GAS AND ELECTRIC NEWS

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See page 37
Coal Byproducts
Cable

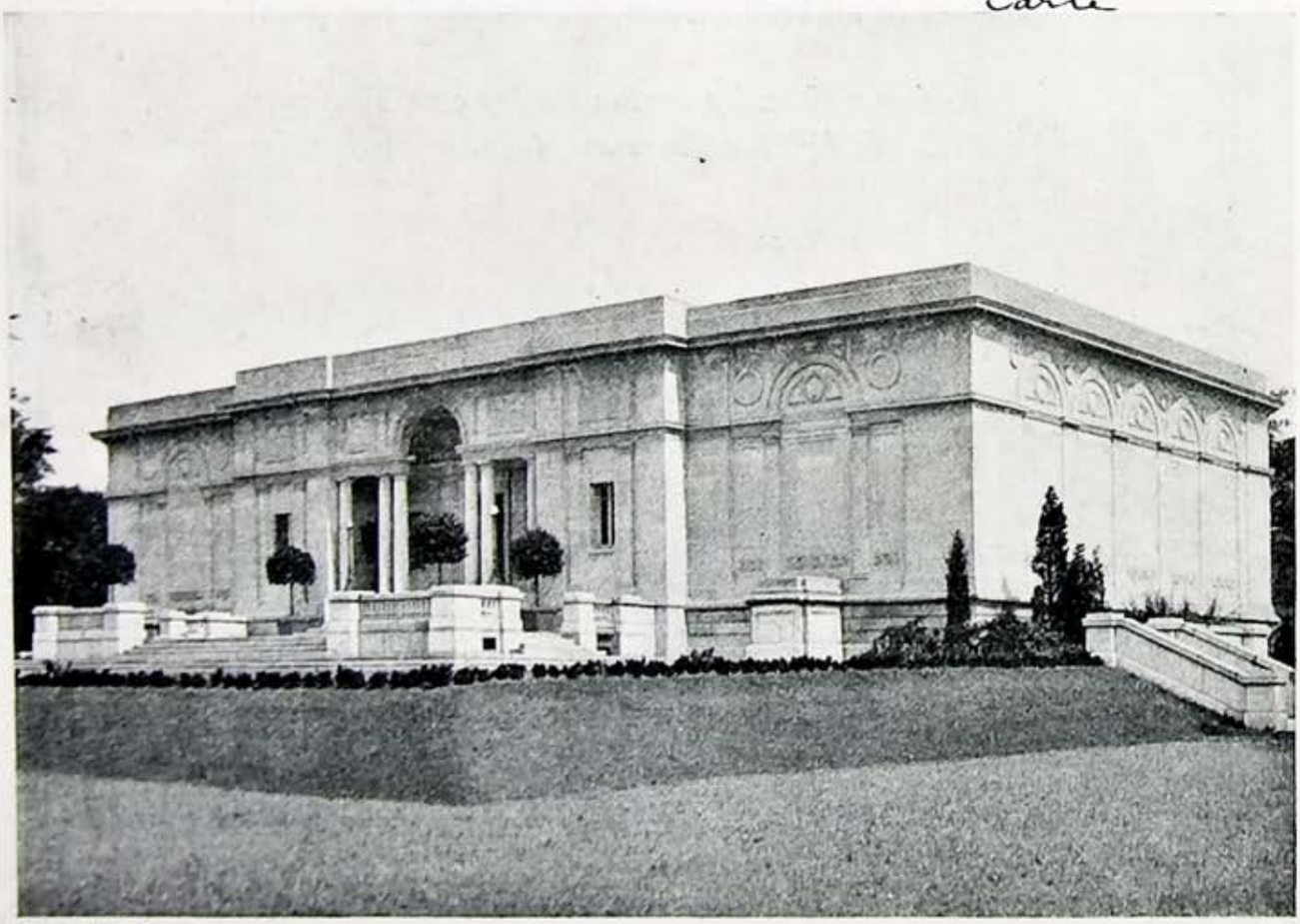


Photo by Stone
Herald Photographer

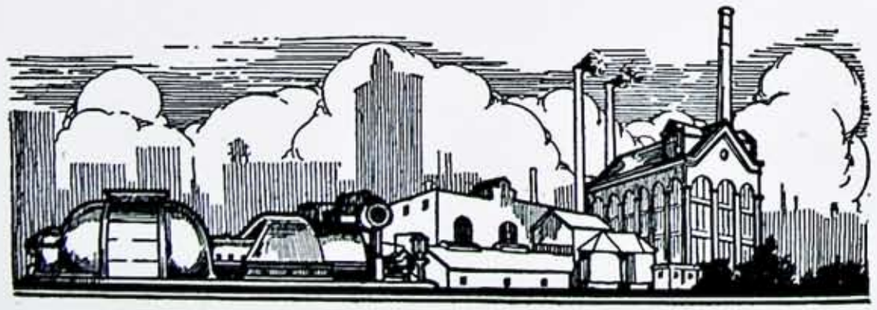
Rochester Series—Memorial Art Gallery

"THEY SHALL NOT PASS!"

"They shall not pass! In dugout and in trench
The phrase was mustered as the poilus fought.
The earth and sky were but a shambles, fraught
With gas and bursting shells and with the drench
Of shrapnel. Yet, in all the battle-stench.
'Mid horror heaped on horror past all thought
The thin line stood. A miracle was wrought;
They could not break the Will that held the French.

Each human soul must meet its own Verdun,
That crisis when the armies of despair
Attack the fortress in a serried mass:
Not by brute strength may this great fight be won,
But only by the Will that can declare
In face of all Hell's hosts, "They shall not pass!"

A poem written by Berton Braley on "Thoughts Aroused by the German Offensive Against Verdun."



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Steel Heat Treating Temperatures

SAMUEL J. COHEN

STEEL MAY be defined as an alloy of iron and carbon, containing enough carbon so that it will harden on quenching and will be malleable through a certain temperature range. The upper limit is rated at about 2% carbon and the lower with a few hundredths of 1% of carbon.

Commercial steels contain many impurities, as sulphur, phosphorous, silicon and manganese, the effects of which will not be taken up here, as for the purpose of studying the principles underlying the problem of heat treating, we may consider steel a pure alloy of iron and carbon.

A section of steel may be bored out so that a small thermo-couple can be inserted and the steel may then be heated to a bright cherry red and allowed to cool very slowly in the furnace. If temperature readings are taken at equal intervals of time until the steel is cold and the temperature is plotted against the time, the result will be a curve similar to that of Fig. 2, which is the cooling curve of pure iron. Temperatures corresponding to flat portions of the curve are termed "critical points." At these points there has evidently been a change of some kind resulting in an evolution of heat. This change consists in an allotropic modification of the iron and the

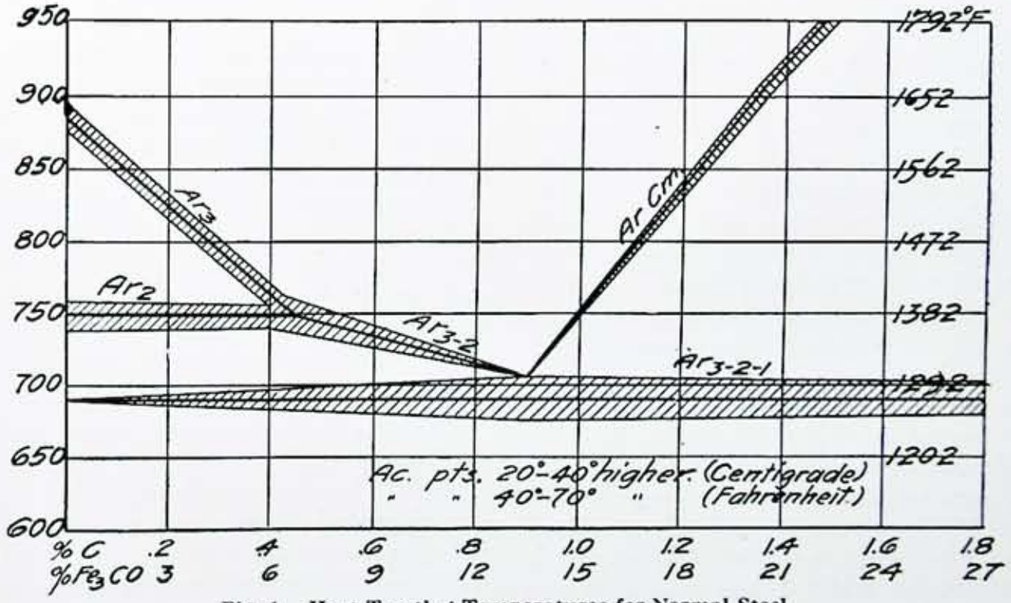


Fig. 1. Heat Treating Temperatures for Normal Steel.

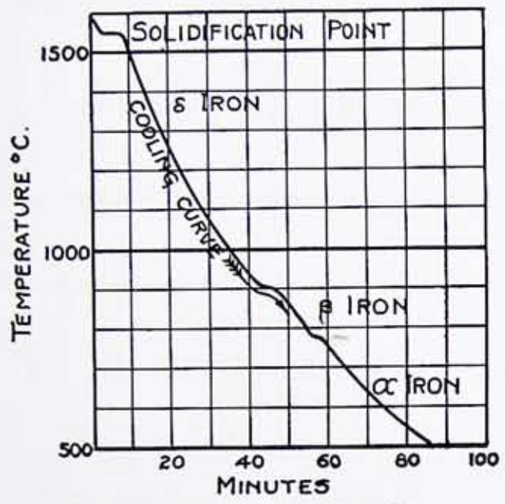


Fig. 2. Cooling Curve of Pure Iron

effect of carbon in the iron carbon alloy, steel, is shown in Fig. 1.

These critical changes which take place in the heated steel vary with the carbon content and again plotting the various values of the critical temperature points from a series of these cooling curves against the carbon content of the sample studied, the curve shown in Fig. 1 is the result.

With the understanding of the method of arriving at these curves, their interpretation and use for the determination of proper heat treating temperatures is made possible.

When a piece of steel is brought to a highly polished plane surface and examined under a microscope the metal may be resolved into a net work of crystals. Etching with various chemical reagents brings out the boundary lines between these crystals more distinctly and affords a means of distinguishing the various constituents in steel. This crystal structure corresponds to definite mechanical and heat treatment. It has been mainly through this visual study in conjunction with the chemical analysis that we have been able to arrive at our present knowledge with regard to the composition of steels and their heat treatment.

Some of the micro-constituents of steel which are commonly recognized are Austenite, Martensite, Troostite, Sorbite, Pearlite, Ferrite and Cementite. Depending on the quantity of each of these constituents or combination present, the properties of the steel may within reasonable limits be predicted. Referring to the curve shown in Fig. 1, steel at a temperature corresponding to its carbon content, above the line Ar 3, Ar 3-2 and Ar cm consists entirely of Austenite. Austenite is a solid solution of carbon in iron or iron carbide in iron, which is a little harder than soft iron. In cooling below this upper critical range, the Austenite undergoes a transformation, first into Martensite then Troosite, Sorbite and finally into Pearlite plus Ferrite for steels up to about 0.85 carbon. Above this carbon content the final constituents are Pearlite plus Cementite. Martensite is extremely hard. Troosite is intermediate in hardness between Martensite and Pearlite. Pearlite is a laminated mixture of Cementite and Ferrite. It is fairly ductile and tenacious. Sorbite is a transition stage between Troostite and Pearlite, has a very nearly amorphous structure and an extremely high tensile strength with fair ductility. Cementite is a compound of iron and carbon corresponding to the formula Fe3 C and is glass hard and brittle. Ferrite is pure iron, very soft and ductile.

The line Ar 1, Ar 3-2-1 represents the lowest critical range for ordinary steels. The cross-sectioned area on the diagram indicates the intensity of the transformation range. At the narrowest cross-sectioned portions of the curve, we have the lowest intensity of critical range, at these points the critical range is not sharply defined.

Three common operations performed with steel in its heat treatment are annealing, hardening and tempering. In annealing a fine grain structure and softer material is usually the aim.

To secure this fine grain structure it is necessary to heat up a little above the upper critical range. Too high a temperature and holding the steel above the critical range for too long a period allows the grain size to grow giving a coarser and weaker structure to the steel. Because of the hysteresis or lag due to the rapid change of temperature while heating up, in ordinary practice it is necessary to heat from 40 to 70 degrees F. above the upper critical range. In addition, the cross section of the steel heated must be considered as it will take longer to heat up a large section than a small one.

The steel is now cooled slowly either with the furnace or by placing in lime, etc. It is fine grained and as soft as one heat treatment can make it. To harden steel, the steel should be heated up through the same point and immediately quenched in oil or water. Medium and heavy sections should be quenched in oil to prevent developing excessive strain due to the sudden contraction of the hot steel. Smaller sections may be quenched in water. This quenching process fixes the solid solution of Austenite in the form of Martensite or Troostite usually. For most purposes after the grain refining process the steel is in too hard a condition for immediate use. To relieve the quenching strains and soften the steel it is tempered by reheating to a temperature below the lowest critical range Ar 1.

The temperature to which the steel is reheated and the time it is held at that temperature determines the amount of further transformation allowed, and fix the physical qualities of the steel.

The diagram of Fig. 1 is intended as a *guide* to proper heat treating temperatures for normal steel. It is not *absolute* and should be used experimentally to obtain practical results with any steel.

Rate Schedule Changes

IVAR LUNDGAARD

IN ORDER to meet the changes in cost of service to our consumers, it has been necessary to issue new rate schedules from time to time. From the inception of the central station industry up to the time of the beginning of the European War, a rapid and steady decrease in cost and price of electric service had taken place, and due to recent improvements in equipment and to larger production, the prospects were at that time good for a continued decline in cost of service. During the Year 1916, however, prices of raw materials increased to such an extent that it became very evident that in order to maintain the Company's net earnings it would be necessary to increase the rates for gas and electric service.

The first substantial change in rates to this effect was made in March 1917, and all old contracts terminated within one year from that date. In this schedule a change was made with reference to term of contracts. Previously, contracts were made with our consumers for a duration of one year with the privilege of cancellation by ten days' notice in writing. This arrangement was superseded by the following clause: "Subsequent to signature of application for service, these rules and schedules shall, on the date of meter installation, become applicable to the customer's service thereafter unless automatically terminated by notice to disconnect the service, as hereinafter provided, or unless superseded by another schedule or rules duly advertised and filed with the Public Service Commission." The individual consumer is protected from arbitrary action by the Company, in that the Company has virtually made a contract with the community to all individual consumers.

The next schedule was filed in June 1917, and others in September and

December of the same year. Still another schedule was filed in January 1918, as well as one on July 1st and one on July 13th. The changes made include changes in charges for service as well as changes in rates for gas and electricity. The policy of free lamp renewals was discontinued and a charge for running gas services was introduced and subsequently increased. The charges for electric service connections have been increased twice.

While the rate for residential electric service has not been changed, those consumers buying electricity wholesale under the general schedule for light and power are now paying an average of from 25% to 30% more for electricity than they did previously under the same conditions.

A new policy was introduced in the schedule becoming effective December 20th, 1917, in that a higher charge was made for direct current than for alternating current for power. Previously both kinds of current had been sold on the same schedule of rates. In former times a great deal of current was generated as direct current while now nearly all generation is in the form of alternating current and direct current is obtained by "conversion," which makes the direct current service more costly than the alternating current service.

The so-called "Two-Rate Schedule" has been discontinued. This schedule was applicable to customers with an unusually good load factor and some of our customers operating 24 hours per day earned exceptionally low rates under this schedule. It was based on purchase of current from Niagara Falls and as this purchase of current has been discontinued, this rate has no longer any foundation.

The changes in price of gas have been of less consequence than the changes in electric rates. The rate changes for gas have consisted in eliminating the "lower steps" from the schedule. Gas is sold on a quantity basis, that is, after having purchased a certain amount, an additional quantity can be obtained at a lower rate and again still more gas can be purchased at a still lower rate. The lowest step was 40c per thousand while at present the lowest price is 60c. The initial price for small consumptions of 95c per thousand has remained the same but on July 1st of this year a minimum charge of 50c per month per consumer was made effective. Previous to that time no minimum charge was made.

It is only through drastic improvements in equipment that the Company has been able to maintain a sound financial condition without making more radical changes in rates. Through these improvements our consumers obtain service that is low as compared with the general increase in cost of raw materials and labor. The Company is the gainer by not having to impose upon its customers large and unpleasant increases, and because it has completely gained the upper hand in competition with other sources of electricity and industrial fuel. The growth of the Company's business has been enormous and most of this growth is applied directly to production of munitions for the ultimate victory of Democracy.

Predictions are of little value in times like these, yet it is hoped that future increases in rates, if any, will be of small magnitude. Until some time after the war is over the cost of raw materials and labor will continue to increase. If this takes place without sufficiently great improvements in machinery and methods to offset the continually rising costs, other rate increases will be necessary from time to time. The industry, however, is continuing to receive the close attention of trained and thoughtful men and it is hoped that their efforts to cheapen production will prove even more successful in the future than in the past.

Experiment in Insurance Co-operation

CHARLES E. MORRISON, C. E.
General Manager Utilities Mutual Insurance Company

PRIOR to July 1, 1914, when the workmen's compensation act became effective in New York State, the public utility interests, as represented by both the electric and gas industries, conceived the idea of forming some sort of mutual organization for the purpose of taking care of their needs in respect to compensation insurance, particularly with the thought that by so doing they might practically demonstrate the advantages of co-operation in connection with this detail of their business. This included, naturally, not only the payment of claims for accidents incurred but also its corollary, "accident prevention."

As a result of this thought on the part of the public utility operators, the Utilities Mutual Insurance Company was organized with approximately 100 electric and gas companies constituting its membership.

The scheme was to conduct the operations on a purely businesslike basis, and in effect the organization was, as its name indicates, a truly mutual compensation insurance company, confining its activities, however, exclusively to this form of insurance and to New York public utilities. Numerous advantages were to be derived by thus restricting it to preferred classified risks.

To every member company the same premium was charged that would be charged by a tariff or stock compensation insurance company, and then, after having set up appropriate and adequate reserves for losses that had been incurred through accidents, as well as charging against operations all necessary expense, the undivided surplus was to be distributed among the member companies as a dividend, thus operating to reduce the net cost to the members themselves.

So far as is known, this is one of the first practical demonstrations in the utilities field of companies getting together for the purpose of reducing operating expenses by a mutual or co-operative organization.

There are, of course, many national, state and local, scientific, commercial and other bodies in the industry which generally seek to assist one another by the exchange of technical, commercial or other ideas, data and information; but perhaps it remained for the Utilities Mutual to demonstrate conclusively that it was as feasible to pool the interests of the industry for the purpose of securing the financial returns from co-operative action as along other lines.

Business Success of the Undertaking

As one looks back on the organization as first constituted, it seems as though it were a very foolhardy undertaking for a group of public utility operators to originate an insurance company with practically no knowledge of insurance matters, but it remains to be said nevertheless that these operators, through the application of business methods, have made their undertaking a very profitable one.

In no year has the company returned less than 20 per cent in the form of dividends, and its surplus has always substantially exceeded this amount. In effect, this means that by the application of business methods to the detail of compensation insurance for public utilities we are able to cut the cost materially below that of the stock or tariff companies. A question naturally arises as to how these results have been accomplished.

Chief Factors in Success

We say, without fear of contradiction, that perhaps the largest contributors to this success are the 100

per cent moral hazard, the mutual interest and the co-operative spirit that naturally exist among public utility operators as a class. This spirit, as a result of the elimination of competition, may unquestionably be more intensively developed among them than in any other single industry, and as a consequence the insurance carrier —which is in effect the member companies themselves—has reaped the benefits in that safety first suggestions have been uniformly and willingly complied with by the operator and accidents correspondingly decreased.

The recommendations offered to our member companies deal primarily with the physical hazards existing in their plants and are the result of the most careful engineering inspections. It is wise to note here, however, that there is a very marked difference bebetween our engineering inspections and those of other companies or organizations. It rests primarily on the fact that we believe more can be accomplished by a sincerity of purpose than by an arbitrary attitude that this or that may be wrong and therefore *must* be corrected. Our engineers are known personally to the staff of each member company as responsible, painstaking men, and they always get a cordial reception when they undertake an inspection. It is because they get close to the operatives that an interest is created in their work and their recommendations and that, as a sequence, the reduction in the number of accidents has taken place.

We endeavor to make at least two examinations of each company's property in each year—the sane engineer never making two successive inspections. This enables us to place a check on the observation powers of each inspector and to create a friendly rivalry among them. As soon as these inspections are made the home office is advised, and a communication with a report is sent to the manager of the member company requesting him to inform the home office as to what action will be taken with respect to these recommendations. Invariably the reply is that they will be complied with immediately or as soon as the material and labor can be supplied for the purpose.

While these recommendations deal largely with the removal of physical hazards or defects and the installation of safety devices, they act also as a stimulus to further effort on the part of the employees and the management. They also apply to housekeeping conditions the morale and esprit de corps of the employees. Careful supervision is kept of these recommendations through a follow-up system, to see that eventually they all are complied with.

The inspections are quite frequently followed by safety first talks and committee meetings, together with illustrated moving pictures on standard safety first practice. We endeavor to see that all of our member companies are supplied with the invaluable bulletins of the National Safety Council, as these always have some vital message to tell.

Accident statistics are kept of each member company, so that at any time, is possible to develop each company's experience for the purpose of correcting unsafe practices. This develops a comparison of each member company's experience with that of the average of all, and if the experience of the individual is less satisfactory than that of the group as a whole, there is immediately created an incentive on the part of the operator or general manager to better this record in order to present as clean a slate as that of others to whom he is personally known. Should an abnormal record develop with respect to any one particular company, a conference is arranged with the general manager for the purpose of discussing in detail his safety first work or lack of safety first work.

Frequently an inspector will be assigned for an intensive investigation of two or three weeks to one of these member companies for the purpose of studying the underlying spirit of the organization and to determine whether there is not some element or factor which is tending to cause carelessness on the part of employees and therefore to promote accidents. Sometimes also the safety engineer of one organization will be loaned to another in the interests of "safety first."

That these inspections have produced results is demonstrated beyond question by the record of fatalities which in the electric industry contribute most largely to the losses. The following will serve for an example: Among approximately 5000 employees with an annual payroll of about $5,000,000 the six months ended June 30, 1917, contributed just one fatal accident.

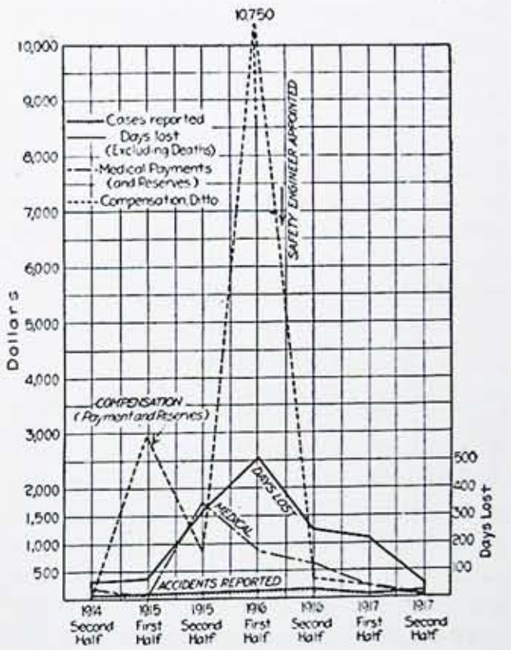
Even in this case it is questionable if the accident was the result of operating conditions, as it is felt, and we believe proved, that the employee died from natural causes. This one fatality compares with six fatal accidents occurring in the preceding six months. While it is appreciated that there may be a considerable element of chance or luck in this, there are good grounds for believing that the more intensive inspection service in the later period contributed very largely to this reduction of fatal accidents.

Accident Reduction as a Business Proposition

One particular reason why our member companies are so willing to co-operate for the protection of their employees—aside from the purely humanitarian one—is that they can readily see how their personal interests are being served by the reduction of accidents at their respective plants. Every life that is saved, every accident that is prevented, means so much less in the cost to the company as a whole, and therefore so much more surplus to be divided among the individual member companies in proportion to the premiums that they pay.

On a purely dollars-and-cents basis this co-operative spirit has returned to the public utilities of the State in the past three years a sum in excess of $100,000. Such an amount is not to be belittled in these times of increasing production costs, and we know of no other department in public utility operations that compares with this return.

There is submitted with this article a curve which indicates what may be



How a Utility Company's Accident Cost Decreased with Appointment of a Safety Engineer.

expected to happen when the safety first and accident prevention problems are attacked in a consistent and intelligent manner.

This curve represents the experience of a public utility company in the State of New York. It will be noticed that to the left of the peak the compensation costs, medical costs and days lost, which latter do not include fatalities, are very irregular and excessive. The peak represents several serious accidents, and at this time it was deemed advisable to secure the services of a safety engineer. A

glance at the curve to the right of the peak will show how the compensation costs, medical costs and days lost have consistently fallen.

Perhaps immediately after the several serious accidents was the strategic time to prepare intensively against similiar occurrences, and perhaps also eighteen months may not legitimately be considered as conclusive evidence of accident experience. However this may be, nevertheless we do know from the curve that less money has been spent for compensation, less money has been spent for medical attention, and fewer days of lost time have been recorded, since the installation of the safety engineer than before it. No further evidence, it is believed, is necessary to indicate the vital need of attention to careful and safe practices among employees not to prove how enormously it may contribute to accident reduction.

—*Electrical World.*

Prevention of Home Accidents

DANGER IS not entirely confined to the streets, where there is much traffic and many fast moving vehicles, nor to the industrial establishments, where there is complicated machinery, but very often danger may be found in your own home, although you have learned to believe that your home is the safest place of all.

Despite this widespread belief, it is a fact that a formidable number of people, a great many of them in Rochester, lose their lives or are crippled in their own homes through accidents which have happened so frequently that they have come to be known as common accidents.

There is a distinction between other accidents and those which happen in your own home, for in the latter case *you are to blame* for any accident of a preventable nature which happens there and through which yourself or any member of your family is injured.

When you are in the street you might be the victim of a reckless autoist or other driver, and when you are at work your injuries might result from the carelessness of another worker, or some defective machinery, but in your home *you are responsible for the hazards* which exist there.

After your return from work today, you should see if your home is safe and whether danger exists in the house, the yard or the vicinity and whether this danger is safeguarded, for danger cannot be eliminated entirely, but it can be controlled.

Thousands of babies have been scalded to death because their mothers left hot water within their reach. Place all liquid out of the reach of children.

You should never allow children to play with matches, because records show that a great many of them are burned to death and much property is destroyed each year because this dangerous practice is permitted.

Stepping on nails and broken glass has caused many cases of infection and blood poision. Keep the premises clear of all sharp objects.

Place all poisons where they cannot be reached by children, and label the container "Poison." Remember that children, through curiosity, are apt to taste of anything they can lay their hands on. Poisons should be kept in a separate closet and this should be locked.

Children are likely to fall from porches or high places. Good safety rails should be provided to protect them.

Falling down a stairway is always likely to cause a serious injury. Keep the stairways well lighted, if possible, in good repair and have the bottom step painted white if the cellar stairway is dark.

Ninety per cent of all infection is caused by neglecting slight injuries. Use iodine on any break in the skin which draws blood.

Public Safety Committee,
Rochester Chamber of Commerce.

The By-Products of Coal

WILLIAM H. EARLE

COAL IS a more widely discussed commodity today than ever before. From being merely something to be shovelled into the furnaces to produce what heat it could under conditions often adverse to its best utilization, it is today a necessity to be tenderly cared for, and carefully used. It is more than that, for it is one of the chapters in nature's book of wonders.

Born in an age so remote as to be beyond human realization, coal is today the greatest available energy resource in the world's industrial life. Its proper utilization, working toward maximum efficiency and true conservation, is a problem commanding the best engineering skill.

Tracing its way up through the ages, geology discloses in fascinating, if unsatisfying order, the growth of continents and the evolution of life forms. It is portentuous that with the appearance of the animal horizon, of the fish, the first vertibrate, presaging the later appearance of intelligent beings, should have been so closely followed by that marvelous age wherein all nature seemed to be intent upon storing energy.

Geological theories may be divergent or entirely opposed, yet all agree that the Carboniferous age was peculiar in its climatic conditions, and in the variety, size and nature of its plant life. Rapid and luxurient growth, early decay retarded by influences which prevented rapid oxidation and protected plant structures were the characteristics through which vast beds of humus matter accumulated.

The metamorphosis of this material under the later influences of heat and the pressure of overlying deposits of later eras is a baffling subject, but upon it we are dependent for our known coal deposits, said to cover nearly half a million square miles of the earth's surface, nearly half of which is in the United States.

The classification of coals may follow anyone of several lines depending on the point of view, physical, chemical or utilitarian. But whatever the basis, it must show the tendency upward, as shown by table below, from vegetable life through wood to anthracite.

Bituminous coal occurring in greatest quantity and in a greater number of localities, is naturally the type which has found the greatest industrial field. The peats and lignites are of more or less local importance only. Anthracite coal due to its restricted output, higher price, and cleanliness has been devoted largely to domestic uses, with a few industrial demands.

Coals are analyzable in two ways. The first is called "Proximate Analysis" and the second "Ultimate Analysis."

The first tells something of the physical qualities while the second shows the elemental composition. To a person accustomed to interpreting coal analyses each is of value in identifying the usefulness of the coal for his specific purpose. Yet both fall far short of really evaluating the coal or

	Percent Carbon	Percent Hydrogen	Percent Oxygen	Percent Nitrogen	Percent Sulphur	Percent Ash
Cellulose	44.6	6.2	49.4	.....	.....	.....
Wood	48.5	6.0	43.5	0.5	.....	1.5
Peat	58.0	6.3	30.8	0.9	Trace	4.0
Lignite	67.0	5.1	19.5	1.1	1.0	6.3
Bituminous Coal	77.0	5.0	7.0	1.5	1.5	8.0
Anthracite Coal	90.0	2.5	0.25	0.5	0.5	4.0

Table 1—Classification of Coals

expressing the intricate nature of the substance or the products derivable therefrom.

Following are examples of the two types as applied to a bituminous coal used for gas making.

PROXIMATE ANALYSIS

Ash	8.97%
Volatile Matter and Sulphur	33.99%
Fixed Carbon	57.04%
Heat Value	14,030 B. T. U. per pound

ULTIMATE AYALYSIS

Not the same sample as above

Carbon	77.28%
Oxygen	7.19%
Hydrogen	5.41%
Nitrogen	1.43%
Ash	7.50%
Sulphur	1.19%

The art of coal use has been of long development. It is within comparatively recent years that people have paid any attention to smoke consumption and only then because smoke became a community nuisance. Later, coal users found that everything that went up in smoke represented so much unburned fuel and wasted money.

Then modern combustion methods developed the art of consuming coal with the idea of securing maximum benefit. This dates back to Murdock who about 137 years ago laid the foundation for the gas industry.

Look back to the Ultimate Analysis. Carbon, oxygen, hydrogen and sulphur are the chief coal ingredients. They likewise constitute chiefly the whole vast system of organic chemistry, the structures of all plant and animal life. Inasmuch as coal is a direct descendant of vegetable life it must in itself comprise a great number of compounds made up of these few elements. Moreover, containing these elements, reactions are possible under proper influences, by which these elements may be made to reunite into other and more complex compounds. This is the basis of coal distillation and by-product recovery.

Bituminous coal is heated at high temperatures, under partial vacuum until all the volatile matter is driven off as vapor or gas, and only the fixed carbon and ash remains. These constitute the coke. The gas contains all the other products, part of which may be inherent in the coal, but most of which are the result of secondary reactions.

By proper methods of selective condensation and washing, the gas is freed from the substances which are not permanent gases at ordinary temperatures or which are undesirable or are of more value elsewhere. When thus purified the gas analysis is somewhat as follows:

Carbon dioxide	1.2%	by	volume
Oxygen	1.0%	"	"
Carbon monoxide	6.7%	"	"
Hydrogen	48.7%	"	"
Methane	30.8%	"	"
Nitrogen	8.0%	"	"
Illuminants	3.6%	"	"

The "illuminants" are a complex mixture of so-called unsaturated hydro-carbons.

In the process of producing the above gas for domestic and industrial consumption the other constituents liberated from the coal are collected as tars, ammonia liquor and light oil.

The tar is of immeasurable importance. About fifteen gallons are produced from every ton of coal which is coaked or carbonized, or 1.5 gallons from every thousand feet of gas produced. It is a black, semi-viscous liquid with a rather pungent odor, but it has tremendous potentialities. Refined and purified, distilled, and redistilled, successively condensed, crystallized and so on, it is responsible for 300,000 or more compounds ranging from road building pitch to the most varied tints for fabric dyeing, and from roofing material to the most delicate of perfumes. It embodies artificial flavoring material. It is the basis of much of modern medicine, and while the explosives derived from it are working havoc on the battle-

fields, its products heal the sick, cleanse the wounds and otherwise perform the work of mercy behind the lines.

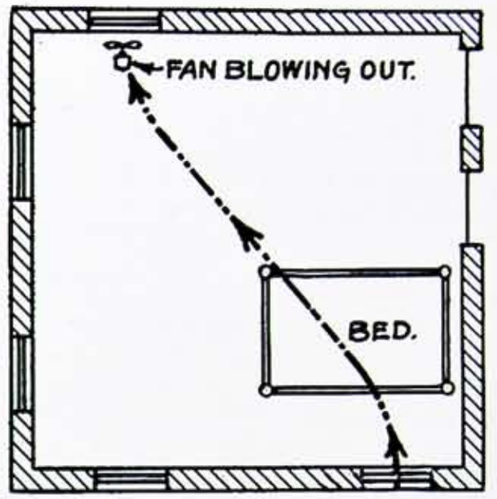
Ammonia is also a product removed from the gas which commands its own industrial sphere. Refer again to the Ultimate Coal Analysis. Part of the nitrogen and part of the hydrogen unite to form ammonia, which is carried off with the gas and dissolved out by water. The solution is concentrated for purposes of shipment, and this gas liquor forms the basis of all ammoniacal products, fertilizers, explosives, and so forth.

The other by-products recently come into prominence are the so-called light oils, dissolved or washed out of the gas by bringing it into contact with a solvent oil. These are products are the benzols and toluols, now so commonly known as to need little discussion here. But it also carries with it another great field of possibilities in other and lesser known products, xylols, cumarones, and many others which are playing a larger and larger industrial role.

So varied are the products and so wide their applications, that a ton of coal carries more potential resources than a gold mine, and so intimately are they associated with our existence that "coal" seems to write its name in a universal language.

Efficiency Applied to an Electric Fan

During these days of extreme heat electric fans and what they do toward making a room more comfortable, are matters that interest everyone. It is sometimes difficult to place the fan in a position that will not cause an uncomfortable draft even on a very warm day. Here is the result of a little experiment conducted by Vice President Robert M. Searle with an electric fan in his bedroom on a hot night. The same plan might be carried out in an office and there seems



to be no reason why the result should not be as satisfactory.

The diagram is that of a room with five windows and two doors. The temperature inside the room was 84° while out of doors it was 78°. With the windows open and no breeze stirring, the fan placed on one side of the room set the air in motion, creating more or less of a draft, but in no way lowering the temperature of the room. The fan was then placed on a chair facing one of the windows and blowing outward. The other windows were closed excepting one diagonally across the room. The fan caused a quiet circulation, as shown by the dotted line in the diagram, the warm air being blown out of the window before which the fan was placed, making way for the cooler outside air to come in through the open window on the other side of the room without causing any unpleasant draft. After twenty minutes the temperature inside the room was found to be the same as that outside.

The noise of the fan was also considerably reduced by setting it on a small cushion.

Mr. Searle has also observed that a fan frequently gives best results in an office when placed on the floor. The general ventilating effect is secured without uncomfortable draughts and without blowing papers from desks.

GAS AND ELECTRIC NEWS

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Engineering and Construction
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Investing Savings to get Ahead

IT IS repeating an axiom to say that almost everyone wants to "Get Ahead." Some few of very modest ambitions realize them early in life and live thereafter in a contented frame of mind, well satisfied with the food, clothing, and shelter which a moderate amount of work will provide for them. Most people, however, want to secure better food, clothing, and shelter; want to work at tasks which are congenial to their temperament, and want opportunity for the development of the finer instincts which thrive on a reasonable amount of leisure, such as travel, reading, the cultivation of friends, et cetera. Then, too, the family instinct is natural, and with it the desire that one's family may enjoy greater privileges than we, ourselves, are experiencing.

This forms a superficial statement of what getting ahead means. Progress comes through ambition properly directed, and the simple formula is, plan—work—save—and make your savings work for you. Few will question the truth of this, and nearly everyone follows it to the best of his ability. Most of us are restricted, however, in the execution of our plans, for many are required by personal circumstances to do other than the work they would choose, are unable through personal weakness or other conditions to save what they should, and through lack of knowledge cannot make their savings work for themselves to the best advantage.

The disposition of savings is made in three ways: By hoarding where the savings earn nothing; by utilizing banks where a definite return is secured, the banks in their turn reinvesting in property of some kind; and third, by investing in property directly.

All investment is subject to risk, and the risk is in general proportional to the investment return or interest promised. United States Government Bonds are probably the safest investment possible, "wild cat" stocks the most risky, and between the two lie thousands of enterprises making up the business of the world.

Now this superficial resume of elementary facts is developed for the express purpose of overcoming the inertia of the human mind as displayed by many employees of this Company, and others who are interested in it. Many have followed the traditional formula,—have planned, have worked, have saved, have invested, and now are "letting well enough alone." Is your money working for you to best advantage? Are you getting ahead as fast as you ought and can? Remember the old French proverb, "Opportunity comes while sleeping," and if you are asleep in taking care of your surplus, wake up! Think of every dollar that you possess as working for you and put it where, *with safety*, it can make the most for you. And in this connection investigate very carefully the opportunity which is now available to invest in the 7% Preferred Stock of this Company, to become a partner in a large, safe, and growing business, one which is an essential to the progress of our city in both war and peace. If you are thrifty, become more so; if you are not, learn how. What stands between any man and want or the accomplishment of his desires? Health, insurance, and his accumulations. The first is uncertain; the second is generally inadequate; but the third can be made sufficient by prudence.

Read over your files of "Gas and Electric News" to refresh your memory on what you know about the Company, its history, its organization, its physical property, and its certain future. Finally crystalize your convictions into action.

Enthusiasm and Accidents

ACCIDENTS often happen through enthusiasm. Who has not been "tinkering around the house," or working on some invention, or repairing some machine, and become literally absorbed in "making it go?" So, one uses makeshift methods, drops tools where they will be in the way, slights details for future consideration, to get the job done, and has many cuts and bruises as unpleasant and perhaps dangerous souvenirs of the occasion. Many men are equally interested in their daily work and handle equipment with an amazing celerity and a gratifying display of energy. They get results, they also get occasional injuries. These men do not deserve censure, they are not careless. There is simply a conflict in their intelligence between the thoughtfulness for the risks attendant upon the work and intense concentration on the result they are seeking to achieve.

For these men we have a keen interest and a word of friendly and well-meant advice. Perhaps a constant thoughtfulness for accident prevention, when engaged in interesting work, will be contrary to the habits of half a life time, but nevertheless the senses will respond with an almost unbelievable readiness when we really try. It pays to be careful.

The Same Beast

ABOUT 602 B. C. Jeremiah the prophet said: "Can the Ethiopian change his skin, or the leopard his spots? Then, may ye also do good that are accustomed to do evil."

Before the Third century A. D. the Greeks had an elaborate system for utilizing color effects in architecture, but the knowledge was lost for centuries "owing to the general destruction of Greek temples and other public buildings during the Teutonic drives, which practically overwhelmed Greek civilization in the Third century A. D."

Roger Bacon, writing in the thirteenth century said:

"There is no doubt that all the heathen nations beyond Germany would long ago have been converted but for the brutality of the German House, because the pagan race has again and again been ready to receive the faith in peace through preaching. But they of the German House will not allow it, because they want to subjugate them and reduce them to slavery, and by subtle persuasions they have for years deceived the Roman church. This is notorious, otherwise I would not make the charge."

Dr. Vernon Kellogg, biologist, discussing recently the philosophy that has shaped German thought, wrote:

"It is a philosophy that puts man's position and behavior back, not into medieval times, but into pre-historic Glacial time, when a half-beast, half-man type was all of man that earth knew."—*The Valve World.*

A War Time Motor Installation

MELVIN D. ANDERSON

SHERMAN'S FAMED utterance is emphasized in the present day business as well as in the present day world conflict. This is brought out in the recent 300 H.P. motor installation at the Moseley & Motley Milling Company. This firm, which operates two flour mills on Brown's Race near Station 3, used water power for plant operation and supplemented the water power with steam power when the water supply became low. The increasing difficulty of securing coal and labor made it evident that some other means of power should be used if possible, and with an idea of greater economy in power plant operation the question of motor drive for Mill A was referred to the Railway & Light Company.

The first difficulty encountered was the lack of space. The main shaft extended across the entire basement and if a motor was to be connected directly to this shaft it would be necessary to build a separate motor house or place the motor in the adjacent building. It happened that this building was owned by the Rochester Railway & Light and used as a storehouse. The basement, however, was not being utilized and consequently a space was secured for a motor room.

An inspection of the floors and walls of this building showed that the strains from such a load would be too severe for safe operation. It was therefore necessary to go down sixteen feet to solid rock and build a pier to support the pulley, clutch and bearings. At the same time concrete pedestals for the bearings were constructed on the pier to insure absolute rigidity. In order to counteract the overturning effect of the belt tension a twelve-inch concrete-enclosed I-beam was placed between the pier and the wall as shown in Figure I.

In the motor room proper I-beams were laid and covered with concrete to form the floor and support for the motor. Pedestals for the bearings were also constructed similar to those on the pier.

The steam installation consists of 3, 125 H.P. Boilers and a 350 H.P., Hamilton-Corliss Engine. The ideal motor installation would have been a 300 H.P., 3-bearing motor with a bed plate, but a survey of the market showed that the time necessary for the delivery of such a piece of machinery was well over a year. This was too great a delay, and so the next best thing under the circumstances would be to secure a 300 H.P., 2-bearing motor and complete the installation with parts designed and built in Rochester, or secured from other sources.

The motor finally purchased was a 300 H.P., 440 volt, 3-phase, 60 cycle, 490 R.P.M., 2-bearing Wagner Electric Manufacturing Company, A. C. motor. This was bolted directly to the floor without a bed plate. A section of 4 11-16 in. shafting supported by two bearings was attached to the motor by means of a Francke flexible coupling. Between the two bearings a pressed steel pulley of 40″ diameter was placed. The main shaft operated at 200 R.P.M., and in order to secure the correct speed desired a pressed steel pulley of 8 ft. 2 in. diameter was secured and placed on the extension of the main shaft. This pulley was connected to the motor pulley by a 30 in., 3-ply leather belt. It is the best practice in horizontal belt drives to have the slack side of the belt on top, but this was impossible because the direction of rotation of the main shaft was not suitable. Furthermore, the distance between shafts should have been somewhat greater than could be provided for in this installation. In order to overcome these difficulties a belt-tightener was necessary under the slack side. It happened that the Milling Company had such a tightener in storage which had been in use formerly in their B Mill. This was put into shape and installed to take up the slack in the belt and eliminate the above mentioned difficulties.

The 5 15-16 in. extension of the main shaft on which the large pulley was placed was supported by three bearings and was connected to the main shaft in the flour mill by a second Francke flexible double coupling. In order to disconnect the motor from the main shaft in case water power was available a triple gear-operated friction clutch manufactured by the Hill Clutch Company of Cleveland has been installed between the driven pulley and the flexible coupling. It will therefore be possible to start up the motor under full load, or start it running light and put on the load afterwards by means of the clutch.

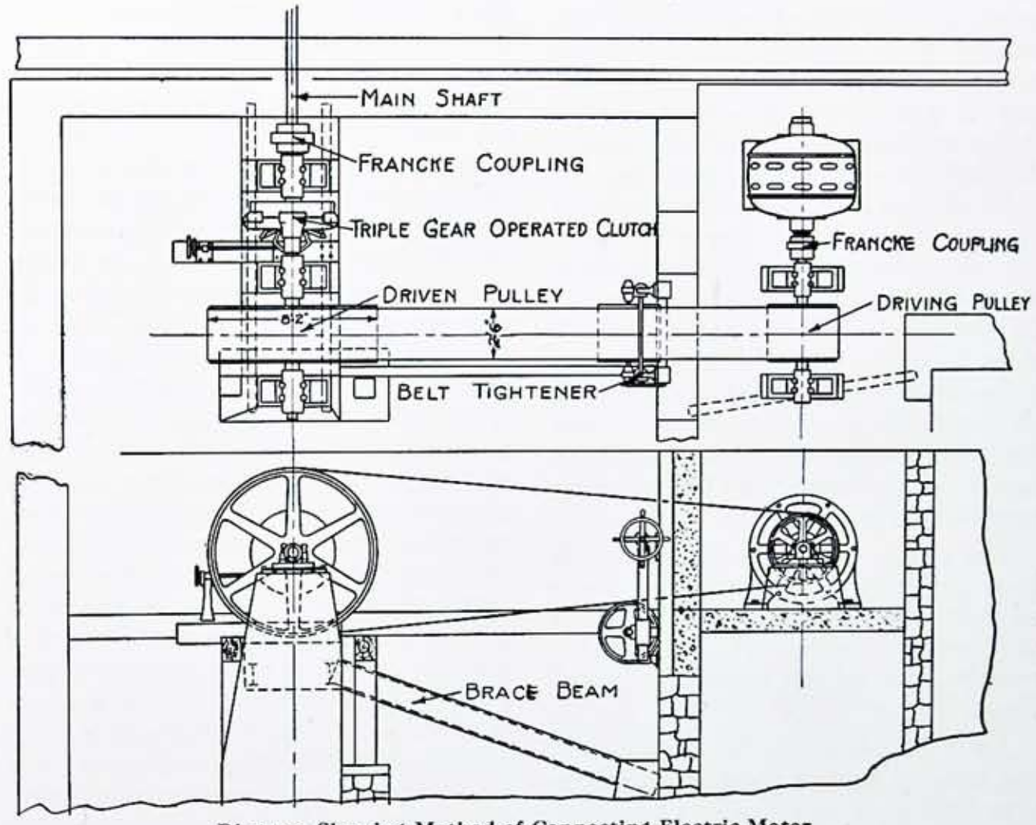


Diagram Showing Method of Connecting Electric Motor

At certain times in the year the mill is filled with grain, and this heavy concentrated weight has a tendency to throw the main shaft out of alignment. To take care of this condition a coil spring bearing block has been placed under the main shaft in the opening thru the wall near the Francke coupling. If, due to these concentrated weights, a very great strain is placed on the main shaft causing it to settle, the springs under the bearing block will give way allowing the flexible coupling to take up all misalignment. This will eliminate any danger of breaking the shaft.

The motor is protected by a Westinghouse Type F-2, 500 ampere, 3-pole, single throw, 440 volt oil circuit breaker with overload and no voltage release coils. One rather unusual feature in connection with the circuit breaker is the direct motor control from any part of the building. The circuit of the no voltage release coil

has been extended to various stations throughout the Mill. By pushing a button the no voltage release is caused to operate thereby opening the oil circuit breaker. In this way the motor can be shut down almost instantly from any department.

Another very unusual proposition is being worked out at this Mill. As the water supply decreases the power delivered by the water wheel will decrease and the speed will likewise decrease. It is planned to operate the motor in parallel with the water wheel and as the power delivered by the water turbine decreases the motor will deliver an increasing amount. In order to check up the power input to the motor an indicating wattmeter has been installed and the plan is to carefully check up the water required for the motor friction load and full plant load and with these two figures arrive at the exact point when to put all the load on the motor and shut down the water wheel, and when to shut down the motor and let the water turbine do the work.

The motor and counter-shaft have been carefully enclosed to keep out all dust and moisture. The latter is very serious during the cold weather months, due to the proximity of the Upper Falls.

Thus it is seen that the present war has created such a condition in business that it is practically impossible to secure the ideal installation and "Substitutes" are the order of the day. It is evident from the above that a very good substitute has been secured for the desired ideal installation.

"This is the time for America to correct her unpardonable fault of wastefulness and extravagance."

—Woodrow Wilson.

Motor Troubles

CHARLES W. MILLER

THOUGH THIS department has held a place in the Company's organization for a number of years, it was not until recently that it came to be recognized as a vital factor.

In regard to the service extended the Company's consumers in case of trouble, there is employed at the present time a force of nine people. Two of these are trouble men, equipped with motorcycles and side car, in which they carry the tools required for work. The different sections of the city are covered by these men. When a complaint comes in, an effort is made to glean all the information possible from the consumer, as to the source or nature of the trouble. In this way a large amount of time is saved, as without this information, it would be necessary in most cases for the trouble man to make two trips, one to locate the trouble, and if any new or additional parts were needed, to return to the shop to obtain them and make another trip to install them. So it can easily be seen that the use of these means is a saving to the consumer, and at the same time furnishes prompt and more satisfactory service.

After the trouble man has located and completed his work, he then telephones into the Motor Department to know whether any more complaints have been received from that particular neighborhood. He will then take care of them in their respective places and order. If the trouble is of such nature as a burned out armature, or field winding, and it is not possible or practical to repair it on the premises, he brings it into the shop where it can be properly handled. After the repair has been made, it is put back into service as quickly as possible. When trouble of such a nature occurs, and it means that the consumer will be forced to shut down his factory or shop until his motor can be repaired, a motor is taken from the Company's stock and installed until such time as his own is again ready for service.

Work of this kind is generally done at a time most convenient to the consumer, either in the early morning, or at night.

The motor shop, where all the repairing and overhauling is done, is one of the best equipped for its size, in this part of the State. Its equipment consists of one direct connected lathe, drill press, emery wheel, high potential transformer, adjustable arbors, testing boards, winding machine, etc. Armatures are wound here from 1/16 H. P. in size up to 200 H. P.

A complete line of brushes, contacts, compensator parts, bearings, coils, etc., are kept on hand at all times, thus enabling us to satisfy the consumer's wants in a very short time. This department also does the winding of armatures and field coils, for the Transportation Department, and since the first of the year forty-five armatures have been rewound and placed back in service. The coils for these are formed and made up in the shop and placed in stock, so that when a burned out armature comes in, it is simply a matter of determining the size and type of coils required, taking them from stock and putting them in. By using this system an armature can be completed in from twelve to twenty hours, depending upon its size and number of coils required.

The washing machine is one of our greatest sources of trouble, especially on Mondays. In ninety per cent of the complaints, this trouble is due to the customer's negligence, such as lack of lubrication which results in burned out bearings and heating of motor; overload, causing couplings or clutch to break, or blowing of fuses; allowing the motor to get water soaked by carelessness in handling of water and wet clothes, causing it to become grounded, thus giving the operator more or less of a shock.

In a recent case of trouble with one of these machines, the consumer complained that after an hour's use or more, the motor began to heat up and smoke. We found the teazer or starting winding, as it is called, had become short circuited with the main or running winding. This condition arose from overloading and was the customer's fault. On another occasion we had a call from a consumer, having a twenty-five H. P., A. C. motor, which he claimed would not start. On examination we found that the housing was filled with dirt so that it caused the armature to strike, acting the same as a brake, also one of the bearings was dry and badly scraped and scored. This motor had never been cleaned since it was installed, and as in the previous case, its condition was due to carelessness.

All motors that the Company rents or loans are brought into the shop after a consumer or contractor has finished using them, where they are cleaned, overhauled, tested, repainted, and returned to stock. This also applies to starting rheostats and compensators.

As a general rule this department takes care of the Company's consumers only, but on several occasions we have been asked to extend our services to outside concerns. Not long ago we received an urgent call from a small town on the Sodus Line, this being the first time that it had called for outside aid. They had just installed a new 10 H. P. motor and when the load was applied it would slow down to approximately half speed. On checking up the wiring, we found three loose contacts or lugs that some one had forgotten to tighten.

On another occasion we found the slots between the segments of a motor repaired by another company were filled with copper dust and shavings, thereby causing a short circuiting of the commutator. After these had been thoroughly cleaned out, the motor was started and ran all right.

Employees' War Gardens

JOHN H. VAIL

IT IS very gratifying to note the increased interest in gardens this season over that of 1917. Our employees have under cultivation this season 34 lots as compared with 21 during 1917. A very recent inspection of plantings, cultivation and growth this season shows approximately 95% good, while some may be classed as excellent, and many above the average.

Fig. 1. Typical Garden Plot. Combination Planting.

Although the crops are not all in the same state of advancement there is abundant evidence of frequent and careful cultivation. With continual good cultivation, favorable weather, and diligent warfare against potato-bugs, we may anticipate an abundant crop of potatoes. Other vegetables are also making an excellent showing.

For the 5% which cannot be called good, several points must be considered. For the man who has made a good beginning in planting and can now see the sprouted seed struggling along without cultivation, and strangled by a growth of early grass and weeds, we would say get very busy without delay. First, hoe out the weeds and grass; second, give thorough cultivation; third, give a moderate local dressing of fertilizer hoed in, or frequent applications of manure water. Keep at it continually, and apply diligently the best efforts and intelligence to save the started crop. It is not yet too late to recover, but will be a total loss very soon.

To the man who has lost his interest and doesn't know what to do, let him ask questions. After the money and labor has been expended for plowing, preparing the ground, seed and planting, it would seem that the gardener should maintain his interest by proper attention and cultivation to the end of paying for his labor and investment.

Don't give up! Fortify with renewed courage! There are yet abundant opportunities for late planting of winter vegetables. Beans, beets, cabbage, turnips, celery, lettuce, spinach, and radishes can be planted and successfully raised before cold weather. A good combination would be beets, cabbage, turnips and celery.

The liberal use of fertilizers should receive serious attention. Garden plots that have received stable manure or commercial fertilizer show marked difference in growth, color, and thrifty condition over those which have not. The fact should be recognized that the soil needs the assistance of fertilizers to give fully satisfactory results.

Liberal fertilizing will pay every time. The increase in returns will in every case be far more than sufficient to repay the original cost and for complete success must be coupled with intelligent care and thorough cultivation.

Any growing crop that shows slow progress can be boosted with frequent applications of liquid manure. This can be made in a barrel, one-third full of stable manure and filled up with water. A quart of this strong liquid mixed in a pailful of water and applied in liberal doses of about half a pint to each hill or group of plants will soon show marked improvement, and give the gardener great satisfaction in the fact of making things grow. Half a handful of sheep manure to a pail of water is equally beneficial.

It will pay any man who contemplates a garden next season to diligently accumulate during the intervening months all the stable manure, good street sweepings, poultry manure, wood ashes, lime and other fertilizers he can secure. The lime and wood ashes should be kept separate from the manure, as mixing them has a tendency to set the ammonia free which is important to maintain in the form of nitrates.

This accumulation of fertilizers should be spread on the ground next spring before ploughing is done.

With the exceptions noted, our employees should feel much encouraged with their gardening efforts this season.

Fig. 2. Typical Garden Plot. Potatoes Only.

Gas and Electricity in the Home

BY THE GAS DEMONSTRATORS
Miss Frances E. Moore and Miss Irene Walsh

Drying

At this time when conservation of food is the order of the day, too much stress cannot be laid upon the necessity of saving every possible ounce of food. The home gardens will provide vastly more stuff than last year and drying offers to the housewife a way of saving large quantities of surplus products. The preservation of the perishable products and the use of perishable foods now in the diet, lessens the drain on our store of staple products and relieves the pressure upon transportation.

The knowledge of the fact that dried foods keep well is as old as man; drying was perhaps used earlier than any other method of food preservation. When foods are dried the micro-organisms originally present are not destroyed, but their growth and multiplication is checked. If moisture is supplied, active life quickly begins again. The dry yeast-cake is an interesting illustration of the way man at first adapted the principles governing the characteristics of micro-organisms to his own use.

Drying of vegetables may seem strange to the present generation, but to our grandmothers it was no novelty. It was not an unfamiliar sight to see in their kitchens strings of dried vegetables hanging from the ceiling. To the housewife in the town or city, living in a small apartment, drying is a special advantage; she can lay in a supply for winter's use without taking up much of the needed storage space. Then, too, small amounts of vegetables which are too small to can conveniently can be dried and saved. However, drying should not take the place of storing or canning to any considerable extent when proper storage facilities are available.

Effective drying may be done on plates or dishes, placed in the oven with the oven door partially open. It may be done on the back of the kitchen stove, while the oven is being used for baking. It may also be done on sheets of paper or lengths of muslin, or screening spread in the sun and protected from insects and dust. Trays made of galvanized iron bound with a wooden frame, the size of the oven, set about three inches apart are very satisfactory.

Sun drying requires bright, hot days and a breeze. Once or twice a day the product should be turned or stirred and the dry pieces taken out. During rains and just before sunset the products should be taken indoors for the purpose of protection.

Fresh vegetables dried by means of artificial heat in the oven should be exposed first to general heat and later to the higher temperatures. If the heat applied at the outset is at too high a temperature, the surface of the vegetable becomes hard, covering the interior so that it will not dry thoroughly. It is desirable to start the drying at a temperature of 110° and later increase it to about 140°. If a thermometer is not used the greatest care should be given to the regulation of heat. Leave the oven door partially open to permit circulation of air around the product. If your gas oven has a pilot, the temperature may be evenly regulated and maintained by keeping the pilot turned low. If the oven has no pilot the temperature will have to be carefully watched and the burners turned as low as possible.

The time necessary for the drying of vegetables varies, but with a little experience the housewife can tell when the product has been dried sufficiently. During the process the product should be turned several times to insure uniformity. When done the vegetable should be leathery and pliable.

Blanching is desirable for vegetable drying. It is done by placing the vegetable in a piece of cheesecloth, a wire basket or other porous container and plunging them into boiling water and boiling a given length of time. The vegetables that are usually dried in the home are sweet corn, string beans, lima beans and peas. The corn and beans take from 5 to 10 minutes and the peas 6 minutes to blanch.

After blanching, the vegetables may or may not be cold dipped, but as much moisture as possible should be removed with towels as the length of time of drying depends largely upon the amount of moisture removed after the products have been blanched.

The most important stage of the drying process is the *conditioning* of the product. This is done in a small way by placing the material in boxes, paper bags or cartons. Once a day for three or four days, pour the product from one box to another so as to give the whole mass an even degree of moisture. If the material is found to be too moist, it should be returned to the drying trays for a short time.

The dried products can be packed in small cartons, tin cans, glass jars, paste board boxes or paper bags and stored in a cool, dry, well-ventilated place. It is better to pack the products in small containers so as to prevent spoilage of a whole mass by moths or insects which sometimes grow on dried material.

Dried vegetables may be used in all dishes in which fresh products would be used, but first should be soaked in cold water to bring back the moisture. The vegetables retain the flavor of the original product.

Pickling

Pickling is an important branch of home preparedness for the winter months. Pickles have little food value, it is true, but they give a piquant flavor to a meal which is liked by many.

Vegetables for pickling, are usually soaked over night in a brine made of 1 cup of salt to 1 gallon of water. For some of the lighter pickles a weaker brine is used. The brine removes the water in the vegetables and so prevents the weakening of the vinegar; it produces a milder flavor and firmer product. However, the strength of brine required depends on the length of time the vegetable to be pick'ed is to remain in it. Too strong a brine softens and spoils the vegetable. In the morning the brine is drained off and the vegetable prepared with spice and vinegar according to rule.

A firm product is obtained if the vegetable is not cooked too long or at too high a temperature. Never use alum to make the vegetable crisp, it is harmful to the body. In cooking mixtures which contain vinegar, use an enamel, agate or porcelain kettle.

Pickles can be stored in jars or crocks but they should be well covered with vinegar to prevent molding.

❖

Seasonable Recipes

MIXED MUSTARD PICKLES

1 qt. ripe cucumbers
1 qt. small green cucumbers
1 cauliflower
1 qt. onions
1 qt. green tomatoes
5 green peppers

Cut all the above in pieces and put separately in weak salt and water for twenty-four hours. Scald each separately in same water, drain, and pour over them the prepared dressing.

DRESSING FOR MIXED MUSTRAD PICKLES

6 tblsp white mustard seed
1 tblsp turmeric
1 tblsp ground mustard
4 tblsp celery seed
1½ cups sugar
1 cup flour
2 qt. vinegar

Scald vinegar, mix together mustard, turmeric, sugar and flour; stir into the hot vinegar; continue to stir until the mixture thickens; set the dish in boiling water, cover and let cook fifteen or twenty minutes.

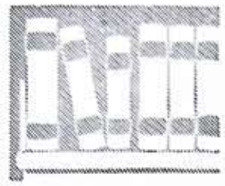
SWEET CUCUMBER PICKLES

Soak cucumbers for 3 hours in ½ cup salt to 2 quarts water. Drain, if too salty, rinse and mix.

4 tsp whole spice
1 tsp curry powder
2 tsp mustard seed
1⅓ tsp turmeric powder
2 tsp celery seed
2 cups sugar
2 qts. vinegar

Dilute vinegar, if strong. Add pickles and boil 20 minutes; store in crocks or jars.

Auditing



New Business

Net Increase in Consumers in First Six Months of 1918

	Dec. 31, 1917	June 30, 1918	Increase
Gas	78,657	79,307	650
Electric	27,774	28,535	761
Steam	51	55	4
	106,482	107,897	1,415

Net Increase in Consumers in Twelve Months Ending June 30th, 1918

	June 30, 1917	June 30, 1918	Increase
Gas	76,936	79,307	2,371
Electric	26,640	28,535	1,895
Steam	49	55	6
	103,625	107,897	4,272

Statement of Consumers by Departments as of June 30th

June 30	Gas	Elec.	Steam	Total	Increase
1908	39,265	6,190	....	45,455	.....
1909	43,282	6,817	....	50,099	4,644
1910	48,572	8,045	....	56,617	6,518
1911	54,286	9,674	16	63,976	7,359
1912	58,763	11,838	19	70,620	6,644
1913	64,138	14,811	21	78,970	8,350
1914	68,071	17,200	28	85,299	6,329
1915	70,749	20,585	35	91,369	6,070
1916	73,108	23,683	41	96,832	5,463
1917	76,936	26,640	49	103,625	6,793
1918	79,307	28,535	55	107,897	4,272
Inc. in 10 Yrs.	40,042	22,345	55	62,442	62,442
			1916	1917	1918

Net Increase in Consumers by Months

Increase in January	341	194	54
Increase in February	253	(Dec.) 19	56
Increase in March	339	386	183
Increase in April	684	608	322
Increase in May	765	568	508
Increase in June	645	726	292
	3,027	2,463	1,415

Subscribers to 7% Preferred Stock

No. of Subscribers July 1	1087
No. of Subscribers August 1	1241
No. of Shares July 1	7538
No. of Shares August 1	8495

Miscellaneous Data

	June 30, 1917	June 30, 1918	Increase
Miles of Gas Mains	444	488	44
Miles of Overhead Line	1,850	1,895	45
Miles of Underground Cable	1,069	1,132	63
Miles of Subway Duct	957	1,004	47
No. of Street Arc Lamps	1,590	1,723	133
No. of St. Inc. Lamps	7,938	8,674	736
Total No. of St. Lamps	9,528	10,397	869
No. of Employees	1,373	1,238 (Dec.)	135
Amt. of payroll (Mo.)	$111,911.08	$127,837.45	$15,926.37

E. B. A. for Month of July, 1918

Receipts

Bal. on hand 1st of month		$2,880.47
Dues—Members	$530.27	
Dues—Company	530.27	
Assessment—Members	180.75	
Assessment—Company	180.75	
Int. on Bank Bals. & Inv	100.00	
Members Additional Life Insurance	128.26	
Receipts for month of July		1,650.30
Total		$4,530.77

Disbursements

Sick Benefits	431.85	
Accidents on Duty	41.80	
Group Life Insurance	5.60	
Dues and Assessments Military Service	59.40	
Sundry Refunds	7.18	
Total payments for month		545.83
Bal. on hand Aug 1, 1918		$3,984.94

Membership June 30, 1918		762
New Members July	1	
Resignations	18	
Decrease		17
Membership ending July 31, 1918		745

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BUY WAR SAVINGS STAMPS

Electric Generation

The many changes and additions to the 60 cycle system in the past few months have made necessary an almost complete revision of the one line diagrams in use in the Operating Department. This work has been completed and the revised copies were sent to the several departments interested on August 5th.

❖

The work of marking switches and apparatus in the several electric stations of the Company and also in the substations of some of our largre customers is nearly completed, and is making it possible for the Operating Department to speed up their work considerably which brings us nearer the goal of absolute continuity of service to our customers.

❖

Due to the river deepening through the City which necessitates keeping the west half of the river bed dry, it has been necessary to close down Station No. 2-A for the summer. The Electric Construction Department is taking advantage of this opportunity to make some much needed repairs, one of which is the installation of an additional protective relay called the Ricket System, installed on the generator leads to protect the system from internal generator disturbances.

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The increase in 4150 volt distribution at No. 34 Station due to the three new circuits to the new Bausch & Lomb plant is being taken care of by tapping two 4150 volt tie lines, Nos. 302 and 304, between No. 5 and No. 6 Stations. No. 302 was tapped on July 21st, the section between No. 5 and No. 34 Stations retaining the original number, and the section between No. 34 and No. 6 Stations being changed to No. 305. The changes to No. 304 tie line will be completed during the the current month.

Gas Manufacture

During July, 8,854 tons of coke were produced, 3,650 tons were used in gas making operations and 9,034 tons were sold, the difference being taken from stock accumulated during previous months.

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The screens and distributing conveyors in the domestic coke building are complete and in operation, thereby giving the coke sales department the benefit of the full capacity of the lines.

❖

The old ammonia still has been removed from East Station and reassembled at West Station as an auxiliary ammonia concentrator. Also a 20,000 gallon ammonia storage tank has been moved to West Station, thereby doubling the storage capacity for concentrated liquor.

❖

The productivity of the Gas Department has changed very materially since the advent of the new plant. Whereas formerly 85% of the gas produced was water gas which contains only one auxiliary product, viz: water gas tar, now 65% of the gas is coal gas involving the by-products of coal distillation. The following tabulation illustrates a typical month's operation, during which time 130,381,000 cu. ft. of gas were scrubbed for light oil producing 46,952 gallons.

Gas Coal Used	12,013.5	tons
Coal Gas Made	130,323,000	cu. ft.
Coke Made	8,853.7	tons
Ammonia Made	66,155	lbs.
Coal Tar Made	175,442	gals.
Water Gas Made	81,319,000	cu. ft.
Coke Used	1,345.6	tons
Gas Oil Used	324,599	gals.
Water Gas Tar Produced	25,000	gals.

Company Men in Service

Private Harold R. Swanton, formerly of Sta. No. 3 and Sta. No. 5, was the first employee of the Company to die in the Service of the Country in the present war. Private Swanton was a member of the United States Naval Reserve Forces at Camp Logan, Texas, and there lost his life through accident.

The Company Honor Roll still grows. The following list contains the names of the men who left us in June and July to enter the different branches of the service.

ARMY

Samel Butera	Tony Miceo
Frank Cilaca	Tony Nick
Samuel J. Cohen	John O'Keefe
Ellis Cornell	Frank Pelucosie
Norman Davidson	S. Presulto
James DeJohn	Wm. Quetchenbach
Archie Gardiner	Roy J. Rodell
Frank Gunther	R. Russo
Leo F. Klein	Charles Simon
Angus Mackay	Wm. Spellman
Thomas Melfi	James Sweetman

John Ulrich

NAVY

David Alloway	Anthony Haldrick
Andrew Brostrom	Oswald Kirchner
Patrick Byrne	John Muller
James Casey	H. Shults
James Clifford	Harold Swanton
Brayton Daniels	Charles Tully
Frank Kennedy	McKinley York

Samuel S. Amdursky, *D. P. M. R. Bureau of Mines*
Leonard I. Hall, *Y. M. C. A. Service*
Roy Darron, *U. S. Naval Academy.*

Aviation Repair Depot No. 3,
Montgomery, Ala.,
Aug. 7, 1918.

Dear Mr. Fisher:

Quite a space of time between letters but it couldn't be helped.

In my last letter I think I mentioned working in the Camp Library. I was getting along so well they wanted me to stay for the duration of the war. The work is interesting. I got so I could classify any book. In the meantime the 4th Regt. M. M. moved across, leaving me behind so I made up my mind to get in some aviation field. I was transferred down here last Sunday. It's some hot, about 100° in the shade and no shade.

We live in barracks, well lighted, all porches and windows screened, fine shower baths, up-to-date plumbing, and stationary wash tubs. Each man has an individual clothes closet.

There are nine machines flying now. They are up all day long. This is a fine country for flying. The ground is just as level as can be.

There are large machine and woodshops under construction. At this field all the repairing and overhauling will be done, so in about a month's time we will be up to our neck in work.

In Augusta, Ga., I visited the Light Co., but I can't say I liked it very much. In Charlotte I visited the Company and met Mr. Collins who knows Mr. Searle very well. He showed me around but it will never touch the R. R. & Lt. Co. I also met a Mr. Moss, Sales Manager for the Roberts, Mander Stove Co. of Philadelphia. He knows Mr. Hutchings very well. Of all the places I've seen, they can never touch Rochester.

That's all the news now. Regards to all the girls and boys. My address is on the envelope. Kindly send me the magazine.

I remain, as ever,

J. A. McDermott.

33 Co. 152nd Depot Brigade,
Camp Upton, N. Y.

My dear Mr. Lungaard:

I began a letter to you about a week ago and had one whole paragraph completed when I was interrupted and this has been the first opportunity since.

I was very sorry to have pulled out so abruptly for Pittsburgh but things have come so thick and fast since then that regrets have no place in my daily economics. It's a case of from 5:30 to about 9:30. Today has been about the lightest in respect to work which I have had so far.

I was called very hastily from my work at the training school at Carnegie Tech. by the draft board. My C. O. wired them for a ten day delay to complete my induction into the service but it was denied supposedly owing to orders, but some of the other men at school had better luck with their boards.

This camp is a pretty good one and I haven't kicked on any of the work. I had a bad run of luck my first week here. We came in on a Friday afternoon and Saturday I was among the first selected as K. P.—kitchen police—by reason of being at the head of the line. We worked hard, washing pans, tables, boilers, floors, etc., quite impartially. Our day was unusually long as we didn't get any time off at all.

Usually K. P. gets two or three hours off afternoons. Next day was Sunday and Monday I again drew a blank—Detail to remove the top soil of a gravel bed, using pick and shovel all day. I made myself especially useful hoisting the larger stones into the wagon. Our grub was fair. Methods or better yet, lack of them for cleaning mess kits made things sort of distasteful but we kept so busy we had little time to brood over things, which was a good thing for us.

We have had wonderful weather here. The sunrise is glorious and sunsets are wonderful. The air is clear and the whole thing seems like a big vacation.

The day after the Fourth my "luck" seemed to change. I was appointed "Acting Corporal" and the day after was asked if I cared to be considered for the O. T. C.

Recently I have heard that the Personnel Dept. here will not allow any chemically trained men to leave camp in anything but chemical service. I may be an exception, maybe not. I have taken hold of the work here in good shape and I like it. It is fun drilling. It's more fun drilling the other men. We (some sergeants, corporals and acting corporals) all had special drill today by Capt. Bentley, C. O. of this Co. Also we had wigwag signal work and each man had a chance to drill the rest for two minutes. I had an opportunity to exercise some men this afternoon and liked it. Also had a nap which was badly needed. Had had about 15 hours sleep in the past three days. Sunday I was corporal of the guard and stood 24 hours guard duty. Two hours on, two hours off and two hours at rest but ready for action. The guard is principally a protection against fire.

Most of the men have been shipped to Camp Dix. Only about one-third of our 400 men are left. Some have been given special duty as clerks, stenos., auto-mechanics, etc., filling companies ready for overseas service.

My immediate hunch is that we will be kept here to break in the next gang of rookies that comes in. At least till we are called elsewhere for special work. I am glad to be giving my services any place for the good work. I must stop now as it is late. Thank you again for your letters. They will not be abused nor prove much exaggerated. I'm going up with even breaks.

Best wishes and regards.

SAMUEL J. COHEN.

Camp Johnston, Fla., July 21, 1918.

Dear Mr. Patterson:

It will probably be of interest to you to know that my efforts to obtain a commission have finally brought the desired result.

Last night I was summoned to Headquarters and handed a telegram informing me that I was appointed a Second Lieutenant, Quartermaster Corps, National Army, and ordering me to New York City for duty in the Reclamation and Conservation Service. As soon as I can be discharged from here, I will head for "God's Country." I expect that will be about Tuesday. I had applied for admission to the Officer's Training School to qualify in the Finance and Accounting branch. The direct appointment without attending the school was a very agreeable surprise, I assure you.

I don't know how I can ever thank you and Mr. Russell enough for the letters of recommendation you sent to me. I used them in applying for training. They certainly brought results far greater than I ever anticipated.

As you probably know, the Government has taken up conservation, reclamation, renovation and repair of clothing and equipment of all kinds. Nothing is going to be wasted. Tin cans and papers, rags, bones, fats, junk of all descriptions and everything that has or will bring any value will be conserved. All over the country, warehouses are being used in this work. I expect my duties will be of an accounting nature. I'll know more about that part of the appointment after I report to the Depot Quartermaster at New York for duty.

It sure will be a treat to get within calling distance of Rochester once more. Down here the charms of the Sunny South have long since ceased to be charms. The hot weather has set in with a vengeance. After the time I've spent here, the hottest day at home will be a balmy spring day in comparison with some of ours. It is very nice in the winter time but now it is a thing to be endured. I prefer the North, thank you.

Please inform the Mailing Department that I am leaving here so that the magazine won't be sent here in vain. I'll send in my address as soon as I am permanently located in New York. I always enjoy the magazine and would very much like to continue receiving it each month.

Training here in all branches of Quartermaster Corps work has certainly taken on the aspect of intensive training. Speed and thoroughness are the key-note. The intentions are to lick the Huns, and it sure is going to be done in a very complete manner.

A nice steady rain is falling. It started about four o'clock. It might rain for several hours here and within thirty minutes after it ceases, there is no trace of it on the surface. The ground is so sandy, the water soaks right in. Mud is unknown and boots or rubbers only thing in favor of the place.

Again thanking both you and Mr. Russell for the great favor you rendered me and hoping I may soon express my thanks to you both personally, I am

Gratefully yours,
L. G. KNAPP,
2nd Lieut. Q. M. C., N. A.

Medical Attention to Injured Employees

The following letter has been sent to all Superintendents, Foremen and Assistant Foremen:

Dear Sir:

Considerable delay in giving prompt medical attention to injured employees has occured in a few recent cases of injury, and to eliminate such occurrences in the future, please familiarize yourself with the General Order on the handling of accidents, a blue print copy of which is filed in your department.

The telephone operators can locate Mr. Fred H. Klein, Mr. Charles Royce, or the undersigned on short notice, and in the great majority of cases these men can get a physician on the scene of the accident more promptly than the department concerned.

If an emergency requires you to call a physician yourself or to administer first aid in anything but the most simple accidents, Mr. Klein is to be promptly notified, without waiting to report to your foreman or superintendent.

Help us to prevent the serious consequences of accidents by co-operating in these details.

F. W. FISHER,
Employment & Safety Manager.

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Industrial, Athletic and Recreational Association

Sixteen prominent manufacturing firms of the City of Rochester formed an association in the Spring of 1918, the object of which is to foster clean sport. Our Company is a member and individual memberships are being received. The following notice relative thereto has been posted on the Bulletin Board:

Industrial, Athletic and Recreation Association of Rochester.

The Rochester Railway and Light Company is a member of this organization which gives every individual employee of the Company the privilege of joining.

Various athletic and recreational enterprizes are and will be fostered by the Association such as baseball, tennis, bowling, dancing, theatre parties, etc.

The membership fee is twenty-five cents. Each member receives a membership card and a handsome button or pin, and will be given reduced rates to practically all functions.

Full information, cards, buttons and pins can be secured from W. C. Gosnell, Paymaster and Superintendent of the E. B. A.

Recent Company Accidents

Mr. Sam Scipione, a coal handler at West Station, dropped an iron plate which he was moving and injured his foot.

Mr. Dominic Nardone, a laborer at the Gas Works, while pushing a loaded wheelbarrow was injured by his hand coming in contact with a moving cable.

Mr. Ivan K. Simpson, a messenger in the Mailing Department, caught his hand in an electric clothes wringer, bruising two fingers.

Mr. John V. Fitton, a switchboard helper at Station 6, while cleaning a Railway Rotary, slipped off the base of the machine and fell to the floor bruising his hip.

Miss Florence McVea, an operator in the Telephone Department, scratched her wrist on the point of a lead pencil when reaching for a cash tube handle.

Mr. E. Pixley, a handy man working at Station 5, fell from a ladder injuring the second and third fingers of his left hand.

Mr. Leo F. Klein, patrolman, was struck by a motorcycle at Front and Andrews Streets and knocked down. His right leg was cut and bruised.

Mr. Edward Schuler, an iron worker at East Station Gas Works, injured the big toe of his right foot. An I-beam being moved from the stock pile slipped and fell on it.

Mr. C. F. Whiting, a coke handler at West Station, was caught in the chain drive on the shaker screen, injuring the first and second fingers of his right hand.

Mr. Bernard Cahill, a groundman in the Line Department, while inspecting a tie line from station 4 across the Genesee River at the New York Central Railroad bridge, was injured by a cinder from a locomotive lodging in his eye.

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THE BEST SAFETY DEVICE IS THE CAREFUL MAN.

Personals

Vice President and General Manager
James T. Hutchings

Every employee of this Company will be exceedingly gratified by the announcement that our much admired and respected Vice-President and General Manager, James T. Hutchings was elected a director of the Company in the place of Mr. Alfred H. Smith, at the meeting of the Board of Directors held in New York City, August 20th.

Mr. Smith was formerly President of the New York Central Railroad Co. and is now Regional Director of Railroads under Secretary McAdoo.

Mr. Frederick S. Raines, of the Balancing Department, spent a week at Canandaigua Lake.

Miss Pearl Ludwig, of the Balancing Department, had a very pleasant trip to the Muskoka Lakes, Canada.

Miss May Bosche, of the Engineering Department, spent a week's vacation in New York City.

Mr. Leo J. Sullivan returned August 5th from a month's vacation and reports a fine time.

Mr. Frank Kennedy, of Station 5, has enlisted in the Navy and is now at Great Lakes Training Camp.

Miss Alice M. Baker, of the Billing Department, has returned from a very pleasant trip to Old Orchard Beach, Maine.

Mr. Edward Herr, of the Addressograph Department, on a recent fishing trip to Buck Pond, caught an 8 pound Muskalonge.

Mr. Elmer W. Gardner, of the Drafting Department, has enlisted in the Army and is stationed at Fort Meyer, Virginia.

Miss Emilie Klinzing, of the Stenographic Department, has returned from a vacation spent among the Thousand Islands, Canada.

Mr. Frank J. Keehley, of the Addressograph Department, has returned from his vacation, part of which was spent at Atlantic City.

Mr. F. M. Chapin, of the Auditing Department, spent a part of his vacation on a canoeing and camping trip up the Genesee River.

Announcements have been received of the marriage of Miss Carruth Thompson of Toronto to Mr. Wihtred Cook, formerly of the Industrial Sales Department, on July 6, 1918.

Mr. Julian H. Harvey, Director Public Safety Committee Rochester Chamber of Commerce, addressed the men at Station 3 and West Station Tuesday August 8, on Accident Prevention.

The Binghamton Heat, Light & Power Co. held an Accident Prevention meeting on July 23rd, which was addressed among others by Mr. F. W. Fisher, Employment and Safety Manager of the Rochester Railway & Light Company.

Miss Mildred M. Stebbins of the Contract Department was married to Mr. Hugh William George of the Merchants National Bank, Detroit, Michigan, August 11th, 1918. Mr. George expects to enter the service shortly.

Sergeant P. B. Seymour, formerly of the Auditing Department, and later with Consulting Engineer A. Parshall, is now in France with the Headquarters Company, 108th Infantry.

Mr. A. Parshall, Consulting Engineer, called on friends in the Company recently. "Gus" has his hands full of special appraisal work for several Public Utility Companies.

Miss Rosalind Eaton, of the Accounting Department, entertained several of her friends in the Company Saturday at her home at the Lakeside. Swimming and a shore supper was enjoyed.

Second Lieutenant G. W. Goddard, A. S. M. A., formerly of the Appliance Department, called on friends in the Company a few days ago. He is now Chief Instructor, assigned to Cornell University Military School of Aeronautics.

Vice-President and General Manager James T. Hutchings has been appointed a member of the State Advisory Board in U. S. Employment Service Organization and as such will assist in the Government Labor Distribution Program which became effective August 1st, 1918.

Miss B. Nanon Block has been engaged as assistant to Miss Emily Cutler in the Gas Manufacturing Department laboratory.

Mr. Alameth Kay, of the Engineering Department, spent his two weeks vacation at Honeoye Lake. Mr. Kay says those two weeks were the shortest in 1918.

Mr. Melvin D. Anderson, of the Industrial Sales Department, left August 14th for Ann Arbor, Michigan. Mr. Anderson has accepted a position at the University of Michigan as Instructor of Telephone Electricians of the National Army.

Messrs. Charles E. Morrison, General Manager, Mr. F. M. Kendrick, Adjuster, and Mr. F. B. VanDoren, Safety Engineer of the Utilities Mutual Insurance Co. called on friends in the Company during July.

Mr. Joseph F. Putnam, of the Auditing Department, has been appointed Administrative Fuel Engineer for Tompkins County by the U. S. Fuel Administration. Mr. Putnam is also teaching Electrical Engineering in Cornell University.

Mr. Melvin D. Anderson spent the first two weeks in July at his home in Grand Rapids, Michigan. Part of the time he went a fishing and the story he tells may be true, but it is a fish story anyway.

Miss Nelta Blackstock, of the Meter Reading Department, has returned from a vacation spent at Camp Altamont, Altamont, N. Y. Miss Blackstock was delegate from the Rochester Association to an Industial Convention of the General Y. W. C. A., held at the camp during her stay there.

Mr. F. J. Howes and Mr. F. W. Fisher recently made a trip via the New Barge Canal from Rochester to Fulton to investigate the use being made of canal water for power purposes. The trip was made in Mr. E. C. Scobell's motor boat, Mr. Scobell accompanying the mariners as far as Lyons.

Our Company family has been increased by the addition of two new members. Frederick H., Jr., son of Assistant Auditor and Mrs. Frederick H. Patterson, born August 13th, and Evelyn Mary, daughter of Mr. and Mrs. Edwin H. Fisher of the Line Department, born July 29th.

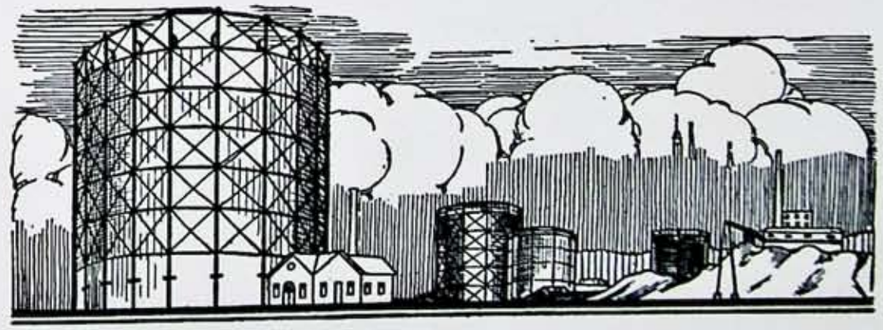
Vice-President and General Manager James T. Hutchings, was a speaker at a meeting of employers and their representatives, which was held at the Chamber of Commerce at noon Tuesday, August 7th.

The American's Creed

I believe in the United States of America as a Government of the people, by the people, for the people; whose just powers are derived from the consent of the Governed; a democracy in a republic; a sovereign nation of many sovereign states; a perfect union, one and inseparable, established on those principles of freedom, equality, justice, and humanity, for which American patriots sacrificed their lives and fortunes.

I therefore believe it is my duty to my country to love it; to support its constitution; to obey its laws; to respect its flag; and to defend it against all enemies.

—William Tyler Page.



The Du Bois Press of Rochester

Your Country

"And for your country, boy, and for that flag, never dream a dream but of serving her as she bids you, even though the service carry you through a thousand hells. No matter what happens to you, no matter who flatters you or who abuses you, never look at another flag, never let a night pass but you pray God to bless that flag. Remember, boy, that behind officers and government, and people, even, there is the country herself; your country, and that you belong to her as you belong to your own mother. Stand by her, boy, as you would stand by your own mother."

Edward Everett Hale.