8,310	16	60,928	6,558
1912	56,851	10,118	19	66,988	60,60
1913	62,021	12,838	21	74,880	7,892
1914	65,785	14,964	28	80,777	5,897
1915	68,435	18,081	35	86,551	5,774
1916	70,702	20,821	43	91,566	5,015
Inc. in 8 Yrs.	32,136	15,348	43		47,527

Increase in Consumers by Months

	1914	1915	1916
Increase in January	228	364	252
Increase in February	231	144	219
Increase in March	281	247	317
Increase in April	469	460	654
Increase in May	564	306	716
Increase in June	451	544	613
	2,224	2,065	2,771

Company's Savings Depositors

STATEMENT TO AUGUST 1st, 1916

No. of depositors July 1, 1916	73
Increase during July, 1916	1
Amount deposited August 1, 1916	598.17
Increase during July, 1916	10.67

Miscellaneous Data

	June 30, 1915	June 30, 1916	Increase
Miles of Gas Main	426	436	10
Miles of Underground Cable	995	1,043	48
Miles of Overhead Line	16,77	1,782	105
Miles of Subway Duct	870	925	55
No. of Street Arc Lights	4,352	4,141	(Dec.) 211
No. of Street Incandescent Lights	3,800	4,625	825
Total No. Street Lamps	8,152	8,766	614
No. of Employees	1,099	1,197	98
Amt of Payroll (Mo.)	$83,571.86	$97,206.77	$13,634.91

Employees' Benevolent Association

Statement of July 31, 1916

Receipts		
Cash bal. 1st of month		$4,050.83
Dues—Members	$479.14	
Dues—Company	479.14	
Fees—Members	10.00	
Fees—Company	10.00	
Assessment No. 3—Mem.	24.75	
Assessment No. 3—Comp.	24.75	
Group Life Insurance	13.59	
Int. on inv. and bank bal.	25.00	1,066.37
		$5,117.20
Disbursements		
Sick benefits	$321.34	
Accidents on duty	64.50	
Death ben.—Nat. causes	126.00	
Members' add'l life ins.	3.39	
Medical Examiner's Exp.	21.00	
Group Life Ins.	43.34	579.57
Cash Bal. on hand July 31, 1916		$4,537.63

Membership

June 31, 1916	744
Affiliated during July	8
Unaffiliated during July	2
No. of members July 31, 1916	750

Sales

Ward Baking Company Uses Forty Electric Trucks

The Ward Baking Company, Murray and Texas Streets, has just put in operation twenty new electric trucks. These trucks are 750-pound, Ward Specials, equipped with 65-cell Edison G-4 batteries. The battery used is an improvement over the old Type A battery in that it has lower internal resistance and consequently better efficiency and more constant voltage on discharge. Approximately ten Ford cars were tried on some of the longer routes for a period of two years. The high cost of gasoline, high repair bills, and tire trouble soon showed the gasoline car to be unsuited for delivering bread in competition with the electric truck. The Ford cars were gradually sold, so that at the present time the Ward Company has in operation one Ford and forty electric vehicles delivering bread in and around Rochester.

As the cut shows, the motor drives the truck through a propeller shaft and helical gears at the rear axle which is equipped with Limken bearings. With a load of 750 pounds of merchandise the truck has a radius of 45 miles per charge at a speed of ten miles an hour. On a test run, no stop except as required by traffic rules, one of these Ward Specials equipped with Edison batteries went 90 miles on one charge.

The vehicles are charged between the hours of 5 P. M. and 3 A. M.

Type of Electric Truck Used by Ward Baking Company

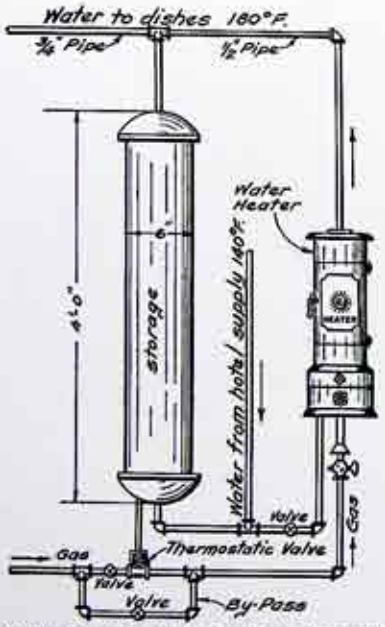
Automatic Control of Rinsing Water Temperature

BY LEO J. SULLIVAN

The necessity of hot water for rinsing dishes and glassware at the Hotel Richford is responsible for the installation of the appliances shown on the accompanying cut.

A temperature of 140 degrees Fahrenheit for hot water from the hotel supply is not high enough to give good results, so some simple device had to be used to raise this temperature, provide sufficient storage capacity and to automatically control the temperature.

The apparatus shown consists of a domestic gas-fired water heater, a piece of 6-inch wrought iron pipe capped at both ends for a storage tank, and a thermostatic valve to regulate the gas supplied to the heater. When the valve at the rinsing machine is closed the water from the storage tank passes through the heater where its temperature is raised 40 degrees, and then back to the tank. The raising of the temperature of the water causes this continuous circulation from tank through heater and back to its original source. When the temperature throughout the tank has reached 180 degrees, the thermostatic valve inserted in the bottom of the tank and connected to the gas line, will automatically cut off the gas supply and remain off until the temperature in the tank falls below the required value. The pilot light supplied through the by-pass makes its operation perfectly safe. When the outlet to the dish-washing machine is open, the hot water is supplied by the storage tank rather than the heater, because the pipe from the tank is larger and offers less resistance to the flow. Relatively cool water then takes the place of the hot water in the tank and causes the thermostat to open the gas valve, thus furnishing the necessary heat to replenish the hot water supply This apparatus has proven entirely satisfactory and gives sufficient hot water at a minimum consumption of gas.



Automatically Controlled Hot Water Apparatus Installed at Hotel Richford

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The Shinola Company of No. 8 Jay Street, which manufactures shoe polishes and the necessary brushes and polishers, recently decided to purchase from the Rochester Railway and Light Company all the steam and electricity required by its plant. Owing to the fact that at present the Company's high pressure steam main extends only to the Rochester Candy Works on State Street, it will be necessary to run a main from the Candy Works to the Shinola Company. When this main is completed—probably by the last of September—a load of 25 kilowatts of electricity, with a yearly consumption of 4700 kilowatt hours, and a steam load of approximately 5,000,000 pounds per year, will be supplied by this Company. This change will mean that the Shinola Company will permanently shut down its power plant which was installed in 1909 and which consists of an 85 horsepower boiler and a 30 kilowatt direct connected engine generator.

❖

The accompanying illustration shows one of the Company's double drum electric hoists set up, wired, and ready for work. Either drum is capable of a 4000 pound pull at a speed of 250 feet per minute. The extreme simplicity of the wiring required should be noted.

As compared with a steam hoist, the control is very simple and the operator can devote all his time to running the hoist rather than spending considerable time as a fireman and coal handler. Smoke, heat, fire and danger of explosion are eliminated, thereby doing away with the most objectionable features of the steam hoist. The cost of operation is very low and the depreciation due to use is slight.

❖

Several years' use of electric power—one month's use of an oil engine, and then electric power again. Such is the history of the kind of power used at the stone crushing and screening plant of the Rochester Vulcanite Paving Company. The 25-H. P. crude oil engine which was installed this spring could not stand the severe service required of it and broke down so frequently that it was replaced with an electric motor.

❖

Messrs. William and Charles H. Carson, stone contractors in Rochester have replaced the gasoline engine operating the machinery at their Plymouth Avenue plant, with a 25 horsepower electric motor. The motor drives a planer for planing stone and an air compressor for chipping.

Double Drum Electric Hoist

❖

The Despatch Heat, Light and Power Company has connected three transformers in parallel with the 3-50 KW transformers located in the Victor Milling Company's plant. The Milling Company has increased its capacity from 350 bbl. to 500 bbl.

❖

A. J. Vetter owner of the Public Market Restaurant has added one more Hotel Range Section to his kitchen equipment. Business is growing.

❖

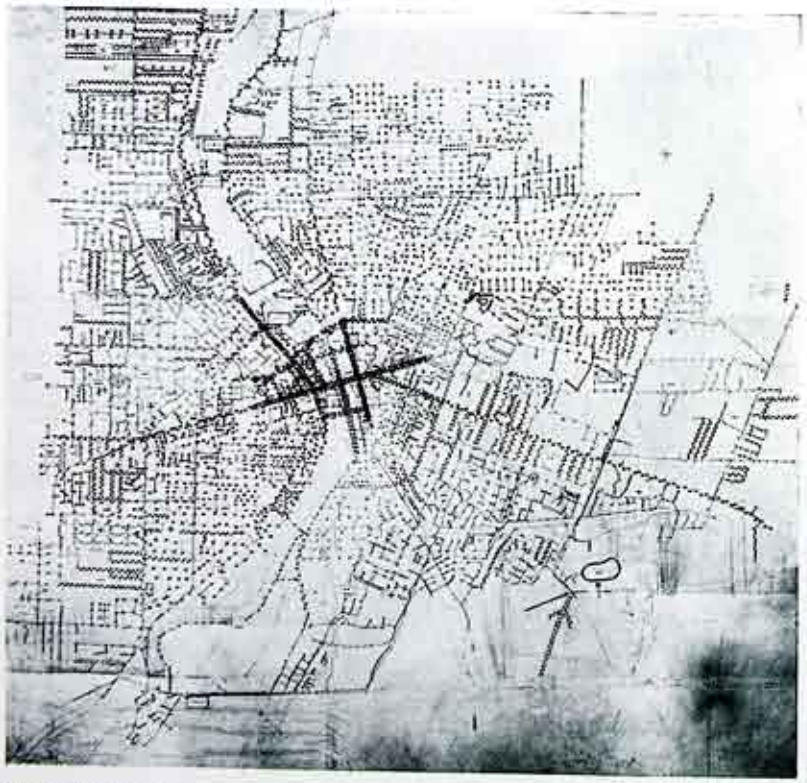
The Monroe County Jail has purchased a Gas Pastry Oven having a capacity of 36 two-pound loaves an hour.

Electric Distribution

Reconstructing the Street Lighting System

BY J. O. MONTIGNANI

A few months ago when the management decided to remove from the street lighting system all of the old type enclosed 7½ ampere arc lamps, and replace them with 600 c. p. high efficiency Mazda lamps, a study was made of the system to determine how the circuits could be re-routed to place to the best advantage the increased number of lamps which could be operated from the constant-current transformers in the stations. As only two-thirds as much energy will be required under the new system, the problem involved the withdrawal from service of one-third of the transformers and a large amount of feeder wire and cable. As a help, and in order to best visualize the system as a whole, a large map of the city was prepared on a scale of 300 feet to the inch, and mounted on a large pine board. Then the lamps of various sizes and types were represented by colored tacks which were set at each point where a lamp is located. The new circuits were then laid out by first assigning to each station or sub-station that territory which the station could serve most economically. Colored threads representing the wiring, were then run to various groups of lamps forming the circuits. Each circuit was designed for a load of about 85% of its transformer capacity, 15% capacity being reserved for possible future additional load.



Board with 9000 tacks to represent lamps on Rochester's street lighting system. Colored string used to show circuits. Original board is about 8 feet square.

By this method of laying out the circuits the minimum amount of wire and cable necessary to complete the system was arrived at, and maps of the individual circuits were drawn and furnished to the Line Department to carry out the work of reconstruction.

An idea of the saving in wire and cable which will be accomplished when the work is completed will be gained from the following figures:

Number of feet of wire in old arrangement of circuits:	
Overhead	2,406,980
Underground	1,738,250
Total	4,145,230
Number feet of wire in new arrangement of circuits:	
Overhead	1,577,530
Underground	1,287,300
Total	2,864,830
Saving in overhead wire by new arrangement	829,450 ft.
Saving in underground wire by new arrangement	450,950 ft.
Total saving	1,280,400 ft.

=242+ miles.

The writer received able assistance in the above study from James Wishart of the Drafting Department to whom was assigned much of the detail work and mapping. George Wetzel is directing the work in the field and now has it well under way.

The men of the Distribution Department have erected an additional circuit to the Lake Ontario Water Company's plant on the Fleming Road. This circuit connects with circuit No. 425 at the Latta Road and Charlotte Branch of the B. R. & P. R. R., and was installed for the purpose of eliminating interruptions in case of trouble at the Charlotte Sub-Station Burke horngap air break. The eleven thousand volt switches which have been erected on both lines at the Lake Ontario Water Company's plant are mechanically connected and operated by lever arms so that by opening one set of switches, the operator automatically closes the other thus entirely eliminating the possibility of having both sets of switches in contact at the same time.

❖

The Distribution Department is erecting four steel towers south of Station 33 on the 60,000 volt Niagara transmission line. These towers will be erected midway between the present towers and will be used to support the span, thus eliminating the possibility of the conductors swinging and grounding on the Western Union telegraph wires which occupy the east side of the Lehigh Valley Right of Way.

❖

Under the supervision of Mr. J. Cox, men from the Line Department are dismantling and removing the steel towers of the former 11,000 volt Kerbaugh line emanating from the Rochester and Eastern sub-station at Pittsford and following the Barge Canal right of way to Macedon.

Gas Manufacture

Problem of Boiler Feed Water at No. 10 Holder

The boilers at No. 10 Holder are supplied with feed water taken from the holder tank. This tank was originally filled with impounded water from the small creek which traverses the Holder site. It contains approximately ten million gallons of water and although considerable quantities are withdrawn each year for boiler purposes, it is not necessary to add fresh water to the tank. The melting snows in the winter, the rains in spring and fall, and the constant addition of some condensate from the gas is sufficient to maintain the necessary tankage. A sample of this water was recently submitted to the Traveler's Indemnity Co. for its analysis on the basis of boiler serviceability. The following is their report:

Total solids	2.33
(in 10,000 parts of water)	
Silica	.03
Oxides Iron and Alumina	.02
Calcium sulphate	.85
Calcium carbonate	.80
Alkali chlorides	.44
Magnesium Carbonate	.19

While this analysis shows that the water is not perfection for boiler use owing to the relatively large proportions of carbonates and sulphates of calcium and magnesium, yet it offers a most agreeable contrast to some waters which are forced to serve as boiler supplies.

The re-agents necessary to soften the water are given as follows in the report; 3½ ozs. 58% soda ash, and 1 oz. commercial lime to 350 gallons of water.

During the period of operation in the season of 1915-1916 approximately one and one-quarter million gallons of water was used in the boilers. No particularly troublesome features have developed, except for a peculiar corrosion or pitting on the water pan. It was at first thought to be due to electrolytic action but failed to prove out on test. The next alternative was to look for the trouble in the water, but this analysis hardly seems to bear that out. A further cause is being sought for.

❖

Mr. Haftenkamp was in Philadelphia recently, in connection with Station B. While there he inspected a machine which has been developed to automatically run a water gas machine. All that is necessary is to put in the coal and shut the lid, and the machine will do the rest—every detail and contingency is taken care of. Mr. Haftenkamp says it is a beautiful piece of hydraulically controlled mechanism.

❖

Two tests have been run on the Thomas Electric Gas Meter. The first on June 16th with the meter preheater in service showed the meter to be eight per cent slow. The second test on June 23rd with the preheater cut out, indicated that the meter was only 1.9 per cent slow.

❖

A contract has been placed with the Asbestos Protected Metal Company to remove the present slate roof from No. 1 Boiler room and No. 1 Water Gas Generator building at the Gas Works, and replace them with patented asbestos protected metal roofing.

Gas Distribution

The enormous amount of pipe—exclusive of services—used by this Company to distribute gas throughout the city, is shown by the following figures. This is enough pipe to reach twenty miles beyond Boston from Rochester.

Size Main	Feet	Miles
2", 2½", and 3"	266,440	50.46
4"	808,869	153.195
6"	949,920	179.9
8"	180,698	34.223
10"	63,035	11.94
12"	57,873	10.96
16"	22,435	4.25
20"	5,295	1.003
24"	326	.061
30"	.665	.126
Total	2,355,425	446.103

❖

The installation of gas main crossovers and service stubs on Thurston Road is rapidly nearing completion. Before a street is paved it is necessary for the Street Department to see that all intersecting streets are provided with a main connection, and that all vacant lots will have a service lateral or stub in front of same in order that it will not be necessary to disturb the new improvement. In addition to this, all main joints must be "needled" to determine leaks, and all services must be examined as to size and the condition of the pipe. All ¾" and 1" services are renewed, while those of 1¼" and 1½" diameter are allowed to remain as they are because as a rule they are in good condition, having been installed within the past ten years.

❖

In order to properly cook the food that is served to the 500 tars that regularly spend Saturday and Sunday at the Naval Militia Armory at Summerville, a 2½" gas service, one hundred and forty-five feet long has been installed. Considerable difficulty was encountered in trenching on account of the proximity of the trench to the river where the water level is unusually high.

❖

The new gas trenches at East Rochester were placarded for "Park Day" with cloth bulletins reading, "This pipe will carry gas to East Rochester." The Pittsford Board of Trade started a merry rivalry by posting the same trench with several signs reading "Gas for Pittsford, the most beautiful residence town in New York State."

❖

The Transportation Department has to take care of many large deliveries of material. Among the recent deliveries of the department was the hauling of 1600 barrels of cement from the R. W. & O. R. R. siding on Conkey Avenue to Station 5.

❖

A 2" gas service fifty three feet long, has been installed in Mason's Best Yet Laundry on Dewey Ave. This is further evidence that laundry companies throughout the city are rapidly recognizing the advantages of city gas as a fuel.

❖

The Transportation Department is now experimenting with four wheeled motorcycles. It is expected that the extra wheels will cut down the vibration and make riding much easier.

A young couple went to a minister's house to get married. After the ceremony the bridegroom drew the clergyman aside and said in a whisper:

"I'm sorry I have no money to pay your fee, but if you'll take me down into the cellar I'll show you how to fix your gas meter so that it won't register."

Engineering and Construction

Progress at Station No. 5

The accompanying pictures give some idea of the progress of the work on August 4th. Figure 1 shows the first step in excavating the riser to the surge tank. This shaft, 22 feet in diameter, starts from the arrow in figure 2, and goes down about 100 feet to connect with the tunnel directly below. This excavating work has been completed.

The outlet of the tunnel which will be horseshoe shaped and have the equivalent area of a circle 20 feet in diameter, is shown in figure 2.

The steam shovels are excavating earth in order to make room for the new building which will extend from the cliff and join the old building at an angle, at the center pilaster. The coffer dam shown, was built to make it possible to work on the portion of the new building which will rest there, and also to excavate the tail race.

In figure 3 is shown the coffer dam at Station 15, where the intake house will be located. The tunnel will start at this point, go down about 100 feet, and then gradually slope to the outlet 1600 feet away, shown in figure 2. The dam, made up of taintor and sector gates will run across the river at this point.

Starting with the next issue, the various interesting features involved in this work, will be described in detail.

Fig. 1. Starting excavation for riser to surge tank. Shaft about 22 feet in diameter, and 100 feet deep to tunnel below.

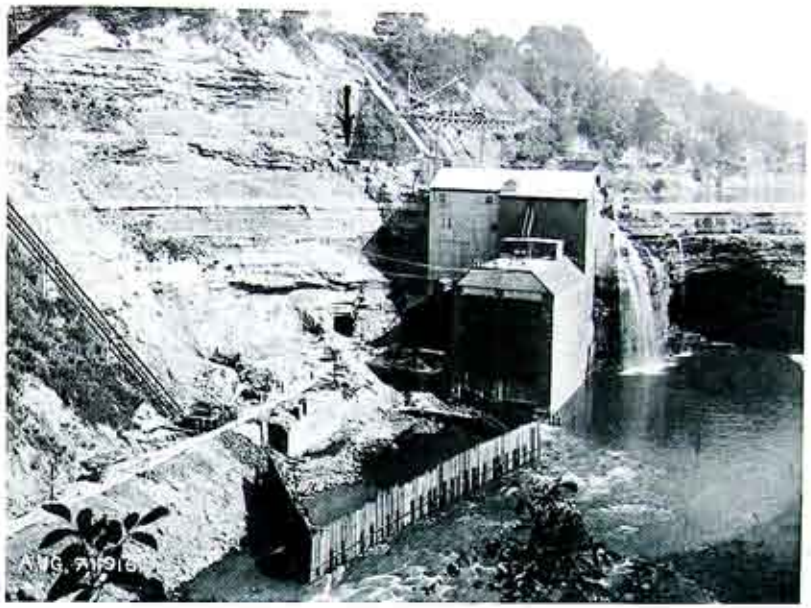


Fig. 2. Station 5 showing outlet of tunnel. Arrow shows location of surge tank. Coffer dam built to permit work on new building and tail race.

Fig. 3. Coffer dam at Station 15, where intake house will be located. Tunnel will start here and run about 1500 feet north to outlet at Station 5, shown in Fig. 2.

Hydraulic Sluicing Work at Station B

BY J. P. HAFTENKAMP

The property where Station B is being built is bisected lengthwise by a road which was formerly known as Falls Street, paralleling the Genesee River. From Falls Street east the land slopes to the river and makes a depression so low that a retaining wall had to be built along the river bank. As shown in the accompanying picture, to the west of the street is a steep embankment which is the result of the use of the property as a general dumping ground. The large pile of stone on top of the dump was taken from the recent city sewer work.

The embankment represents approximately 80,000 cubic yards of material which must be removed; about half of this material will be required to make the proper backfill on the stretch between the road and the retaining wall. The expense of moving this earth at even a very low cost of $.25 per yard would amount to $20,000; in fact it is a question whether steam shovels and trams could do it at that price. The only readily available method was to sluice, or hydraulically wash this earth hill to the locations where it is needed.

The problem of obtaining the very high water pressure required for this method was solved by converting the six-inch steam line shown in picture, which emanates from Station 3, to a high pressure water line, by attaching it to one of the centrifugal boiler feed pumps at Station 3. Wooden sluice ways were built, and with water furnished at 150 pounds pressure the washing process was carried on as shown in Figure 2. The one hose washes the material down, and the second hose forces it through the sluice boxes to the desired points. This work was continued across the face of the embankment until the stone was undermined and slid down, thus forming a heavy curtain over the loose earth, and preventing any further or rapid progress. The only solution was to remove the rock, and this is now being done by the steam shovel which is shown removing sufficient earth to permit the completion of the Retort House foundation.

Station B. Site. Hill at left to be washed onto the low ground toward River at right of picture.

Fig. 2. Hydraulic Sluicing at Station B; water under 150 pounds pressure

Personals

Have you forgotten that the prize paper contest closes September 1st? There is an opportunity for you to win a $15.00 first prize or a $10.00 second prize. These monetary prizes are given to the winners of six different groups. You belong to one of these groups—you have ideas—you can write. The Drafting Department will, upon request, assist you in making illustrative sketches. Do it now—it's the man with initiative and originality who gets ahead.

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Mr. C. B. Lerkins of Sta. 15, is having a happy time at Penn Yan.

Mr. Charles Whelan was in Philadelphia recently in connection with the work at Station 5.

Mr. Arthur Hooper of the Drafting Department is spending his vacation in Rochester and vicinity.

Mr. Irving Milow has returned from a pleasant trip which included Buffalo, Detroit and Chicago.

Miss Elizabeth Gorst, of the Meter Reading Department, is attending a house party at Silver Lake, N. Y.

Mr. James Platt, of the Order Department, has been transferred to the Collection Department.

Mr. J. P. Doyle of Station 6 spent his vacation in Rochester and vicinity.

Mr. A. J. Johnson, operator at Sta. 15, is enjoying a two weeks' vacation at Holley.

Mr. and Mrs. William H. Earle spent a week at Thousand Island Park early in July.

Mr. James Donlon was presented with a fine baby boy on Friday, July 21st.

Mr. F. W. Pierce of the Line Department has returned from a two weeks vacation at the Ponds.

Mr. Frank Herring of the Gas Street Department is spending a restful vacation at Batavia.

Mr. F. B. Odell, operator at Station 35, will spend his vacation at Conesus Lake this year.

Mr. Martin Quinn of the Gas Shop visited his home at Port Byron a few days during his recent vacation.

Mr. Switzer, of the Billing Group, is spending his vacation at Oswego, New York.

Mr. A. M. Beebee recently attended a week-end house party at Menter Island, Thousand Islands.

Vice-President, R. M. Searle is away for a two weeks' motor trip through the White Mountains.

Assistant Foreman, Edward Yakey, of the Gas Works, spent his vacation in Fairport.

Mr. H. Nichols of the Domestic Sales Department reports some pleasant sailing trips recently on the Yacht "Drake."

Miss Minna Stroh left August 5th for the Y. W. C. A. vacation house

at Canandaigua Lake, for a week's vacation.

Mr. Walter Slobbe of the Domestic Sales Department reports that fishing and pursuing burglars at Summerville is great sport.

Mr. Maurice Owen has been engaged in the Auditing Department, to take the place of Mr. F. A. DeWaters.

Mr. Walter Tanner, of the Addressograph Department, spent his two week's vacation at "Sleepy Hollow," Sea Breeze.

Mr. Norman H. Goldworthy has been employed at No. 6 Station as switchboard helper to take Mr. R. Howard's place.

Mr. Donie of the Service Improvement Dept., is spending two weeks on a farm as far away from complaints as possible.

Mr. Stanley V. Van Riper is in charge of the clerical and office work at Station B. Mr. Van Riper is a graduate of Mechanics Institute.

Mr. Gosnell, Paymaster and Supt. of the E. B. A., and family, are enjoying themselves at Grand View Beach on Lake Ontario.

Mr. Frank G. Lindsay is the proud father of a nine pound baby girl which arrived Friday morning, July 21st.

Messrs. F. J. Howes, F. W. Fisher and E. R. Crofts were at Niagara Falls recently inspecting the concrete surge tank installed there.

Miss Mae Custin of the Engineering Department is spending a happy vacation visiting relatives in Cleveland and Indianapolis.

Mr. Ellison, crane operator at Station 3, is substitute operator at Station 34 while the operators take their vacations.

Mr. Claude Adams has returned from a two weeks' vacation spent near Corning, N. Y. Claude looks as though the farm life agreed with him.

Miss L. B. Ross, formerly of the Employment Department, has been transferred to the Purchasing Department.

Mr. George E. Mabie and family are taking a vacation trip through northern New York and the St. Lawrence district.

Mr. Bushnell, operator at Station 34, is spending his happy vacation days in good old Rochester and vicinity.

Mr. Raymond Murphy and Mr. Sol Isbitz have been engaged in the Addressograph and Printing Department.

Mr. Harris Bates of Station 4 is spending his vacation at Atlantic City flirting with the man-eating sharks.

Mr. Sydney Swanson, Line Foreman of the Despatch Company, has returned from a two weeks visit at his home in Illinois.

Mr. Charles Sheldon of Station 4 spent a two weeks' vacation in Canada recently, and he reports a good time.

General Manager J. T. Hutchings and family left August 4, for a ten days motor trip through the White Mts.

Mr. Harry Goodland and Mr. J. B. Doyle of Station 6 have both been missing from the Station recently. A happy vacation is the cause.

Mr. W. Briars has been engaged in the Auditing Department to fill the position vacated by Mr. B. Seymour, who has gone with the National Guard to Texas.

Mr. Wm. F. Morris, operator at Station 15, is enjoying a two weeks' vacation at Jersey City. The seashore has many attractions these warm days.

Assistant General Manager Herman Russell was in Philadelphia August 9th in connection with the work at the new gas plant—Station B.

Mr. Wm. Johnston of Station 4, has returned from a two weeks stay at Palm Beach. Mr. Johnstons only

regret was that two weeks didn't extend over a longer period of time.

Mr. George Eisenbaum of the Electric Meter Department had an operation for appendicitis recently. It is reported that Mr. Eisenbaum is recovering very rapidly.

Mr. Frederick Gunther, of the Gas Works, attended the festivities of Shrine Week in Buffalo, and the following week he pitched hay on the farm.

We have received a communication from Allen Stephenson who is on border duty in Texas, and he says, "Everybody is in fine shape."

Mr. J. Warren Lyons, of the Engineering Department, has been spending several days of his vacation in the higher and cooler altitudes of the Adirondacks.

Mr. Richard Howard formerly of Station 6, has resigned as assistant operator to accept a position as traveling salesman for the Metalcraft Company of Rochester.

Mr. Ray Ernst of Station 4 returned from a two weeks' vacation in Buffalo. It was a real vacation—'tis said that Ray gained about fifty pounds.

Mr. C. P. Martin of the Line Department has fully recovered from a fall which occurred while he was working on a church roof on St. Paul Street.

Mr. Elmer Forrest, Assistant to Mr. Banks in the storehouse has just returned from an enjoyable trip on the Great Lakes. Cleveland and Buffalo were among the cities visited.

Mr. A. D. Rees, Foreman at Station 2A, expects to motor to Clayton and the Thousand Islands where he will spend part of his vacation visiting his old home.

The Editors have a few extra copies of the March, May, June and July issues, which they would be glad to give to the new employees who desire them.

Mr. John Weyl, office assistant of the Industrial-Engineering Department spent his vacation "camping out." John looks as though life in the open is very beneficial.

Miss Irene McDermott of the Collection Department, had her tonsils removed. She is, at present, in St. Mary's hospital recovering from the operation.

Mr. Howard Harding of the Engineering Department decided that the hot rainless days of July were just the time to take his two weeks vacation.

Mr. J. P. MacSweeney and Mr. H. C. Marquardt of the Domestic Sales Department take this means of thanking all those who so generously became members of the Red Cross.

Mr. Fred Boheen, operator at Station 35 received a broken wrist recently. Mr. Boheen was struck by an automobile while riding his motor cycle down West Main Street.

Mr. A. Reamer of the Domestic Sales Department has spent several of his recent week-ends at Sodus Point. The cool water felt fine during the hot sultry days.

Mr. W. J. Brown of the Domestic Sales Department has been ill and in a very weak condition for some time. We extend out best wishes for a rapid recovery.

Mr. A. Erkstein of No. 3 Station has been added to the operating force at 35 Station. Mr. Erkstein was formally employed by the Utz & Dunn Company.

Mr. Walter Drew, Assistant Gas Shop foreman, has left for a two week's auto trip through New York State. Mr. Drew ought to have many interesting experiences to tell after he returns.

Miss Marie Skinner of the Engineering Department, is spending her vacation at Newark Island in Sodus Bay. Hot sun, fishing, swimming, walking and boating ought to make an ideal vacation.

The Electrical Day Outing was a decided success. Reports show that the good ship Ontario carried over 220 Jovians, friends and members of families who were bubbling over with mirth and jollity.

Mr. H. Ketchum, of Station 2, spent one week in Buffalo and a week at the Bay enjoying his vacation. Upon his return the boys were expecting to hear of many large fish, and also of fast motor boat races.

General Manager J. T. Hutchings was one of a committee of three judges who selected the winners in the Eastman Kodak's Contest, "What the Eastman Wage Dividend has meant to Me."

Mr. Harold S. Crawford has been employed on construction work at Station B. Mr. Crawford is a graduate of Denison University and has been associated with Mr. W. R. Storey, C. E.

Mr. T. D. Weaver, who for a short time was employed in the Industrial Department, has left to accept a position as Efficiency Engineer with the Studebaker Corporation, of Detroit, Michigan.

Mr. George H. Kieffer, operator at Station 15, and Miss Dorette C. Fahrer of 114 Morrill Street, were married on Tuesday, June 27. After a very pleasant two weeks trip Mr. and Mrs. Kieffer returned to the Morrill St. home.

We have received a postal from Mr. F. A. Miller who was at Skagway, Alaska. He wrote as follows: "Alaska towns are 500 miles from nowhere. Glaciers innumerable and room for 100 'Thousand Islands.' Scenery the finest."

Judging from the large bouquets of beautiful flowers that Assistant Treasurer C. A. Tucker brings to the office for distribution, we would say that he is as efficient and successful at gardening as he is at watching the doors of the treasury.

Mr. J. P. MacSweeney had both arms and shoulders burned recently by the unthinking sun. "Mac" said that everyone insisted on leaning against those sore arms. The only friend he had was Improved Carron Oil.

Miss Anna M. Waldron and Mr. Stanley L. Empey of the Electric Meter Department, will be married on August 18th, at the Church of Epiphany. After a trip through Canada, Mr. and Mrs. Empey will be at home at 243 Hawley St.

Mr. William Hummell, of the Gas Works, spent the greater part of his vacation in and near Canandaigua. He reports that Mrs. Hummell continues to improve in health, and expects to leave the Sanitarium in September.

A recent case of electrocution, caused by the fisherman's rod coming in contact with a high tension wire near a power house, shows that it pays to be careful with ones fishing rod when angling near low electric transmission lines, or near electric power houses built along the streams.

Mr. Ivar Lundgaard, Manager of the Industrial Sales Dept., was called upon by President Andrews to investigate and report on the merits of a proposed private plant for the 54th and 55th Street Buildings of the Automobile Club of America in New York. Mr. Lundgaard made two trips to New York to get the necessary data previous to submitting his report.

The Rochester Naval Militiamen returned to Rochester Sunday, July 30th, from their annual two-week cruise. The cruise is said to have been the most instructive and most impressive the Rochester boys have had. The Rochester divisions numbered 107 men and seven officers. This Company's men are ever alert and are to be found in many organizations. Fourteen are serving Uncle Sam in the army, and the three

Company Men in Naval Militia; Lieutenant R. D. DeWolf; Boatswains Mate, 1st Class, L. C. Kimpal; Seaman, J. E. McMann

shown in the accompanying picture are always ready to help man the ships of the navy. Their tanned faces and alert step indicated that the trip was a great benefit physically.

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We have received a letter from Mr. Harold Elwood who is doing border duty, and he writes in part as follows:

Just a few lines to let you know I am alive and well.

We are now pretty well settled and organized and the work is running smoothly. We are kept pretty busy, but have had very little sickness. A few men have had a little stomach and bowel trouble, but nothing serious. We have had no heat prostrations, although several of the commands have had trouble of that kind.

It has been pretty hot here and we have done a lot of hard work but we are getting pretty well hardened up.

The country around here is very flat, sandy and very little vegetation,—just a few enoti and mesquite, with no grass. There are a few rattlers and plenty of tarantulas, scorpions, centipedes and various other kinds of insects and reptiles. There is not much news to write. We have settled down to regular army routine life, which keeps us busy.

With best wishes to you and all of the boys at the office, I am

Very sincerely,
Signed—Harold M. Elwood.

2nd. Amb. Co., N. Y. Div. N. G., U. S. A., Pharr, Tex.

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Illuminating Engineering Lecture Course, September 21st to 28th, 1916, at the University of Pennsylvania, Philadelphia, Pa.

The 1916 lectures will be of great value to those interested in the design of lighting installations, whether as purchasers, salesmen, engineers, constructors, physiologists or artists. Beyond the value rendered to those fortunate individuals who attend the Course there is a broader value which is bound to be realized, the same as in the 1910 Course. The Course will have a marked influence in advancing the art of illumination. Through its influence a better standard of lighting will be secured throughout the country. Inartistic and glaring light will be strenuously condemned and misconceptions rectified. The precious power of sight will be more carefully conserved.

Deaths

It is with the utmost regret that we announce the following deaths:

Mr. Charles J. Stephany who has been a faithful employee of this Company for nearly a score of years. Mr. Stephany had charge of the fixture stock and repairing in the Gas Shop for a number of years. On April 10th he was compelled to give up his work, on account of a complication of diseases, and he was confined to his home until his death on July 19th.

Mrs. Langham, wife of Mr. B. Langham of Station 5, died July 28th, at the family residence, No. 6 Durgin St.

Mrs. Daniel Smith, wife of Mr. Smith of Sta. 26, died July 16th at St. Mary's Hospital.

Cornelius VanZwoll, 8½ months old infant son of Mr. John VanZwoll, of the Order Department, died July 24th.

The bereaved families have the deepest sympathy of the employees of this Company.

Athletics

Standings of the Clubs Aug. 6th.

	Won	Lost	P.C.
Nationals	6	3	.667
Kodak Park	6	3	.667
R. R. & L.	6	3	.667
Maltops	5	4	.556
Eagles	4	5	.444
Independents	0	9	.000

Hail to a Winning Team

As we go to press, three teams are tied for first place, and our boys have good prospects for coming out on top when the league closes in about a month.

It took Iron Man Connell to beat the hard-hitting Eagles twice in the same place, and by nearly the same score. The week before, Connell played the same trick on the Independents—two games put on ice in one day. The boys are playing air-tight ball every minute, and they are all doing their part when it comes to hammering the ball.

Below are the scores of the games played since the last issue of the magazine. The apparent inconsistent loss was due to no pitcher showing up—the catcher had to do the work.

Kodak	5	R. R. & L.	3
Maltops	10	R. R. & L.	3
R. R. & L.	6	Independents	5
R. R. & L.	9	Independents	3
R. R. & L.	7	Eagles	3
R. R. & L.	7	Eagles	1

Catcher, Ray Guppy, Captain; Pitcher, Ray Connell, the Iron Man; Mannie Freedman, First baseman.

Annex Second Buffalo Game

On Saturday August 5, the Railway and Light team and the Buffalo General Electric team, staged the second game of their series, at Searle Park. When the clouds of battle cleared away our boys emerged the victor by a score of 8 to 7.

Durbin came through with three hits, and incidentally drove in the winning run.

O'Flatterty pitched a good game for Buffalo—the game was lost, but he evened matters up by beating Mr. Scobell two games of pool.

After the game the Buffalo boys were entertained at the Rochester Club, where the members of both teams increased their friendship.

On the 26th of August a return game will be played in Buffalo, and if the score varies in the same ratio that it has in the first and second games, the Buffalo team will come out on top.

BUFFALO GEN. ELEC.	r.	h.	po.	a.	e.	ROCH. RY. & LIGHT	r.	h.	po.	a.	e.
Moore 2b	1	0	3	4	1	Guppy c	2	2	13	2	1
Tomblen 3b	1	0	2	0	0	Friedman 1b	0	2	8	0	0
O'Flat'ry p.	1	1	1	1	0	Connell cf	0	0	0	0	0
Walker lf	1	2	1	0	0	Groh ss	0	2	2	1	1
O'Den 1b	0	0	8	0	0	Habel lf	2	2	1	0	0
Nieb'gal ss	2	1	1	5	0	Davis 3b	1	1	1	4	1
Kennedy rf	0	0	0	0	0	Durbin 2b	1	3	1	0	1
Good c	1	2	10	1	4	Tyrell rf	1	0	0	0	0
Daly efs	0	1	0	0	0	Mury p	1	1	1	2	0
Totals	7	7	*26	11	5	Totals	8	13	27	9	4

*Two out when winning run was scored.

Buffalo Gen. Electric	2	1	0	0	0	0	1	2	1	—7
Roch. Ry. & Light	0	0	0	4	1	0	0	2	1	—8

Two-base hits, Walker 2, Guppy, Groh, Habel, Durbin 2, Mury; home run, Good; sacrifice hits, Tomblen; first base on balls, off Mury 1, off O'Flatterty 4; hit by pitched ball, by Mury 1 (Moore); struck out, by Mury 11, O'Flatterty 8; umpire, Bergen; time, 2:05.

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The tennis enthusiasts have not been out a great deal during the hot spell. Several interesting tennis tournaments ought to be held sometime in the near future. Do you play tennis?