

NEW ENGLAND

TELEPHONE TOPICS

DO NOT pray for easy lives:
Pray to be stronger men.

¶ Do not pray for tasks equal to
your powers. Pray for powers
equal to your tasks.

¶ Then the doing of your work
shall be no miracle. Every day
you shall wonder at yourself, at
the richness of life which has come
to you by the Grace of God.

—Phillips Brooks.

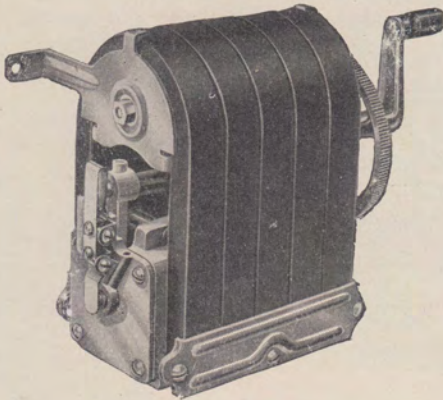
Volume IV

BOSTON, MASS., DECEMBER, 1910

Number 8



MR. MANAGER



This is the No. 48 Generator — one of the distinctive features of the

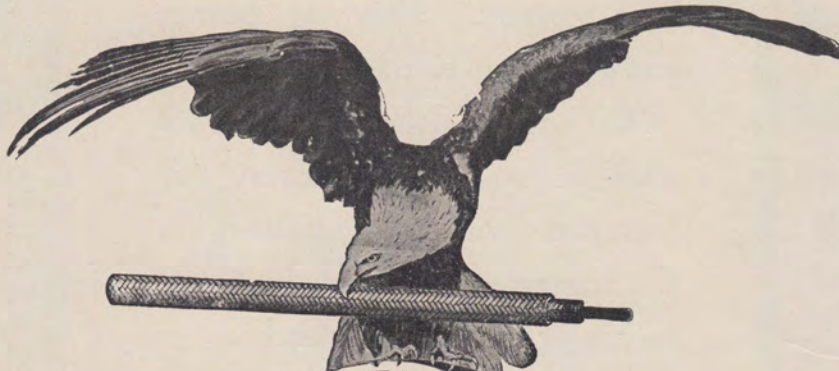
Western Electric

No. 1317 Magneto Telephone

It will ring 40 2500-ohm bells on a 30-mile full metallic line of No. 12 B. W. G. iron wire. It is unquestionably the most powerful generator on the market.

This is but one reason why you should strongly recommend the No. 1317 set to every telephone buyer.

**Western Electric
COMPANY**



Rubber Insulated Wires
of Every Description

Telephone Wires
of All Kinds

Bay State Insulated Wire & Cable Co.

Main Office and Factory, Hyde Park, Mass.

New England Telephone Topics

ISSUED MONTHLY BY THE NEW ENGLAND TELEPHONE
AND TELEGRAPH COMPANY, AND DISTRIBUTED,
WITHOUT CHARGE, TO ITS EMPLOYEES AND
TO EMPLOYEES OF SUB-LICENSE
CONNECTING COMPANIES

Edited by Employees, for Employees

JUST BETWEEN OURSELVES

THIS is a pretty good world, after all. We hear a good many thoughtless criticisms at times and we think, perhaps, that the critics ought to inform themselves before complaining. But on the other hand, the great majority are disposed to be not merely just, but generous. For example, here's a voluntary contribution from one who previously had had occasion to kick. The writer lives in the suburbs of Boston:

I have had occasion to complain of service in the past. Now, I wish to praise. I have had excellent service during the last two weeks. Wish to extend thanks to operators, chief operator, etc.

And here's another, illustrating how valuable is our emergency work in bringing the public to an appreciation of what telephone service really means. Is was written by a Roxbury subscriber under date of December 3:

To the Superintendent of the Roxbury Telephone Exchange:

Dear Sir: On the evening of Friday, the second of December, I had occasion to call the hospital from here. It was a most urgent call, being a desperate attempt to secure the services of a priest for a man who was dying.

I called the Roxbury chief operator and explained the case to her, and she personally took charge of the call.

I desire to express (though very inadequately) my sincere appreciation and gratitude to her for the very efficient and courteous treatment which she accorded me at a time when such service meant much to several people.

Her very prompt work brought comfort to a family in their dark hour of sorrow, and I wish that she may know how sincerely they feel and appreciate what she did.

The writer recently had the pleasure of reading a batch of replies to letters sent out by managers to various subscribers, asking whether the service was good. If it wasn't, they asked for specific criticism and promised immediate correction. One would think such an invitation would have brought down an avalanche of kicks. On the contrary, however, the criticisms were in an almost negligible minority. Nearly every one took occasion to commend rather than to condemn. As an example of the kind of replies, I quote the following to the Lowell manager by a shoe dealer of that city:

Manager N. E. Tel. & Tel. Co.:

In answer to yours regarding satisfactory service, I wish to say it is entirely so. Your operators are particularly painstaking and courteous, doing more than is expected of them. I have in mind the instance when my boy fell from a barn loft, breaking both wrists. It happened on Wednesday, when it is hard to find a

doctor. I 'phoned the family doctor. He was not in. I was distracted. Though there are a number of doctors in the city that I know, I could not think of a single one. It was then that your operator, who had instinctively divined my agitation and disappointment, asked me if Dr. So-and-so, mentioning a half dozen good doctors, would do. I don't know the young lady, though I feel everlastingly grateful to her. I mention this because I feel as a rule we are apt to take such service as our right or as a matter of course.

Doubtless, the operator who rendered this service has forgotten all about it. It was a part of the day's work and, to her, a trifling incident. But the subscriber didn't forget and, when the manager asked him how his service was, that little incident was the keystone that supported a high and generous appreciation. Here again we come back to our old friend, Emergency, and that prompts the query: "I wonder if all operators appreciate the importance of keeping the emergency rules fresh in their minds; if chief operators hold occasional fire drills in them?" I trust they do, so that in the *instant of need* they may not be weighed and found wanting. The next day or even the next minute may be too late. The only way to be ready to meet such a situation when it arises is to prepare beforehand — to occasionally refresh the mind so that when called upon to act it will act with mechanical swiftness, so to speak.

Here's one that ought to be worth quoting, by contract men engaged in selling farmer's lines. It was sent in from Baldwinsville, Mass. It would be somewhat farfetched to urge a man to become a subscriber simply because sometime he might want to catch a thief, but it does furnish a concrete illustration of one phase of the general protection value of the telephone.

By the way, contract agents are always glad to get unusual incidents of the value of the telephone. They say they are very helpful and sometimes serve to clinch a general argument. Send in some more, ye who have knowledge of such.

Two young men came from one of the adjoining towns to seek employment. Outside one of the factories where they visited were two bicycles, the property of the employees. Each of the two fellows took one and started to ride towards Athol. The police were notified of the theft, but the thieves had quite a start before the bicycles were missed. The police immediately called the operator and was informed that a farmer's line had recently been built and several telephones installed in the direction the thieves were supposed to have taken. One of the telephones was called and, as a result, the thieves were held until the arrival of the police.

Telephoned 100 Miles for Doctor

Here is another case of the resourcefulness of the telephone. A Springfield subscriber has a young child who was recently taken with an attack of colic about 11 o'clock at night. He was alone in the house and found it impossible to get any local physician to attend him quickly.

Then he called up a physician in Somerville whom he knew well, and received instructions by telephone as to what remedy to apply to relieve the child, which proved very successful.

The Somerville physician made no charge for his services and the subscriber saved \$1.35 by using the telephone, the toll to Somerville being 65 cents.

Telephone Invaluable in Accidents

An illustration of the real benefit, to say nothing of the convenience, of telephone service was recently given in Wells, Me.

G. A. Dixon, living some three miles from town recently had a telephone installed. It had been in the house only a few days when he accidentally cut himself very badly while at work in the fields. He was taken to the house and a call was put in for the doctor. In 23 minutes from the time call was made the doctor was at the house and checked the flow of blood.

About 10 days later Mr. Dixon's daughter, eight years of age, accidentally swallowed a walnut, the nut lodging in her throat. Trying to relieve the little girl in all ways possible, and finding she was growing worse all the time, another call was passed for the doctor. Eighteen minutes from the time the call was made the doctor was at the house and relieved the little girl of her suffering and, no doubt, saved her life, as it would have been impossible for her to have stood the strain and suffering she was subjected to but a very few moments longer.

Mr. Dixon was so much pleased over the benefit he considers his service has been to him that he called the manager, stating that he wished to inform him how much he thought of it. "Words cannot express my feeling towards the telephone, and you could not hire me to be without it," he said.

Mr. Dixon has always been a believer in telephone service and is more firmly convinced now than ever that it is invaluable.

Tarred Rope Used to Mend Telephone Line

The farmer's line between Conway and Eaton, N. H., has been causing the Ossipee Valley Company considerable trouble, due to its poor condition, as almost every storm knocks down a couple of poles and puts the line out of commission.

The farmers in this vicinity have been in the habit of repairing the line by using fence wire or anything which they might have handy, but during the past storm a farmer came across two sections which had fallen down and broken off a piece of wire six or seven feet long. He tried to find some wire to repair the line, but was unable to do so and substituted a piece of tarred rope which he happened to have with him in his wagon.

This sounds like a good old Maine yarn, but General Manager Leighton claims that these are facts and that the line worked in this way for over two weeks.

Dog Talked Over Telephone

The following is from a Middleboro paper:

It is generally admitted that an Irish terrier is an intelligent dog, but "Tucky" Morrissey, a telephone line inspector, has one named Patsy which he says has all kinds of dogs beaten. Tucky and Patsy are almost inseparable, but a short time ago the dog was left at home while his master was out in the country. During his absence Patsy wandered from his home to the telephone office and laid on the mat for a nap.

After Mr. Morrissey had his work completed he called the test operator to see if the lines were in working order. When Patsy heard his master's voice he awoke suddenly, jumped on a chair near the transmitter and began to bark. Tucky heard the dog and

said, "Hello, Patsy." The dog grabbed the transmitter in his paws and began to bark in mournful tones for his master, who was over 10 miles away. When Tucky returned that night Patsy was at the door of the telephone building waiting.

Night Operator Cool During Fire

On December 7, at 5.05 A. M., fire was discovered in W. B. Smith's dry goods store in Warren, Mass., in the building next to the telephone office. The night operator, James M. Holden, was awakened by the cry of "Fire" and at once telephoned to have the alarm sounded by hand, as he knew that the automatic alarm was out of repair. He then called the fire chief, the stable where the engine horses are kept, and as many of the firemen as had telephones.

At 6 o'clock it looked as though the building in which the central office is located would also be burned. By 8 o'clock the fire was under control, but was not out until noon. During this time the night operator tested the lines surrounding the burning building and, upon finding one out of order, called the wire chief at Palmer, who arrived in Warren at 7.52 and the line was working at 8.20. The night operator deserves much credit for his coolness and presence of mind.

Fire Gives Call on Switchboard

On Sunday morning, November 20, about 4.45, the night operator at Marblehead, Mass., was awakened by his night bell. When he reached the switchboard the bell had stopped ringing and no line signal was burning. Two or three minutes later he was again called to the switchboard, only to find that the bell was still silent and no signal visible.

He was somewhat perplexed, and as he started to return to his bed, thought he detected the odor of smoke. He went to the front of the office which looks out on Pleasant street, and discovered both flames and smoke coming from a building directly across the street occupied by the Colonial Bowling Alleys. He notified the fire department at once and the fire was extinguished with comparatively small loss. The wire chief was able to save the instrument, although it was somewhat scorched, but the fire made such progress that it was impossible to tell afterwards just how the line signal was given, but it appears that in some way the progress of the fire caused an intermittent loop-cross.

Telephone Linemen Help Train Dispatcher

A wreck of minor importance occurred on the Worcester, Nashua and Portland division of the Boston & Maine railroad, a short distance east of Nashua Junction, N. H., about 9 A. M., November 14. The accident resulted in a breakdown on the Western Union circuits used for railroad services and necessitated immediate repairs.

No telegraph lineman being available, the train dispatcher requested assistance from Wire Chief McMahon of Nashua, which was readily granted. The telegraph circuits were again available in about an hour and repairs completed about noon.

Aside from the pleasure of assisting the railroad and telegraph companies in this manner, the incident was reassuring as another indication of our preparedness for emergency trouble work.



CHRISTMAS DECORATIONS IN OPERATORS' RETIRING ROOM AT BACK BAY EXCHANGE

The Decorations Shown Here Illustrate What is Being Done by the Young Women in Many of the Central Offices. They Vie With Each Other in Making the Retiring Rooms Attractive, Particularly at this Holiday Season. The Exchange of Presents is always a Pleasant Feature of Christmas Day Among the Operators

ENTHUSIASM

A MAN might have honesty, health, ability, initiative, knowledge of the business, tact, sincerity, industry, and openmindedness, and without enthusiasm he would only be a statue. Enthusiasm is the white heat that fuses all of these qualities into one effective mass.

To illustrate enthusiasm: I can take a sapphire and a piece of plain blue glass, and I can rub the plain glass until it has a surface as hard as the sapphire, but when I put the two together and I look down into them, I find that the sapphire has a thousand little lights glittering out of it that you cannot get out of the blue glass if you rub it a thousand years.

What those little lights are to the sapphire, enthusiasm is to a man. I love to see enthusiasm. A man should be enthusiastic about that in which he is interested. I like to go to a ball game and hear a man "root" for the home team, and it never bothers me a bit, because I know that man has enthusiasm. He has interest. I would not give two cents for a man who works for money alone.

The man who doesn't get some comfort and some enthusiasm out of his daily work is in a bad way.

Enthusiasm is that thing which makes a man boil over for his business, for his family, or for anything he has an interest in, for anything his heart is in. So I say, enthusiasm is one of the greatest things a man can have. — HUGH CHALMERS in *Judicious Advertising*.

TELEPHONE REMEMBERS AND DON'TS

Remember there is a hat on your head when you enter a subscriber's residence.

Don't forget you have a pair of rubbers on your feet; if not, remember there is a door-mat on the stoop.

Don't examine a private library when all books can be found at a public library.

Don't forget to be courteous at all times to a subscriber, for then is the time the subscriber gets the first impression of the company, which is generally lasting.

Remember always to notify a subscriber when a trouble is cleared, it gives more satisfaction.

Don't tell a subscriber that you don't know what the trouble is, it gives a subscriber the idea that you have yet to learn the telephone business.

Don't forget to report a subscriber's complaint, it only takes an effort.

Don't ever enter a subscriber's premises with a grouch on; always sit down on the step and let it wear off. Remember you will feel better yourself.

Don't forget to speak well to a subscriber of a fellow who was there before you. It hurts the other fellow and does not help yourself.

Remember to be a good listener when a subscriber is speaking to you.

Subscriber — "Information, I want to get Mr. Jones. I don't know where he lives now; he died a few days ago."

NEW RATE SCHEDULE FROM TRAFFIC POINT OF VIEW

How the Operating Side of the Telephone Business, with its Hundreds of Young Women at 51 Switchboards, Answering Over Half a Million Calls Daily, Has Been Affected in the Metropolitan and Suburban Districts

THE papers presented at the November meeting of the Telephone Society of New England, bearing on the Traffic work in connection with the rate changes in the Boston Division, are printed below. While it has been necessary to omit some of the details, the papers are essentially intact and will give the readers some idea of the vast amount of work which has been thrown upon the Traffic department for the past three years and will continue for a year or more to come, relating to the studies and problems of administration in connection with the change in rate schedules. The problem and the methods pursued in solving it are without a parallel in the history of telephony.

Some Phases of the Work Carried on by the Traffic Department in Connection with the New Boston and Suburban Services and Previous to the Time Contracts under the New Schedule Were Accepted by the Company

By B. J. BOWEN, Traffic Engineer

On March 28, 1908, the Massachusetts Highway Commission, in a letter to the Company, recommended that careful studies of the traffic over the company's lines be made by the company and under the supervision of the engineers retained by the commission.



B. J. BOWEN, Traffic Engineer

At the same time they recommended that an inventory of the company's physical plant be made and this inventory was started in the same year of 1908. Further action in the matter of the traffic record was, however, not made until early in 1909, when, under the supervision of the commission's engineers, the Traffic department made a complete record of traffic with its distribution within the

limits of the metropolitan suburban territory.

However, early in 1908 it became evident to the company's officials that a record of traffic from all classes of service in all exchanges, together with its distribution to terminating points, would be required for their own consideration and study. Accordingly, a record was made and tabulated. This 1908 record proved to be of great use to the company and later on was used in connection with the 1909 record by the commission's engineers, as mentioned in their report. For our own purposes it was of great value in working out the best method of taking such a record and compiling the data, resulting in increased efficiency and

accuracy in the making of the 1909 record for the highway commission.

Speaking now of this latter record and quoting from the instructions regarding it: "It is proposed to obtain a record of traffic under the various classifications of service from which can be obtained average calling rates and a distribution of the traffic within the Boston division. In taking the record, all classes of service will be observed and completed calls and their destination recorded. The observations must be made with as little disturbance of the traffic as possible and with as great economy as will be consistent with accuracy. A special form for the recording of the calls will be used under the supervision of an inspector. Each inspector will supervise the observations in several offices and will use every means to insure the accuracy of the record."

A special corps of inspectors was organized and these inspectors were personally responsible for the accuracy of the records taken in the offices under their supervision. The special tickets were made by the operators under the supervision of the inspectors.

The special tickets were recapitulated and the distributed traffic tabulated for each class of service in each exchange and these tabulations were reduced first to the basis of one day and then to the basis of one year.

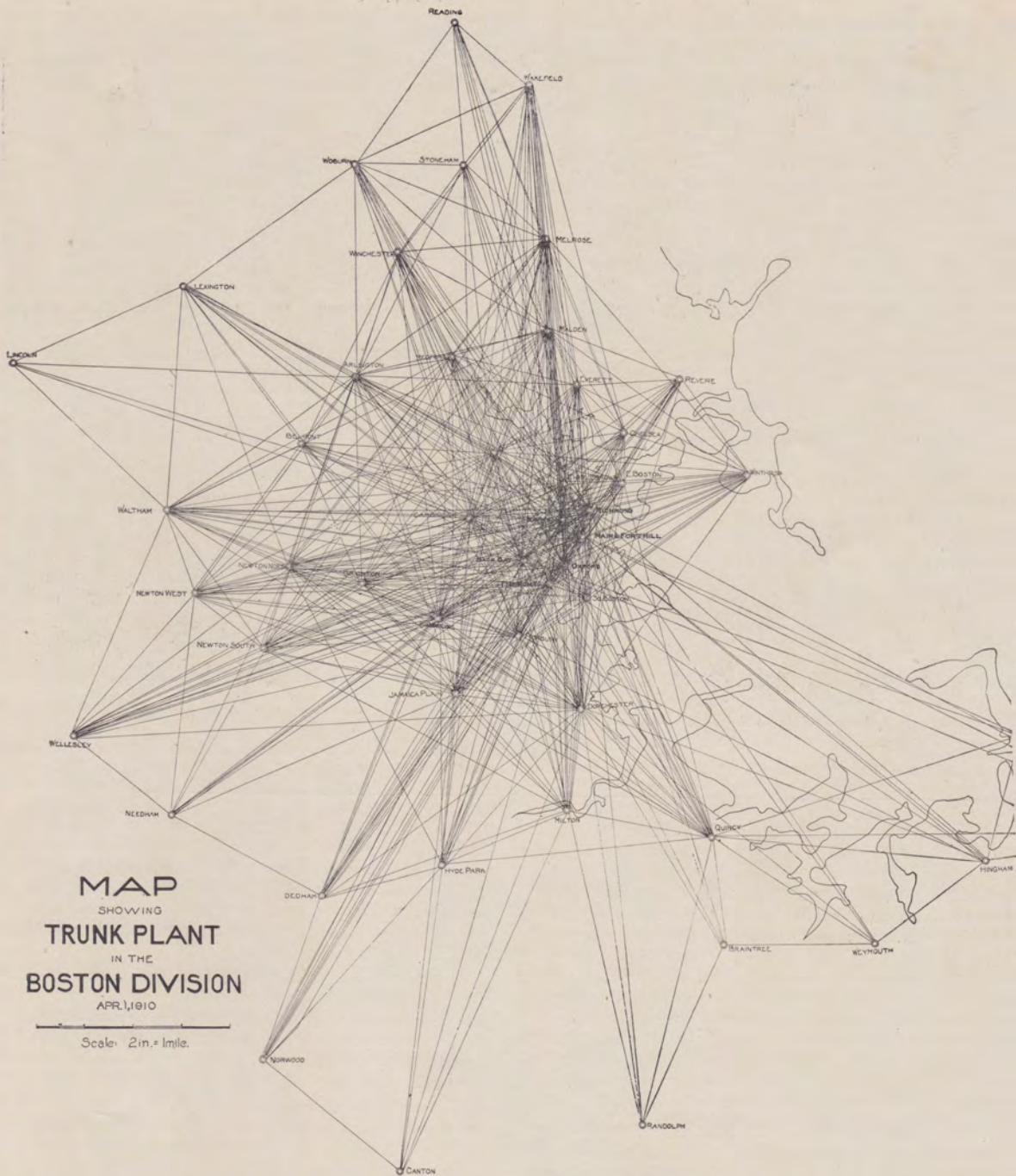
Work Involved of Great Magnitude

The magnitude of the work is shown when you consider that there are 51 exchanges with 30 different classes of service originating between 500,000 and 600,000 calls a day, of which number about one-half are trunked to exchanges other than the one in which the calls originate. The work required approximately 1200 tabulations, each one showing the traffic distributed to the 51 exchanges; there were approximately 22,660 distributions, and to obtain the final results over 82,000 prime computations were required, each computation being made in duplicate, making a total of 164,000 prime computations.

On this work were employed ten inspectors and 26 comptometer clerks, with four stenographers.

To insure accuracy all results were compared with the peg count, with the daily record of measured service calls and with the record taken in 1908. Whenever any doubt existed as to the accuracy of the record a new record was taken and I do not need to tell you that we made use of every possible means to insure accuracy in our figures. The work was also supervised while in process by representatives of the highway commission's engineers.

Upon this record of traffic is based all traffic figures and estimates contained in the report to the Massachusetts Highway Commission on telephone rates by D. C. and William B. Jackson, which report submitted a proposed schedule of rates for use in the Boston and suburban district. The record has also been the basis of a number of special studies made for our own officials and for the highway commission, and on it has been based our estimate of switchboard and operating requirements under the new services.



This Cobweb Map Represents the Trunk Line Routes Connecting the 51 Exchanges of the Metropolitan and Suburban Districts. Each Line on the Map Represents a Group of Lines and an Aggregate of 6635 Trunk Lines. Hull and Cohasset are not Shown, Although Both Towns Are Affected by the New Rate Service

All of you know that the new services have made necessary the addition of a very considerable amount of switchboard equipment and of cable for subscribers' lines, which otherwise would not be required. This situation has been brought about by the fact that the new services provide only one and two-party lines for

suburban flat rate services, whereas before we had four and six-party lines, and the introduction of the district plan with which you are all familiar. The first results in more subscribers' lines for the same number of stations, and the second results in more switchboard positions for the same number of calls, due to the fact



DISTRICT TRAFFIC CHIEF METROPOLITAN AND SUBURBAN DISTRICTS

Standing, Left to right—Top row, Archibald L. Cameron, Somerville District; James F. Dwinell, Second Central District; Arthur G. Ledwith, Malden District; Francis D. Field, Jr., Quincy District; Sitting—Bottom row, John H. Shea, First Central District; John H. Gordon, Newton West District; William F. Crowell, Jamaica Plain District.

that under the new services trunked traffic will require to be ticketed and timed, which was not necessary under the old service.

On the appearance of the Jackson report in February, 1910, it became necessary to at once figure the effect of the proposed services on our plant and to make recommendations as quickly as possible for what new plant would be required, and on March 18 we submitted a preliminary estimate of switchboard equipment required to be placed in exchanges to meet the new services, and this preliminary estimate was followed as fast as possible with detailed recommendations which later on were modified to meet the services as finally recommended by the highway commission.

Three Traffic Recommendations in Jackson Report

The Jackson report contained three recommendations affecting equipment. First, the reduction of multi-party lines; second, the so-called district plan; third, the introduction of divided ringing. It was necessary to estimate the effect of these three things and, in addition, the effect of the changes in the rates on the traffic, of which we had a complete record under the old services, and having estimated the effect on the traffic, to figure carefully the plant requirements to take the lines and traffic on the new basis.

In making this estimate we had no precedent to guide us.

Our regular estimates of switchboard requirements are based on an estimate of one, two, or three years'

growth of present conditions, present services, present calling rates, present operators' loads, etc.; but here was an entirely different proposition. Present services and present calling rates we knew, but these were to be changed to new services and new calling rates, and a toll charge was to be made on traffic which, under the old services, was not made.

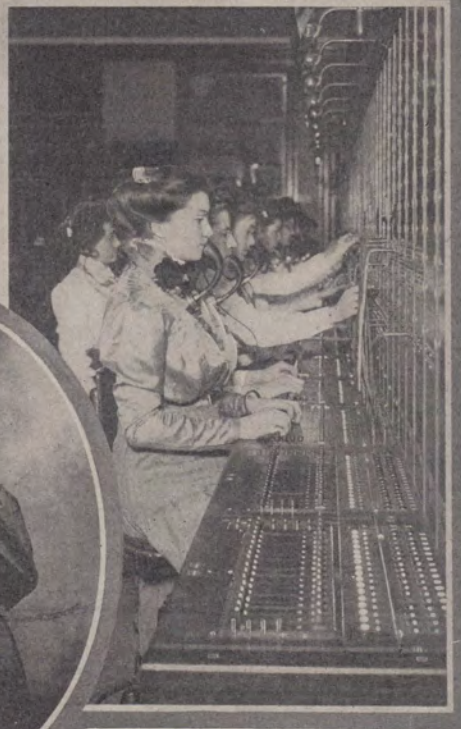
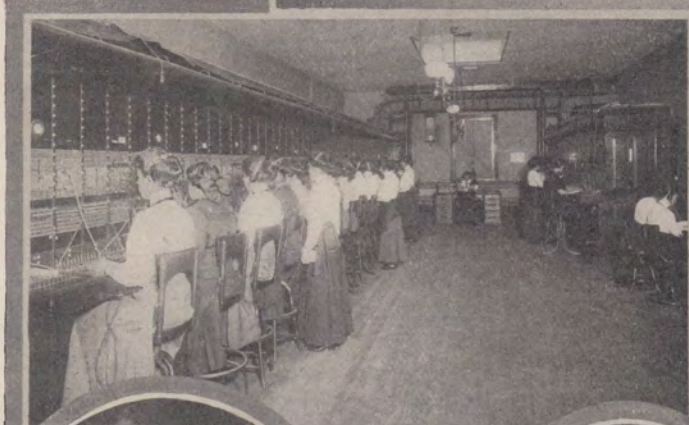
So it became necessary to first study carefully the probable action of our subscribers in changing from the old services to the new services. This was made the more difficult because there were five separate classifications of districts, with five schedules of rates under the new services.

Generally speaking, the characteristics of the offices in any one classification were sufficiently alike so that a plan of distribution for that class could be made and applied to all offices under that classification.

Taking up any one of the old classes of service it could be readily determined into what new classes of service it would distribute. For example, the four-party residence suburban service would break up into one-party flat, two-party flat, two-party measured and four-party coin box services. It was necessary to consider all these classes of service because, for instance, if we assumed that all four-party flat subscribers would change to the new two-party flat service it would be more than probable that some subscribers would take special lines, in which case we would be short of multiple in our estimate; or, if a large proportion of these



MISS BERTHA M. ALLIS
Somerville Chief Operator



MISS ISABELLA McCALLAN
Dorchester Chief Operator



MISS GERTRUDE M. GLENNON
Malden Chief Operator

THREE BUSY OPERATING ROOMS AND CHIEF OPERATORS

At the top is the Somerville Operating Room, one of the medium sized Offices to be largely affected by the new service. The Dorchester Operating Room, where the equipment has been increased because of the new service, shown in the center. Malden Operators snapped at the busy switchboard where thousands of messages are handled daily are shown at the bottom.



MISS SARAH E. MCINTYRE,
Roxbury Chief Operator

MAKING ADDITIONS TO THE SWITCHBOARD AT THE ROXBURY EXCHANGE

This Picture is Particularly Interesting Because It Shows Workmen Increasing the Facilities Without Interfering with the Efficient Service or Affecting the Complicated Mechanism of the Switchboard

subscribers changed to measured service, we would be short of switchboard to handle the traffic.

The distribution to the new services was then made after a careful study of the calling rates under the old service, the annual cost to the subscriber under the old and under the new service, and the trunking features, all being modified by the commercial reasonableness of the assumptions. Care was taken in reaching the final figures to so distribute as to provide a reasonable insurance against our estimate when reduced to switchboards being wrong, due to subscribers refusing to follow our well designed plans. To illustrate, should a larger per cent of old flat rate subscribers change to measured service than our estimate assumed, it will be done with a reduced calling rate which will entirely compensate for the operating difference between flat and measured service calls.

All of these things and many others had to be considered and such allowances made as would result in providing sufficient switchboard to care for the new conditions and yet not provide more than was needed. The problem was worked out service by service and exchange by exchange.

We then had to treat the very complicated problem of the trunked traffic. The new services provided a toll charge on all calls trunked out of the district. To collect this toll charge requires that each call be ticketed and timed, which materially decreases the number of calls an operator can handle and consequently increases the number of switchboard positions required.

On the other hand it is undoubtedly true that the effect of this toll charge will be to reduce the number of calls made and it is also probable that the reduction will be considerable at first and that later the number of calls will gradually increase again. Again, from those exchanges getting a reduction in the rates to Boston we may expect an increase in the traffic.

Many Conditions Have to be Considered

There was nothing to guide us in estimating the trunked traffic under the new conditions. The few cases on record of a toll charge being placed on free trunked traffic were under different conditions and for small amounts of traffic. In considering the matter a number of important things had to be weighed one against another to arrive at a final result. To illustrate, it may be assumed that under the old service there was a large amount of useless traffic developed under the free trunking plan, which traffic can be done away with by the subscriber without loss; that the amount of this useless traffic was greater under flat-rate service than under measured service; that between business and residence service, other things being equal, the proportionate decrease in trunking will be greater from resident stations; that the decrease in trunking will be greater as the toll charge under the new service increases, and that the margin between the initial yearly charge under the old service and the initial yearly charge under the new service will be a very large, if not the largest factor affecting the trunking

under the new services. In this way, weighing one probability against another, the probable trunking conditions of the new services were worked out.

Estimating the Effect of Probable Growth

Having thus established a basis of change of the old service to the new, we estimated the effect of the probable growth in stations. There was a normal growth and there was the extra development due to the new rates, which we have every reason to expect. These estimated growths were translated to the terms of the new service and we were then ready to figure the number of positions and multiple lines required in each office to care for the old stations on the new service and the new stations under the new service.

A large amount of careful study was put into this estimate because we could not afford to go very far wrong. It meant an investment of a large amount. If our figures are insufficient it means that subscribers cannot be connected under the new service or, if connected, our operators will be overloaded and bad service will result. We have claimed that the new services will give the subscribers better service. If it is worse service, we discredit the entire scheme. On the other hand, if we have been over-liberal, we are putting the company to unnecessary investment at a time when the investment should be conserved, due to the uncertain revenue features of the new rates.

Our estimate called for additional equipment in practically every exchange in the metropolitan and suburban districts. The multiple jack requirements alone amounted to 150,000 jacks. In three offices, namely, Winchester, Winthrop and Hyde Park, it is necessary to install complete new relay equipments, as the capacity in subscribers' lines of the existing boards is insufficient to take the lines on the new basis.

There are two matters in connection with switchboard equipment for the new service schedule that I want to speak of here. One is directly connected with the trend of the new service towards message rate service and is the use of central office meters for the registering of message service calls. The use of meters increases the number of calls an operator can handle, approximately in the ratio of 1 to 1.5. Unfortunately, so far, these meters will work on a line only and will not differentiate between the stations on a party line. Nevertheless, the tendency towards special and private branch exchange lines in metropolitan and the larger suburban offices is such that we will be enabled to make a substantial saving in switchboard sections, floor space and operating costs. These meters have been called for in all metropolitan exchanges and, in fact, without them we would have had to call for several more sections in each of five of the metropolitan offices. In metropolitan offices the meters will also be placed on all other lines on the board and we will be enabled with their use to get an accurate day to day record of traffic that will be invaluable in determining the effect of the new rates and services.

The other matter is associated with the divided ringing feature of the new services and is the contemplated replacement of the present manual ringing incoming trunk circuit with the semi-selective machine ringing trunk. These circuits do away with the operator on the trunk board ringing the subscriber and the ringing is done automatically. The introduction of these circuits will mean fewer switchboard positions, reduced operating costs and improved service.

It may be permissible to say here that the operating men expect with the improved equipment to operate more efficiently, but that with the bulk of our stations on special and two-party lines they also expect to give the subscriber better service, and there is no doubt but that they will do it.

These things I have been telling you about are but preliminary and they are no doubt well enough if they have been well done, but the big job is the actual carrying out of the tremendous task of putting the districts on the new basis. This work is now well under way and I am glad to make way for the men actually on the job.

The Application of the New Services in the Boston Division as Concerns the Traffic Force in the Field

By L. C. WHITCHER, Superintendent of Traffic, Boston Division

ON being informed that the new rates and services were to be a reality on a certain date, the three division superintendents got together and with the traffic engineer and the division contract agent mapped out a line of action. It was agreed that in putting the exchanges on the new basis it was imperative that the operating be disturbed as little as could be, that the subscribers be given service under their new contracts with as little delay as possible, and that the work be carried on rapidly.

The intent of our plan was that the three operating departments would work in unison throughout the progress of the work in such a manner that the pressure for the new service at any point would at no time be too great for Plant and Traffic to properly handle and at the same time the Commercial department would be able at all times to utilize its full strength.

It was necessary to have such a plan; the entire proposition had to be viewed broadly and a system worked out and set up that would effectively serve the purpose of all departments and accomplish the ends desired. The division had to be treated as a whole and the conditions in a particular section, or at one or two exchanges, not allowed to control the entire procedure, but considered separately and treated specially.

The plan as mapped out has been faithfully executed. It is true that the severest test has not been applied, as an active canvass has not yet been necessary; but when that time comes I have every confidence that the contract work will be handled and directed so that the pressure at any point will not be too great for Plant and Traffic to properly handle.

To more closely bind the departments together we agreed on a working committee of three, one representing Plant, one, Commercial, and one, Traffic, to give a necessary portion of their time to the direction



L. C. WHITCHER

Traffic Superintendent, Boston Division

of the work, following out the general plan. These men meet daily, confer and advise with each other and work out the details. Speaking for the Traffic side at least, I can say that this committee might be called the eye of this particular work; it looks ahead and chooses the path.

It having been determined that the changing over from the old to the new services would be gradual and that all the city and suburban offices were to be affected at the same time, the first problem Traffic had to settle, other than the purely engineering ones, such as switchboard requirements, etc., was how to permit of the operators distinguishing between old and new services at the switchboard.

This was easily cared for by having in part a different set of "service symbols"; in other words, lamp cap markings for the new service and by segregating the new services from the old in the answering jack space. This was done by clearing out certain panels among the old classes of service and filling in the new service most resembling the old, the stile strips being appropriately marked to assist the operators.

This is in effect the same as having two separate offices within the same building, with two teams of operators, interchangeable, of course, but with the handicap of the force having to be familiar with sixteen services instead of nine.

The analogy of the two offices may be carried even farther, as two sets of peg counts have to be made; two "lines and stations" reports compiled, the new measured service records kept severely apart from the old; special assortments made of tickets, two sets of toll rates used, etc., all of which add to the complexity and intricacy of the administration of each exchange.

Great Amount of Detailed Work Necessary

The amount of petty detail involved may be illustrated, perhaps, if I show briefly what has to be done with the suburban toll tickets. All tickets have to be assorted first by terminating exchanges for purpose of daily records we maintain and then these toll tickets made against both old and new service are placed together, rated and sent to the accountants as follows:

- a* Tickets covering calls of five-cent rate against flat rate stations and against old measured service stations.
- b* Tickets covering calls of five-cent rate against pay stations.
- c* All tickets of over five-cent rate, irrespective of class of service.
- d* Collect tickets.
- e* Credit messenger tickets.

The tickets included in the packages specified above are sorted as follows:

- Packages *a* and *b* numerically by originating number.
- Package *c* alphabetically by terminating points.
- Packages *d* and *e* no definite assortment.

Coincident with the giving of service to the signers of the new party line contracts was the introduction of divided ringing, a new feature in the Boston division. This necessitated a careful testing out of all the keys on all the boards in every office by Plant men, a work which was accomplished in record time with no interference whatever to the service or operators.

After this quite a little instruction for the operating force was necessary for the new method and the operators also had to be prepared on the use of "ring letter," L. M. R. and J.

To assist the operators in knowing what key to use in ringing stations on each side of the line, we associ-

ated with each key a small holder containing the necessary guide.

Why Letters are Used for Ring Designations

It may be interesting to some to know why we are using ring designations consisting of letters instead of numerals, and why we selected the particular letters that we did. The answer is that many numerals sound alike. We have frequent trouble with five and nine, for instance. The letters we have chosen do not sound like each other and are phonetically dissimilar to any numeral. Some companies use the letter "W," but that would be confounded with our word "double," which is employed in repeating numbers. Some letters are manifestly unfit, "x" for example, sounding like six; "b" like three, etc.

An additional advantage in the use of ring letters is that the word "ring" may be omitted, thus saving a little time.

We have usually reserved in Boston the multiples below 1000 for special lines, for if they were used for party lines and the person calling omitted the word "ring," a wrong number would be given, 219-3 becoming 2193, etc. This reservation is no longer necessary.

Not only did our Boston and suburban operators require to be made familiar with our ring letters, but also the toll operators in several of the distant toll centers like Brockton, Haverhill, Worcester, Providence, etc., the toll operating method used between these points and Boston requiring that their operators ring stations in Boston direct.

We have placed a special marking on the line multiple to designate divided ringing lines so as to catch "numerical calls", and this marking also allows of our assigning lines for new service immediately after clearing out the old services — a very important item, for in some offices we are short of multiple.

An interesting point came up in connection with the handling of a "reverting" call under the new system. On a straight ringing line the person calling hears the bell of the station desired rung if it is on his own line, and he hangs up until it does ring so as not to get the ring in his ear. On a divided ringing line, if the call reverts to the other side of the line, the person calling does not hear the bell ring and if he waits until it does he is apt to wait a good long time. The subscribers are gradually getting accustomed to the proper course to pursue, that of hanging up for a few seconds only.

One of the most important of our problems is that of the ticketing of the measured and the suburban toll calls.

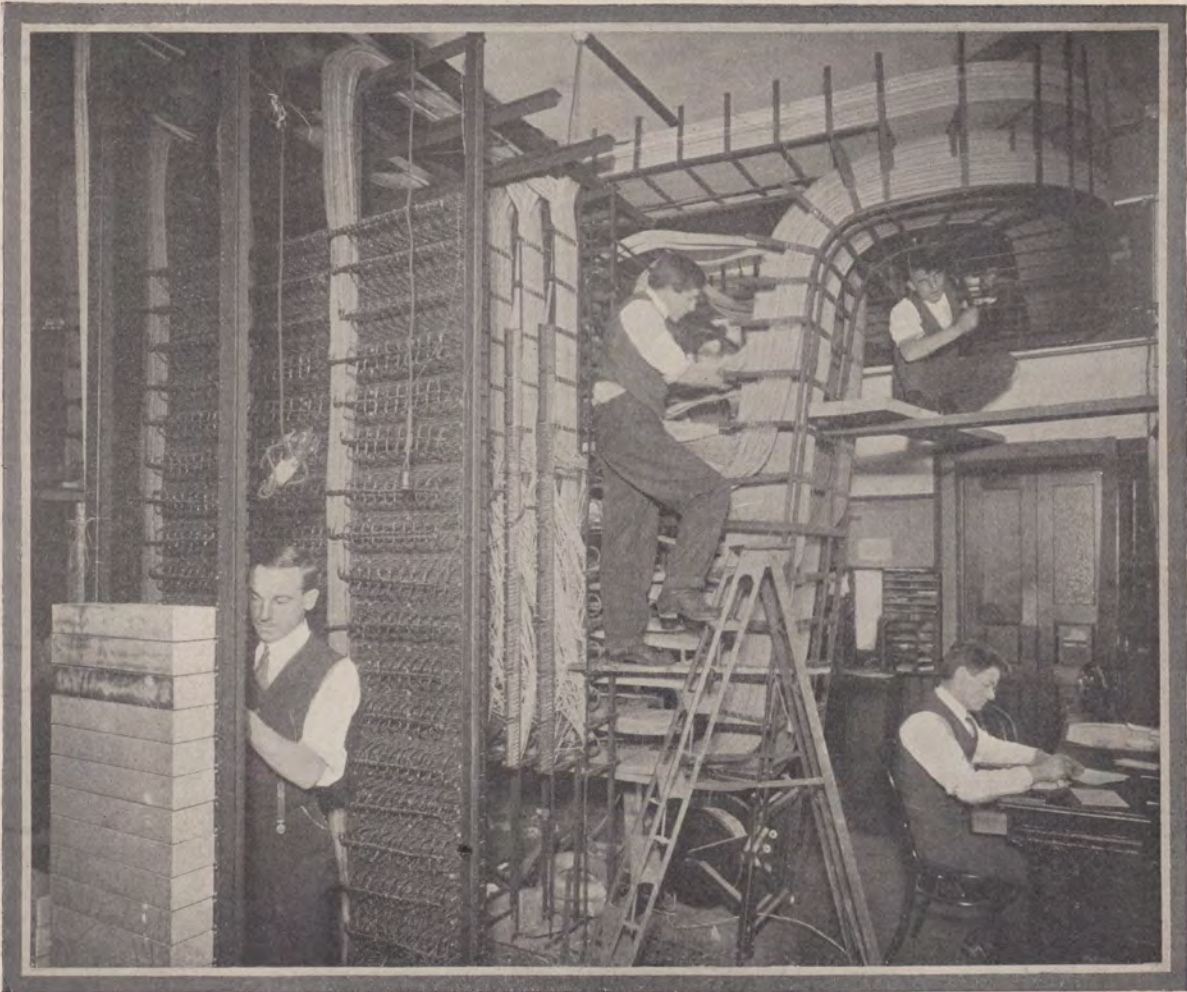
This feature is important for these reasons:

First, it affects our operating loads and thereby the cost of operation and the amount of switchboard required.

Second, it affects the company's revenue, inaccuracy or a failure to ticket involving a large monetary loss.

Third, it affects the subscriber — wrong charges, etc., causing dissatisfaction.

At present we have two methods for recording measured service calls; one the registering by meters and the second the entering of the necessary detail by hand on a form designed to accommodate forty calls which are afterward recapitulated on a second form by our clerks. All of the suburban toll calls (calls beyond the district), except two-number calls in the Boston and suburban districts from coin box stations on which no tickets are made, are recorded on regular two-number tickets; the calling and called for num-



ADDING TO THE EQUIPMENT IN THE DORCHESTER TERMINAL ROOM

In Every Central Office Affected by the Revised Rates a Great Deal of Work Has Been Done in Providing the Necessary Facilities for Carrying Out the New Schedule and for Future Increase of Business

bers, the time of connection, disconnection, operator's number, date, etc., being entered. The calls from the new services having the initial rate of five cents are recapitulated on the same sheets as the measured service, on account of the guarantee feature, but all other tickets are sent to the accounting office to be billed.

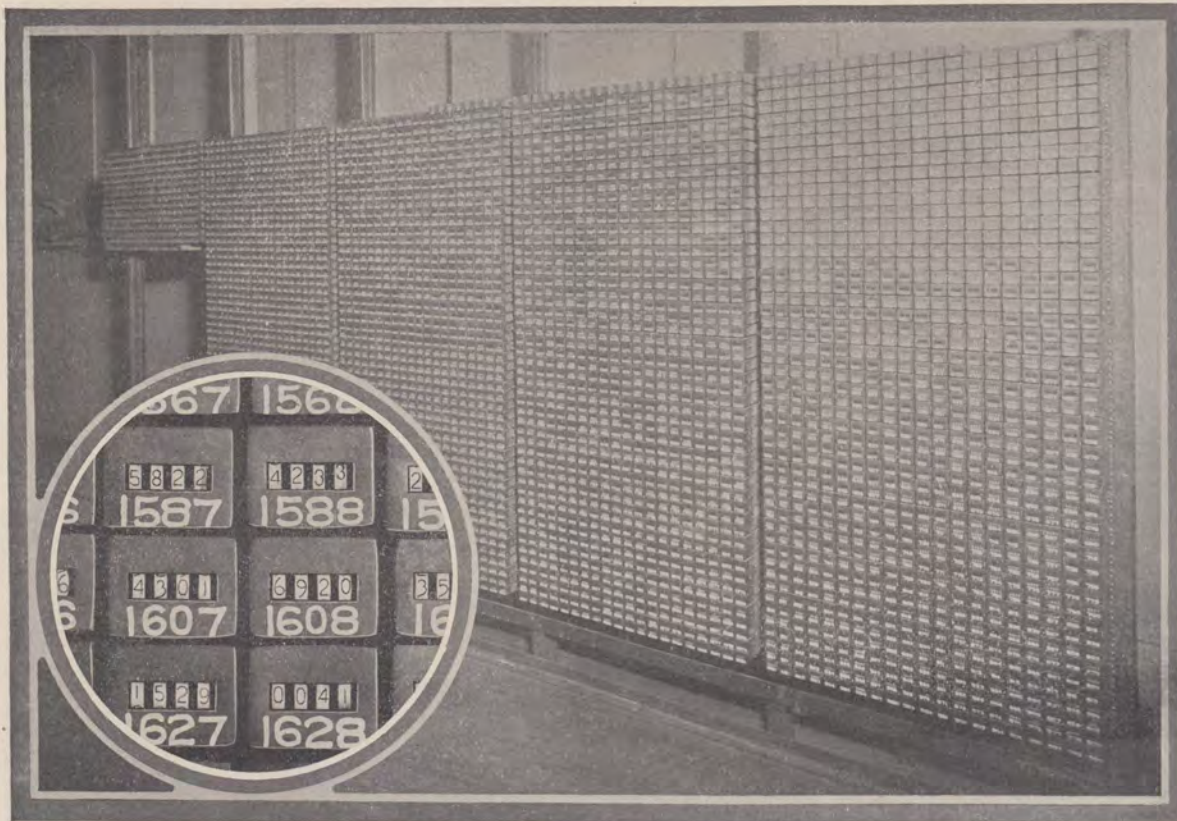
We now have meters at Main and Fort Hill and they will soon be placed in all of the other Metropolitan exchanges, the Plant department force having the matter in hand and expediting the installation. These meters are only applicable to special and P. B. X. lines, but on such lines the result is to reduce the operator labor to the basis of flat-rate traffic.

The decrease in operator labor accruing from the use of meters was not adequate in the Main exchange to offset the additional labor of making tickets on the suburban toll calls, and to lighten the load sufficiently to permit of the maintenance of the same grade of service, we are finding it necessary to transfer at least

1000 lines to the Fort Hill exchange, the latter drawing from the same territory as Main. The above is one concrete example of the additional switchboard positions made necessary by the new system.

In order to facilitate the recording of the traffic that must be ticketed in offices other than the metropolitan, our department is now working on a small ticket form on which may be printed the name of every Boston and suburban exchange and the rate to that exchange from the exchange at which it is being used. There seems no question but that this form will be much more convenient and less expensive for two-number work, but whether it can also be used for recording measured service is open to question and is now under consideration. It is very desirable to have one form for both classes of calls, other things being equal.

Our operators are thoroughly impressed with the importance of making a record of every call that should be ticketed and of making that record with absolute correctness. This feature has been repeatedly



METERS FOR AUTOMATICALLY REGISTERING MEASURED SERVICE CALLS

This picture represents the meters now used in the Main and Fort Hill Exchanges and which are to be provided in many other exchanges for the registering of measured service calls originating from special line stations.

These meters resemble very much the familiar cash register in electric cars and the operation is the same, but instead of pulling a cord to register, the operator after the completion of these calls, presses a key associated with the pair of cords on which the connection has occurred, which, in turn, operates a relay, causing it to pull up and register the call exactly in the same way as ringing in a fare.

The meters are about an inch square and are mounted on a rack each having two numbers; one to designate the line number, and the other the meter number. All readings will be taken once a month and by subtracting the previous reading, the number of calls made by the subscriber will be ascertained.

taken up in our operating conferences and daily service tests to detect weaknesses of this nature are a part of the inspection routine.

To assist operators in remembering that a toll charge must be made on calls beyond the district from stations entitled to district service, particularly on calls handled over direct trunks, the designation strips of trunks to exchanges outside of the district of any exchange have been given a distinctive color. In the case of switched calls an operator reverts to the first route to determine whether the exchange is outside of the district or not.

The feature that is causing us as much concern as any other in this cut-over is that of the handling of the number changes, practically every party line number having to be changed when the service is changed. Our regular procedure on a call for a number thus affected is to connect the party calling with the information desk operator, who supplies the new number to the subscriber, and also goes in on the "B" operator's

head telephone on a special shunt and gives her the order — a very clean operation.

This reference to the desk, although the only thing feasible in a large unit, is an unfortunate feature of telephone operating.

It is looked upon by the person calling as a nuisance; it takes some of the telephone user's time; it is unprofitable labor for the telephone company, requiring special operators; it extends the holding time of a trunk on a call from a distant exchange, thereby lowering its efficiency; the "A" or "B" operators have to handle the order twice, once from the party calling and once from the information operator.

Obviously, there is a limit to the number of calls that can be satisfactorily handled this way. The solution is to issue directories containing the new numbers frequently enough to keep the changes within the bounds of proper handling, and a partial solution is provided if subscribers can be persuaded to give their new numbers to the telephone users who are liable to

was not entirely satisfactory. We have now provided for the centralizing at each district headquarters, both day and night, of all calls from subscribers within that district for the "Manager." These calls come over special trunks and terminate on a special desk covered all day by an experienced man, known as an assistant traffic chief, and the lines are also multiplied into the chief operator's desk to be answered when the assistant Traffic chief is momentarily absent or excessively busy. Another Traffic man specially trained to meet the public is assigned, among other duties, to interview subscribers who may be dissatisfied with the quality of their service and to adjust criticisms. Special arrangements have also been made to improve the evening and night service by detailing an assistant Traffic chief to have supervisory duties after five in the evening.

In the successful introduction of the new services and the maintenance of a standard quality of service by the Traffic department, the assistance of the other departments is needed by Traffic. It was pointed out, in the early part of this paper that this assistance had never been withheld. Although Plant and Commercial have had problems fully as important as ours, yet "service" has been considered first.

Herewith are specified a number of ways in which this assistance is rendered:

Plant men help by being quiet and considerate in the operating room; by leaving no tools or material in places used by operators; by making desired cross-wiring changes promptly so that old and new services are not mixed in panels, and so that traffic may be properly and evenly distributed on positions; by preventing line reversals through care in installation and testing out; by making the fewest possible number changes on the obsolete service; by keeping trouble on the working positions at a minimum, and removing all that occurs with such dispatch that no inconvenience is caused to operators by such switchboard trouble.

Effect of New Rates on Switchboards

Traffic relies with confidence on the equipment force of this company and the Western Electric Company to complete switchboard changes and additions in time for our needs. It is recognized that the equipment work is affected by such important items as the time allotted, the time required and consumed for specifying, the availability of material, etc., and that if some dates are not met, there are good reasons for such a thing. The effect of the new services on the switchboard required, while forecasted as accurately as possible, could not be determined with such accuracy that one could say with entire certainty that every date set was the absolutely correct date. Some dates may be too far off, others set sooner than necessary. With this condition the original schedule has to be departed from in many cases, but all may be assured that there is a system about such changes. The routine is well in hand, the reasons for any deferred completions known and understood, and no actual necessity will be allowed to go without correction.

Commercial helps Traffic by ceasing canvassing in any place where the service is detrimentally affected by a large number of changes, additions, etc.; by properly explaining the new system of divided ringing to subscribers so that too much is not expected; by writing line orders to that their meaning is clear and unmistakable; by checking up the directory and addenda with such care that errors are detected, duplicate numbers prevented, etc.; by picking up all obsolete directories, thus reducing the liability of par-

ties calling for old numbers and getting wrong parties; by issuing on time accurate directories on a schedule mutually agreed upon.

How Various Departments Co-operate

For the successful introduction of the new services, for the notifying of the subscribers and for the facilitating of the operating there is no item more important than a sufficient number of directory issues, issued on time and with listings accurately compiled and printed. The special fall issue aided Traffic to the extent of approximately 15,000 new listings. It is worthy of note that this directory was being delivered to subscribers just twenty days after the lists were closed.

The way in which Traffic can help undoubtedly occurs to every one. Commercial will probably say, "by giving a grade of service that satisfies the public and by *taking the changes and additions as fast as they come.*" Plant would probably specify, "the keeping of answering jack changes at a minimum and *taking changes and additions as fast as we give them to you.*" The auditor would say, "more accurate and legible ticket work and *get it in quicker.*" What we probably need as much as anything is to be more in sympathy with the other fellow's trouble. We have some troubles, but we have not got them all.

We will all agree that in the final analysis a large share of the burden of this cut-over falls on the operating force — chief operators, supervisors, operators and clerks. The service having been sold, it is up to them to stand and deliver. I am confident that our young women in the ranks are equal to the task. They are individually interested and enthusiastic. One will find a no more efficient, devoted, ready-for-emergency corps of women than our operating force. They are doing their complete share to make the new services the success they fully deserve.

There is reason to feel that the establishment of the new services will result in conditions permitting of Traffic giving service of a more satisfying quality than has been possible heretofore. There are distinct advantages to the operating force as well as to the subscribers, among which may be mentioned: The reduction of the number of parties on a line, which will result in less party line interference, less complaints of excessive use of lines by other parties, and a reduction in "busy line" conditions; the use of divided ringing which will cut down the number of rings, thereby lessening the confusion to subscribers and decreasing the operator labor; the use of the new semi-selective machine ringing, which will result in less manual effort, more accurate ringing, and a high "B" operating efficiency; greater uniformity in key equipment; a reduction of what has been termed "frivolous calls," more discretion being used by measured service subscribers in calling; less measured service ticket work through the use of meters for registering calls. These are but a few of the more concrete benefits we can conceive to Traffic. Others will, no doubt, suggest themselves. A faster and cleaner operation is certain.

Information Settled Lawyer's Argument

The subscribers of the Lewiston exchange have unbounded faith in the information operator. She is plied with all manner of unusual questions and asked to settle disputes. A short time ago two lawyers had an argument and left it for the information operator to settle, neither being sure, but perfectly confident that "Information" must know, they were willing to abide by her decision.



THE "STEERING" COMMITTEE, WHICH SOLVED MANY OF THE NEW RATE PROBLEMS

Left to right—A. D. King, traffic engineer's force, representing the Traffic department; L. P. Lanthier, division contract agent, representing the Commercial department; G. J. Rauh, district field engineer, representing the Plant department.

"THE STEERING COMMITTEE"

THE above photograph shows the "Steering Committee" during one of its many conferences to discuss the problems to be solved in connection with applying the new rate schedule.

As brought out by Traffic Superintendent Whitcher in his paper on "The Application of the New Services," read before the Telephone Society on November 9, and which is printed in full in this issue of "TOPICS," it was apparent that in the working up of the general plan for the tremendous work of changing over all the subscribers in the Boston Metropolitan and Suburban exchanges, from the old to the new basis of rates, that the closest co-operation must exist between the three operating departments, if complete success was to be expected.

To this end a working or steering committee was formed, composed of one representative from each of the three departments, on whose shoulders would rest the responsibility of the actual working out of the many detail problems that would be met with in the progress of change. The men selected to form the committee to meet this task were Messrs. L. P. Lanthier, Commercial, A. D. King, Traffic, and G. J. Rauh, Plant. Each of these men had become thoroughly familiar with the requirements, plans and conditions of their respective departments through their close association during the months of preliminary preparation for this work, so that they could plunge immediately into the problem as a whole.

Daily conferences were first held to lay out jointly, according to the needs of each department, the proper course of the work, which would avoid the weak places from either the Plant or Traffic viewpoints and at the same time to formulate plans to reinforce those weak places before they could give way. The meetings were held frequently and only when some special problem presents itself, as the general plans previously laid out are being followed. The representatives, however, are in daily touch with one another and the progress of the work is closely watched.

One of the functions of the Commercial department in connection with this change is the meeting of the public and the writing of the contracts for the new service. After the necessary orders are issued, it is then up to the Plant to complete the work to allow the Traffic to give the desired service. The Commercial department is, therefore, more or less dependent upon both the Plant and Traffic conditions in an exchange district before they can canvas for changes to any great extent. The Plant and Traffic must, therefore, in order to allow the Commercial to use their full strength, keep that department advised of the exchange districts where they can safely work, and at the same time the Plant and Traffic must lay their plans in such a way that other points will soon be available.

The closest co-operation and understanding of purpose must, therefore, exist between the Plant and Traffic functions to the end that their strength can be placed and concentrated at the weakest points. The representatives of these two departments are, therefore, in constant understanding with each other, and it was found to further their interests that a joint office should be opened, which was done on the ninth floor of the Boston Safe Deposit building. It is therefore possible for each department to thoroughly understand the conditions of the other and to keep in very close touch with each other.

The work is progressing very rapidly and satisfactorily, and there is no reason why the final completion of this great task, equal to any ever put up to a telephone company, will not be reached with great credit to the New England Telephone and Telegraph Company.

Asked for Rebate of Four Cents

A subscriber asked information to find out how much it would cost to call a certain party. On being told that it was five cents for five minutes, he called the party and talked one minute; after finishing his conversation he signalled the operator back and said, "Give me four cents back; I only talked one minute."

HARD DRAWN COPPER WIRE

And How It Came About

BY THOMAS B. DOOLITTLE, Sc.D.



EDITORIAL NOTE.—One of the most important of the early discoveries in connection with telephony was the advantage of hard-drawn copper wire as a conductor. The inventor or discoverer, or adapter, was the writer of this article. The importance of the application of this principle, Mr. Doolittle, probably because of excessive modesty, has touched upon very lightly. It is well recognized by every telephone man, however, and, because of this fact, TELEPHONE TOPICS asked for the story of how it came about, so that the authentic narrative might be perpetuated. We present it, therefore, as an interesting historical chapter, and especially interesting because the writer is known the length and breadth of the land wherever telephone men foregather. Nor are we putting it too strongly if we add that he is loved wherever he is known.

THE experiences of life are a determining factor in the results that follow. At the age of 18 I abandoned a position in New York city for the reason that I saw no satisfactory future. And by the advice of an old gentleman who said to me—"Learn and become expert in a good trade; that is always an asset that cannot be taken away from you; then if you wish to enter new fields you will have something to fall back upon in case of disappointment"—I took a position with my brother, a very skillful mechanical engineer in the brass mill and wire works of Wallace & Sons, Ansonia, Conn. After this experience I passed as a good workman and received pay accordingly.

Passing over years of interesting events, I entered the manufacturing business as president of the company. This continued for seven years, and during this time (in the early seventies) I became interested in electrical matters to some extent, and joined in the organization of the Bridgeport Social Telegraph Company. This was made up of manufacturers, bankers, etc., and several residents. This gave me an insight into the requirements of the telegraph business, and at the advent of the telephone I was in a position to appreciate its value. Our system was conducted in the manner of a telephone exchange, with a switchboard operator and radiating lines.

Telegraph System Converted Into Exchange

In June, 1877, the telephone was brought to my attention and our telegraph system was immediately converted into a telephone exchange, and permanently, as fast as telephones could be secured and apparatus could be devised and constructed.

That the adaptation of a well-known principle to meet conditions sometimes leads to important results is well illustrated by the story (which, by the way, I used once before in the Harvard *Engineering Journal*) of the raising of the obelisk in the Piazza di San Pietro, Rome. The populace were commanded under penalty of death to keep silent. At a critical moment, when the obelisk had nearly reached a perpendicular position, the ropes proved too long. A sailor cried out, "Acqua alle funi" (wet the ropes). This was done, and the shrinking of the ropes set the obelisk squarely on

its base. It will be remembered that the sailor (Bresca) received a reward instead of the penalty.

The sailor was familiar with ropes. My experience had made me familiar with manufacture of copper wire. I knew from experience that the process of drawing resulted in the hardening of the surface which, in turn, increased the tensile strength. Therefore, hard drawn copper wire was an adaptation rather than an invention. It was a discovery only so far as my peculiar method of drawing increased its tensile strength to a point where it was made available for aerial electric conductors on pole lines. Possessing the knowledge referred to above, and anticipating the coming demand for line wire, I reasoned that, if copper could be made available, it would be in the first instance less expensive per mile ohm than iron and, besides, would last indefinitely when exposed to the elements.

First Experiments to Solve Problem

In the fall of 1877, while acting as an agent for the Bell Telephone Company, I received an order from the Ansonia Brass and Copper Company to connect their office and mills by telephone. Samuel Cotter was the general superintendent of the mills. To him I addressed myself, stating that I wished to build those lines of copper wire and to have the wire drawn under my own direction. I well remember his reply: "You can build them of gold if you want to." Thereupon he accompanied me to the wire mill, where he instructed the superintendent to detail a man to do whatever I required.

The problem (if it could be solved at all) was to draw a rod of a given size (or number) down to a wire of given size (or number) without annealing, and in this way to produce a wire with the proper tensile strength and ductility. A rod of Lake Superior copper was procured and the experiment began. After repeated trials with rods of different sizes and by the use of many "holes" or dies, in order not to crystallize or granulate the metal by too much strain, the desired result was accomplished, but not until after many trials in which we found the finished product either too brittle or too soft.

It is an interesting fact that drawing the wire eleven numbers produced the result then, and today the hard drawn copper for line purposes is referred to by the manufacturer as "eleven numbers hard." Although the product is known to the trade as hard drawn copper wire, and properly so known, as the name indicates its property of hardness and the method of manufacture, the name has no contra term, because soft drawn copper would be a misnomer. The very process of drawing eliminates the quality of softness and makes it hard.

Previous to the introduction of hard drawn copper wire much thought and large sums of money had been expended to get the benefit of the superior conductivity of copper for electric line conductors. The first recorded employment of copper wire as a line conductor was its use by Professor Morse in his experimental line between Baltimore and Washington. The ordinary market wire was used, but for the reason that it would not sustain its own weight it was abandoned and iron wire was substituted.

The next on record was strung by the Western Union Telegraph Co. in New Jersey. In this case also the ordinary copper wire was used. This proved unsatisfactory and was taken down. An attempt was made to increase the tensile strength by doubling and

twisting it. This was done and the wire was put up again. It was still unsatisfactory and was again taken down. This information I had from one who was employed upon the work.

In another experiment steel wire was used with a copper ribbon wound spirally about it. In another case the copper ribbon was folded longitudinally about the steel wire. In another the copper was electroplated on the steel wire. This latter was adopted by the American Rapid Telegraph Company on all of their lines and was manufactured by Wallace & Sons in Ansonia, Conn.

This went the way of all the others for the reason that a chemical action was set up between the steel and copper which destroyed the steel. There were many other and equally futile attempts along the same line. It is to be admitted that the advent of the telephone created a great demand for electric conductors of high conductivity, but it is unaccountable, when we consider the amount of money that had previously been expended and the amount of work that engineers and inventors had given to the subject, that it had occurred to no one to avail themselves of the simplest possible thing—hard drawn copper wire, unless, metaphorically speaking, there was no sailor present to suggest "wetting the rope."

The work of connecting the several mills, offices, and residences of the officials of the brass company was carried on to completion, all lines being of hard drawn copper. A switchboard was placed in the office of the brass mill and placed in charge of Charles A. Cotter, son of the general superintendent. This was, undoubtedly, the first private branch exchange in the world.

One of the Early Circuits in Service 17 Years

One circuit was connected to the freight house of the Derby & New Haven R. R., which could be and was, occasionally connected through to New Haven. This exchange was discontinued on the complaint of the Connecticut Telephone Company on the ground that it was a telephone exchange and that they, the Connecticut Company, held exclusive rights for exchange purposes in the territory. A portion of the wires in the Bridgeport exchange were of hard drawn copper and these continued in service for 17 years, or until they were displaced by underground cable.

The wire showed no deterioration. I had the greatest difficulty in trying to introduce this wire. I urged it upon several companies, including the Western Union Telegraph Company. At last I secured the promise of a company to make tests of it, provided the wire could be furnished at the cost of iron. I made the proposition to the Ansonia company without success. One day I met Col. Fred Mason, president of the Bridgeport Brass Co., who said to me:

"Doolittle, there should be something in the telephone field that would interest us."

"There is," I replied, "but you wire people have no sand."

"What do you mean?" said he.

"You will not do what I ask," I replied.

"Now wait; I will do anything you ask," he said. "Now go ahead."

I explained that I wished him to furnish a given amount of hard drawn copper wire at the price of iron, pound for pound.

"I will do it," he said. "Send in your order."

I immediately went to the manager of the telephone company and made arrangements for him to send in

his order. I went on a long business trip and when I returned was informed that the wire had been strung. I went to the place to see it and make a test and found, much to my surprise and disgust, that they had strung common market wire, cotton covered. They said in explanation that, it being an experiment, they had ordered cotton covered wire so that, if it proved a failure, it could be taken down and used for inside wiring. Of course it proved a failure. The first rain soaked the cotton and the whole line sagged to the ground.

Management Had But Little Faith

In another case, I had almost persuaded the management of a company to string a metallic circuit of copper wire between two important cities, but at last they weakened and, instead of that, they strung a number four iron with a ground circuit. The unusual size and conductivity of this wire only served to increase the induction to a point where it was almost impossible to talk over it. The fact that the hard drawn copper wire had been in successful use for about five years appeared to have no weight.

The objections to hard drawn copper, without any investigation whatsoever, were of many kinds. That it was too costly; that it would stretch and sag; that it would not stand exposure to the elements; that the structure of the metal was impaired by the process of drawing; that the conductivity was reduced to a point where it would be little, if any, better than iron; that it would be stolen, etc. The most amusing objection was that it would expand from heat of the sun, and not contract to normal when cool. Some one said that if this was the case, it was foolish to draw the wire, for it would only be necessary to lay a rod of copper wire out into the sun. Then with a few hot days and cool nights it would draw itself.

Mr. William Wallace went to the trouble to refute the latter objection by suspending 200 feet. He then placed a graduated scale midway between the two supports and turned on an electric current. This heated the wire and the expansion caused it to drop down the scale. The wire was then allowed to cool, when it gradually returned exactly to its original position on the scale.

Finally, the subject was brought to the attention of Mr. Theodore N. Vail, then general manager of the American Bell Telephone Company. He, with his usual comprehensive grasp of things, authorized me to build a metallic circuit of hard drawn copper wire between New York and Boston. When Mr. Vail inquired of me relating to the manufacture of the wire, I related to him the experience of Col. Fred Mason of the Bridgeport Brass Co., and explained to him that his company was loser some hundreds of dollars, and that it would be only fair to give them the contract.

Mr. Vail asked me to send for Colonel Mason, which I did, and a contract was made with him and proviso that the wire should be drawn under my personal supervision. The wires were strung on the poles of intervening companies between New York and Boston as far as their lines extended, the gaps being filled with new lines. A contract was made with the S. N. E. T. Company to string the wires and build the necessary lines. The work was placed in the direct charge of Mr. J. K. Butler.

In December, 1877, I sent samples of the first hard drawn copper that was made to Boston for tests. After a year of exposure I sent another sample. In February, 1881, at the request of Mr. Thomas A.

Watson, engineer of the Bell Telephone Company, I made a report on the condition of the wire and forwarded samples of both the old and new wire. My report was referred to Mr. Vail, who instructed Dr. W. W. Jaques, electrician, to make a test of the wire for conductivity, as compared with soft copper wire, and also as compared with iron wire, and as well with the new hard drawn copper wire that had not been in service. There was shown to be no perceptible deterioration in any way.

Last Test Proved a Great Success

On this last test and report I built great expectations, and rightly, for the product had proved in beyond any reasonable doubt. These expectations were for the general interest of the telephone business, and the public, and not on account of any monetary reward by reason of a proprietary claim, as will be seen.

Soon after the wire had been in public use, I consulted my attorney, William Cranch McIntire, of Washington, D. C., regarding the possibility of covering the product with a patent. After hearing my story, he advised me that a patent could be secured as a "new article of manufacture." He then drew the specifications and waited for my order to apply for patent.

At the expiration of two years, after the wire had been in public use, the time had expired within which, under the law, a patent could be issued. I had made no progress in extending the use of hard drawn copper wire beyond the system of the Ansonia Brass and Copper Company and my own telephone exchange in Bridgeport, Conn. I was not in a financial position to take any financial chances whatsoever, and so the subject of a patent was dropped. The production of the wire having waited for the man with knowledge of the subject and its application, so its development awaited a man with financial backing, ability and broad comprehension of its possibilities.

Accordingly, in 1883, six years after hard drawn copper wire had been in constant and absolutely successful service, General Manager Theodore N. Vail commissioned me to build a metallic circuit of number twelve Birmingham gauged hard drawn copper wire between Boston and New York. The cost of this experiment was estimated at about \$70,000. It must be remembered that in those days and within the telephone interests, \$70,000 was a very large sum of money, and in my opinion no man in or outside of the telephone business other than Mr. Vail would have had the courage to undertake the enterprise. I heard it referred to derisively as "Vail's baby."

On account of the indifferent success with iron grounded circuits there was a general apathy throughout the country regarding toll lines. Many difficulties were encountered in building the lines and stringing the wires. Not the least of these was the inclement season. Mr. Butler stated to me that his men had not a dry thread upon their backs for two months. Notwithstanding this, the work was pushed vigorously in rain or sunshine.

At this time all the wires were overhead, consequently our copper circuit had to be strung through the network of every intervening city on poles and over housetops. When at last the lines were completed and ready for test, the industrious stringing of exchange wires in the intervening cities kept us in trouble almost constantly. Five minutes with an absolutely clear line was a rarity during the day. Most of the testing and calculations were made at night. The

blasting of rock in Westchester county frequently tore down our lines.

I shall not forget one scene when all of the directors of the Bell Telephone Company filed into my little room at the corner of Greenwich and Liberty streets, with solemn tread, for the purpose of testing the new copper circuit. I had arranged for men to patrol the whole distance between New York and Boston for this occasion. Everything had been working perfectly; conversation was carried on between the two cities as though it were only a block distant.

I was in a state of nervous tension, as I understood this to be the deciding hour. I called for the laboratory in Boston and got no response; we waited—called again and again. My assistant, Mr. E. H. Lyon, made a galvanometer test of the circuit which indicated a clear line. There was no induction. After a half hour the directors filed out.

I called the test station on the north side of the Harlem river and received no response. I then sent a man to Harlem who, in the course of two hours, reported to me that a tug boat, towing a lumber barge, had caught our cable and taken out about 250 feet, and that both of our wires were grounded in the bottom of the river.

A few days served to repair the damage, a test was made by the directors from the Boston end of the line, and the result was then approved. During the time that the test and experiments were being conducted, I was visited by Messrs. Preece, of England, Wabner, of Germany, and Berton, of France, each at the head of the telegraph and telephone department of their respective countries. Each climbed the three long flights of stairs leading to my little den, after which each returned home and immediately instituted the manufacture and use of hard drawn copper wire. The Postal Telegraph Company was the first of the telegraph companies to adopt it in this country, their whole system being built of it.

Resumed Work of Development

On Aug. 15, 1885, the American Telephone and Telegraph Co. was organized with Mr. Theodore N. Vail as president, myself as vice-president, and Edward J. Hall as secretary and general manager. Mr. Hall, who had an extraordinary fitness for the position, was made the executive head. My position was tentative, and I soon resigned and resumed my work on the broad lines of development throughout the country.

The development of the A. T. & T. system was rapid, hard drawn copper wire was generally adopted for toll lines and very largely for exchange lines throughout the world, and its use is constantly increasing. As far back as 1896 the output for the year in this country alone was upwards of eighty million pounds.

With regard to the manufacture of hard drawn copper wire in recent years, great improvements have been made in the process of manufacture, which cover all operations from the ingot to the finished product. When my experiments were made, it was the practice to roll a billet of copper, say of six or eight inches in width, into a long sheet and then, after being annealed, it was taken to a slitting machine and slit into square rods.

These rods were tapered by means of a hammer, in order that they might be inserted far enough through the drawing die to be grappled on the opposite side, after which they were ready to be drawn into wire. This method of starting with a square rod had dis-

advantage, for the reason that the corners were likely to lap and fold over in the process of drawing, thereby producing flaws or bad places in the wire, these flaws becoming more and more troublesome in the smaller sizes of wire. After having been drawn through a certain number of "holes," the surface requires that it should be annealed before any further reduction in size is practicable. The new process is substantially as follows:

Description of New Process

The copper is received from the smelting works in the form of wire bars, which are approximately 54 inches long, with an average diameter of about three and three-fourths inches, and weigh about 200 lbs. each. These are delivered as commercial copper wire bars.

The first operation is to put the bars into what is termed a "continuous furnace," bars going in at one end of the furnace and taken out at the other. In their passage through they are heated to about 950 degrees centigrade, at the rate of about two bars per minute.

The heated bars are then put through a series of grooved rolls. Each succeeding groove being smaller, the result is a reduction of the three and three-fourths inch bar to a diameter of five-sixteenths inches. These are now called rods, and are taken up on a reel in the form of a coil about 30 inches in diameter. These coils are then taken from the hot-rolling department and are cold at that time. They are then plunged into a bath of sulphuric acid and water for the purpose of removing whatever oxide has been formed in the hot-rolling operation. After about 20 minutes in this solution, the oxide is removed and the rods are then taken and thoroughly washed with clean water under a high pressure from a hose; after which they are immersed in a vat containing a lubricant of tallow and soap. The rods are now ready for the drawing process.

The rods are substantially drawn on what is termed by wire manufacturers a "continuous wire drawing machine." That is to say, the five-sixteenths inch rod goes in at one end of the machine, and, after passing through several dies, each one reducing the diameter and hardening the wire, it finally is drawn around a block to the finished size, say .104".

In making this reduction, the copper is reduced in diameter from number one wire gauge to number twelve wire gauge or, in technical terms, the wire is "eleven numbers hard." This process gives the wire the greatest amount of tensile strength possible from commercial copper and yet preserves its elasticity. The cost of production is enormously reduced by the new process. Whereas, under the old process, a very skilled workman was required for each single drawing, an attendant is now able to care for several continuous drawing machines that are run at a speed unapproachable by the old method. In the smaller sizes of wire, diamond dies are employed which, in themselves, represent a very considerable investment.

Commercial copper in its soft state has a tensile strength of about 28,000 pounds per square inch, with an elongation of about 36 per cent, and by the cold drawing process above described the tensile strength is increased by each number drawn, and the elongation is reduced; therefore when the copper wire is drawn eleven numbers hard it has a tensile strength of about 64,600 pounds per square inch, with an elongation of about one per cent. The wire is then taken from the wire drawing blocks, so called, and is care-

fully inspected for tensile strength, elongation, torsion and conductivity. The inspected wire is then carefully packed by wrapping each coil with burlaps, so that it does not become bruised or damaged in any way by transportation.

The cost of hard drawn copper wire fluctuates with the price of ingot copper and at present writing is quoted as sixteen cents per pound. The relative cost of copper and iron wire, say of number twelve, is three and three-fourths cents for iron and sixteen cents for copper.

The advantage of copper over iron, besides what is shown in the table below, is that it is practically indestructible, except from mechanical injury, and if it receives mechanical injury it can be made over into new wire at a cost of about two cents per pound, while iron, which is subject to rapid deterioration from rust, is worthless when taken down.

The output of hard drawn copper wire has steadily increased from year to year.

The comparative properties of number 12 N. B. S. gauge copper and iron wire are given in the following tables, this being the size in the largest general use as telephone toll line conductors.

The following tables have been revised by Dr. Jewett through the courtesy of J. J. Carty, chief engineer.

	Electro Static Capacity No. 12 N. B. S.	Diameter in Mills	Resistance per Wire Mile 68 degrees F. Ohms	Inductance per Pair Mile Milhenries	Effective Resistance per Wire Mile Ohms	Electrostatic Capacity per Pair Mile Micro Microfarads	Miles equal to 1 Mile Hard Drawn Copper for Telephone Transmission
Soft copper	104	5.1	3.66	5.1	8350	1.02	
Hard drawn copper	104	5.2	3.66	5.2	8350	1.00	
Iron B. B.	104	36.0	17.2	47.0	8350	0.26	

	No. 12 N. B. S.	Diameter in Mills	Weight per Wire Mile lbs.	Tensile Strength in pounds	Torsion in 6 inches	Elongation in 5 feet per cent
Soft copper	104	173	290	50-75	40	
Hard drawn copper	104	173	550	25-45	1	
Iron B. B.	104	153	450	45	18	

The above figures represent average commercial conditions. The ordinary commercial copper wire is assumed to have a conductivity of 99 per cent of that of pure soft copper, while that of the hard drawn is 97 per cent.

The wires of a pair are supposed to have a separation of 12 inches on centers. In calculating the inductance and effective resistances, a frequency speed (2πN) of 5,000 has been taken, while assuming a permeability of 100 for the iron wire.

Much of added interest could be written were the writer to disregard the individual trade secrets that must be respected.

NOTE.—On June 1, 1898, the Edward Longstreth Medal was awarded to Dr. Thomas B. Doolittle "for his hard drawn copper wire."—Ed.

DIRECTORY ADVERTISING

WE have had a good year for directory advertising — better than was anticipated. Next year's business is going to be still better, however, unless the early reports for 1911 are misleading. All over the territory there are indications of a live interest in this subject, not merely the abstract interest of a desire to contribute to the general result, but also a concrete interest that is practically shown in the contracts that are being turned in.

This is an important feature of the work of the Commercial department, and one which the general Commercial superintendent is following with close attention. Getting contracts of this kind is a test of good salesmanship. A man who can make a good record as an advertising salesman demonstrates qualities that make him as one who is bound to be a good contract salesman. It is our intention to present their records in detail so that those who desire this information may know "Who's Who."

Not having received the directory printing costs for the year, we cannot at this time show what relation the advertising bears to the total cost of publishing these directories. In perhaps one or two instances the advertising is sufficient to cover the cost of the books, but in the larger directories the advertising receipts cover only a small proportion of the cost.

Our job is to demonstrate the value of directory advertising in order to realize the growing appreciation of these mediums. The more we can do along these lines the more we will contribute to the reduction of one item of expense that grows with tremendous rapidity. Every new subscriber contributes not only to the size of each directory, but also to its circulation. Every new subscriber therefore adds in two directions to the cost. On the other hand these additional subscribers add immensely to the value of the directory as an advertising medium, and there is no need of sworn circulation statements to substantiate our assertions.

The following table shows the gross revenue, the cost of the advertising space, the cost of solicitation, the percentage of solicitation cost to the gross revenue, and the net return in each section.

Detailed Summary of Directory Advertising

Section	Total Revenue	Advertising Cost	Cost of Solicitation	Percentage of Cost of Solicitation	Net returns
1	\$35,383.78	\$7,227.37	\$5,010.45	14.1%	\$23,145.96
2	1,891.30	329.51	205.01	17.4%	1,356.78
3	1,633.61	262.75	214.10	13.1%	1,156.76
4	3,201.78	531.94	379.52	11.5%	2,290.32
5	4,100.12	749.33	447.51	10.9%	2,903.28
6	1,545.30	256.02	70.73	4.5%	1,218.55
7	4,331.78	879.51	336.12	7.7%	3,116.15
8	531.95	154.99	109.04	20.4%	267.92
9	780.40	185.69	34.89	4.4%	559.82
13	1,005.00	163.85	99.23	9.8%	741.92
17	1,873.80	398.19	102.71	5.4%	1,372.90
18	786.25	191.64	22.83	2.9%	571.78
20	1,754.15	297.46	105.25	6.0%	1,351.44

Cruelty Over Telephone

The Judge — Can you describe any specific act of cruelty on the part of your husband?

The Complainant — I should say I can. Whenever he had anything to say to me, he'd call me up on the telephone and say it, and then disconnect before I had a chance to talk back to him. — *Chicago News.*



YOUNG TELEPHONE "LINEMAN"

General Manager Black of the Aroostook Telephone Company believes in training his men at an early age. The above picture shows one of his embryo line men in the act of climbing a pole.

This young man is Buriil Huntress, aged nine. He is a very enthusiastic telephone "man" and, provided with a complete "kit," he likes nothing better than to help his father, who is also one of Mr. Black's men at Caribou.

Getting things *done* is a matter of getting things *started*.



Showing Long Stretch of
Wires Laid Flat



Putting up
Emergency
Cable

REPAIRING THE DAMAGE AFTER A SLEET STORM DOWN IN MAINE

EARLY in the morning of November 30, Maine was visited by its periodical sleet storm, some of the results of which may be seen in accompanying cuts. The apparent storm center was in the vicinity of Waterville and Benton, sweeping thence with lessened force over the entire Lewiston district and across into New Hampshire and in the opposite direction toward Bangor.

The worst break occurred on the flats between Benton and Benton Falls. For a distance of about two miles the 38 wire trunk line was twisted and torn to pieces. Twelve poles were down, about 100 ten-pin arms broken and the circuits so badly broken and tangled that it was impossible to obtain even one clear wire through.

Division Foreman Jacobs took charge and with Foremen Flannery, Dall, District Foreman Thurston and 30 men closed the gap with two miles of 5 pair okonite cable and some 15,000 feet of 17-2 wire. The pole line carried Boston-Bangor, Portland-Bangor and Waterville-Bangor circuits beside Waterville-Belfast, Dover, Newport and Pittsfield trunks. By establishing a circuit through Rockland in a roundabout way,

communication with Bangor was maintained and from the standpoint of the public commercial conversation was possible at all times.

The men engaged on the repairs deserve the highest praise for the way in which they went at the work, regardless of fatigue after long hard traveling — the nearest crew was 35 miles distant when the break was reported — regardless of miserable road and weather conditions, regardless of everything except circuits "through."

That the after conditions were really something to contend with may be seen from the fact that the roads and country were covered by a solid foot of half frozen slush. A pair of heavy horses could haul only ten or fifteen cross arms at a load.

Sleet storms are not to be wished for, but in Maine they are to be expected and without warning of sufficient duration to allow for even short prayer. They take 'em as they come. The wise ones say there are more coming this winter. If they come the chances are that this same report will hold true barring location and number of lines. Come on, you sleet storm.

ADDRESS BY HERBERT N. CASSON

EVERY member of The Telephone Society of New England who attended the meeting in Edison hall on December 13 was thrilled and inspired to greater effort by the remarkably able address on "The Social Value of the Telephone," by Herbert N. Casson, of New York. Although he calls himself "a professional outsider," he has acquired a marvellous grasp and understanding of a complex business after a study of but 15 months.

Mr. Casson told the telephone men a lot of things they had never thought of before. His address covered almost every phase of the business. Each point was made strikingly clear by illustrations that could not be misunderstood and great emphasis was laid upon the wonderful possibilities of the future. Although a number of eminent telephone experts have addressed the society the December meeting was, without qualification, the most interesting and instructive that has ever been held. Mr. Casson is a clever speaker, gifted with the expression of clear, logical thoughts, and a real thinker, and he held the close attention of his audience.

In opening the meeting President Munroe announced that L. H. Kinnard, commercial manager of the Bell Telephone Company of Pennsylvania, will speak at the February meeting, and that it was hoped that President U. N. Bethel of the New York Telephone Company will speak during the coming year. In his address Mr. Casson said:

"In opening I believe it is only fair that I should tell you why I am here tonight to address a meeting of telephone men, for it was only a comparatively short time ago that I began a study of your wonderful business. Some four or five years ago I started to make a series of histories of various industries that were born in the United States. After completing studies of the steel business, farm machinery and wheat, I began to look into the telephone business a little over a year ago and I find I can't get out of it.

"I dare say that almost any man in this room could, after an experience of six days, run a steel plant pretty well, or a plow factory, but very few telephone men can qualify for their own business, even after years of experience, because it touches every phase of life. There seems to be no end to it. It literally reaches into every back yard

Business Different From Anything Else

"I want to emphasize that it is a business that is different from anything else. It is young and expanding and growing all the time. The public doesn't even know the A B C's of the business today. It is so new that you are all the first generation men, students of an unknown force. A business is just like a person — it has its periods of babyhood, childhood, youth and old age, and the telephone business today is in the full flush and vigor of youth. Its greatest days are yet to come.

"Electricity and efficiency are to be the two great words of the immediate future. And you find, after a moment's thought, that both these words are combined in the telephone business and that they mean more in this industry than in almost anything else.

"The telephone business is not so well understood by the public as it should be. If a telephone exchange would only throw up sparks into the air when 50 calls came in over the switchboard, or make a great cloud of smoke, or a great noise, people would say: 'What a

great business.' It is unfortunate, so far as the education of the public is concerned, that the telephone is so noiseless.

"The telephone is not appreciated because the business has developed very few platform talkers. You men have all been so busy attending to your business that you have had no time for talk. Why, do you know the great Bell system, covering the entire United States with its network of wires, hasn't even got a textbook? When the time comes that such a book is written, the public will learn to appreciate the business, but today you are still gathering the knowledge for such a book.

Undervalue Work of Telephone Engineers

"We undervalue the brain work of telephone engineers, perhaps because they have made the telephone so simple. A little child can go to the telephone in Boston and say, 'Hello, papa,' and the childish voice goes out over the Alleghany mountains and over a thousand miles of slender wire and reaches the father instantly in some far western city. And people say: 'How very simple it is.' The wonder of it all has not yet been recognized.

"Here are two little discs. One is at my elbow, the other a thousand miles away. And when I speak into the one near me it shudders thousands of millions of times and the tiny electric current carries the shudder to the other disc far away and the inflections of my voice are reproduced. But how? Not all the scientists in the world can tell."

"One of the remarkable things about the telephone business is that it is run by greenhorns. It is run by the public, by people who know nothing about it. Here is the most delicate mechanism in the world and yet the telephone companies say to the public: 'Come in and operate it.' It is used by millions of people every day, of every class and condition. You don't even ask for a certificate of good character, but any man, drunk or sober, can operate this wonderful mechanism.

"Telephone service is a very young thing. A greater part of the plant is not over 10 or 15 years old. The first 20 years of the telephone business was almost wholly devoted to invention and development, divided into equal periods of about 10 years each. Bell himself made only the very beginning, not over two per cent, so that after he abandoned his activities 98 per cent of the telephone development had to be made.

"It was not until 1896 that the common battery system came into being and the telephone business became a real practical thing. It was not until then that the business became a great organization, and that little differences were adjusted and telephony was placed upon a national basis.

"Today there are 10,000,000 telephones in the world and 14,000,000,000 conversations were carried on last year. Today the average American family sends more telephone messages than letters. Half the telephones in the world are in the great Bell system, which has as much original capital as the Steel Trust. If all the people connected with the Bell system and their families were gathered in one place it would make a city as large as Baltimore and the telephone operators alone would fill 100 Vassar colleges.

"Sometimes people complain about the cost of telephone service. But when you consider that a great system worth millions of dollars is ready for the instant use of anybody at any time for the price of half a shoe

shine, the wonder is that there should be any criticism at all. The aim of telephony is universal service. Its value depends upon how far it will go and how many people it will reach. The telephone business is really a network of co-operation and you have to fit telephony like a garment around the needs and the habits of the people.

"The telephone has taught us the instinct of speed and the value of the second. It even cuts the seconds up into fractions. It has pulled time out and made it elastic. The telephone prevents clogging. Just imagine the conditions that would exist today in the large cities if we actually ran errands for each message carried over the telephone. In New York alone it would take 50,000 boys to run our errands. But the telephone cuts out a great part of this running back and forth. It enables a business man to perform today's work today. It enables him to do his work with his brains, not with his boots.

"It has been helpful to the organization of all other business. It has made the modern skyscraper possible, for it diminishes the number of elevators. It has also built up the suburbs, for it enables a man in the city to talk with his family 10 miles out in the country. It scatters the homes and concentrates the offices.

Telephone Sets the Mind Free

"Perhaps there is no more valuable thing that the telephone has done than in setting the mind free. It brings the answer the moment you send out the question. It relieves the mind and enables you to take up each new task with the mind free. It puts the brain always under the head of 'new business.'

"Great as have been the developments of the business in the last few years it still remains for the young men of today to establish some way by which actual conversation can be carried on between the Atlantic and the Pacific oceans, to find better insulating material, to make a universal code so that any man in any city can locate any other man in any other city, to devise transatlantic telephony and to simplify and decrease the enormous cost of the switchboard.

"The telephone has taught politeness in the social and business world. It has put business on a ball-bearing basis and eliminated the rough language and the discourtesy that was in the old days so universal. It has been the great civilization builder and has brought about mutual co-operation for mutual benefit. It has reorganized our daily life upon pleasanter lines and lifted it up to a higher and kindlier level."

At the close of Mr. Casson's address, brief remarks were made by Thomas J. Feeney, superintendent of advertising; Carl T. Keller, general commercial superintendent; F. P. Valentine, general superintendent of traffic; George H. Dresser, general superintendent of plant, George K. Manson, chief engineer, and Atty. E. K. Hall.

Sold 15 Car loads of Grain by Telephone

A man went into the Waterville, Me., central office a short time ago about 8.30 A. M. and passed several calls to the pay station attendant. At 11.30 A. M. he had spent \$7.38 in tolls and had sold 15 car loads of grain.

Not a bad investment when you consider what time and money it would have cost him to sell that amount of grain by personal calls on his customers.



OFFICERS OF LOWELL CHAPTER

Top row, left to right—H. H. Carter, chairman entertainment committee; R. G. W. Butters, secretary; J. D. Mac Farlane, entertainment committee. Middle row—Joseph Miller, treasurer; A. S. Haynes, president; W. F. King, vice-president; W. A. Emerson, entertainment committee. Bottom row—M. G. Perkins, corresponding secretary.

Prompt Service After Fire

On the evening of November 22 there was a fire in the cigar store of Estabrook & Eaton on Washington street, Boston. Telephone men were at the store almost before the fire was out. That this prompt service was appreciated is shown by the following letter:

BOSTON, Nov. 26, 1910.

General Manager,
New England Telephone & Telegraph Co.,
Milk street, Boston, Mass.

Dear Sir: We take this first opportunity to extend to you our thanks and sincere appreciation for the prompt and efficient manner in which your company assisted us at the time of the fire on our premises Tuesday evening, November 22, as you immediately had two men on the premises who connected us in such a manner that we could get outside connection, which was not only very kind to us, but immensely appreciated, and we extend to you our hearty thanks for your prompt and efficient service. We are

Yours very truly,

ESTABROOK & EATON.

The Way to Rise

The way for a young man to rise is to improve himself in every way he can, never suspecting that anybody wishes to hinder him.

Allow me to assure you that suspicion and jealousy never did help any man in any situation. There may sometimes be ungenerous attempts to keep a young man down; and they will succeed, too, if he allows his mind to be diverted from its true channel to brood over the attempted injury.

Cast about and see if this failing has not injured every person you have ever known to fall into it.—
Lincoln.

Asked Information to Step to Telephone

Recently a supervisor, in answering a call, received the following request: "Will you please have information step to the telephone." The situation was explained to the subscriber and he was requested to visit the exchange so that he might have a better idea of our system for his own information.

NEW SPRINGFIELD OFFICE

ABOUT midnight on Saturday, Dec. 3, the Bridge street office of the Springfield exchange passed into history and the new Worthington street exchange had its beginning. To the employees who for many months have been eagerly looking forward to this day, the event brought with it a feeling of deep gratification. For many weeks preceding the actual occurrence the cut-over has been the predominating topic of conversation in telephone circles in Springfield and the liveliest interest has been manifested by all, from messenger girl to superintendent, in the progress of the work.

The cut-over attracted a large number of telephone men from other districts and divisions, and representatives of the American Telephone and Telegraph Company and of the Western Union Telegraph Company were also present. Mr. H. S. Hyde, vice-president of this company, who has actively participated in the development of the new exchange from its beginning, demonstrated the keenness of his interest, not only by his own presence, but by that of Mrs. Hyde as well.

The cut followed the usual routine with which probably most of our readers are familiar. Toothpicks were inserted in the cut-off relays of the new board several days before the actual cut-over. On the night of the transfer it was almost midnight before the traffic dropped off to a point which would safely permit of the change. The toothpicks were then removed and for a short period the signals appeared on the old and the new switchboard simultaneously. This condition continued until it had been demonstrated to the satisfaction of those in charge of the work that no serious trouble with the new board was to be apprehended, when the heat coils were quickly removed from the frame in the old exchange, the operators moved up to the new switchboard and began to pick up the incoming signals and the cut-over was complete.

The first subscriber's signal on the new switchboard was picked up at exactly 11.59 P. M.

There is nothing particularly spectacular about a cut-over and to some it might seem a strange attraction which will bring men in large numbers from great distances to witness so perfunctory a performance. To the men who know, however, there is something really dramatic in the seemingly commonplace transaction, and for the few minutes of the actual cut-over there are many nerves more tense than usual, many pulses which slightly quicken their pace.

The Western Electric Company, the Plant and Traffic departments of our company are on trial and the verdict is inexorably rendered in these few minutes. In view of the painstaking testing and retesting, checking and rechecking of every detail of the apparatus there is hardly a chance that anything will go seriously wrong, and yet every man actively interested breathes more freely when it is all over. He knows what it means if any vital part of the system fails to perform its function.

From the results in this instance, however, it was evident that any anxiety as to the outcome had been unnecessary. The cut was most successful. Although the largest, with reference to the number of subscribers transferred, in the history of the company it is doubtful if there has ever been a cleaner cut. The troubles which developed were remarkably few and easily handled. Although the arrangement of the jacks and the

markings were entirely new the operating was particularly free from service errors and irregularities.

The new switchboard is one of the largest in the company, comprising 44A positions. The present multiple equipment is 6600 lines with an ultimate capacity of 10,000 lines. There are 6 B and 6 information desk positions.

The building in which the new exchange is located is a new company building, used exclusively for telephone purposes, and the largest yet erected by the company. It is four stories in height, of granite, stone and terra cotta brick construction, of mosaic flooring and marble tiled hallways. In both outside and inside appearance it is a structure of which the company may well be proud.

In the laying out of the offices each department has been consulted and arrangements made to accord with the convenience and taste of those directly concerned. The company has been particularly generous in fitting up rooms for the convenience and comfort of the operators and leather covered chairs and settles, reading tables, book case, lace curtains and magazines are included in the furnishings of the rest room. A model kitchen, completely furnished, is also included in the suite of rooms fitted up for the exclusive use of the operating force.

Following the usual custom, a public reception will be held in the new building as soon as it is deemed expedient to do so.

TRAFFIC CHAPTER STILL GROWING

THE regular monthly meeting of the Traffic Chapter was held at the Hotel Bellevue, November 22.

During the social half hour from 7.30 until 8 o'clock the members were entertained with several violin selections by Henry Ridgeway, accompanied by M. E. Berry.

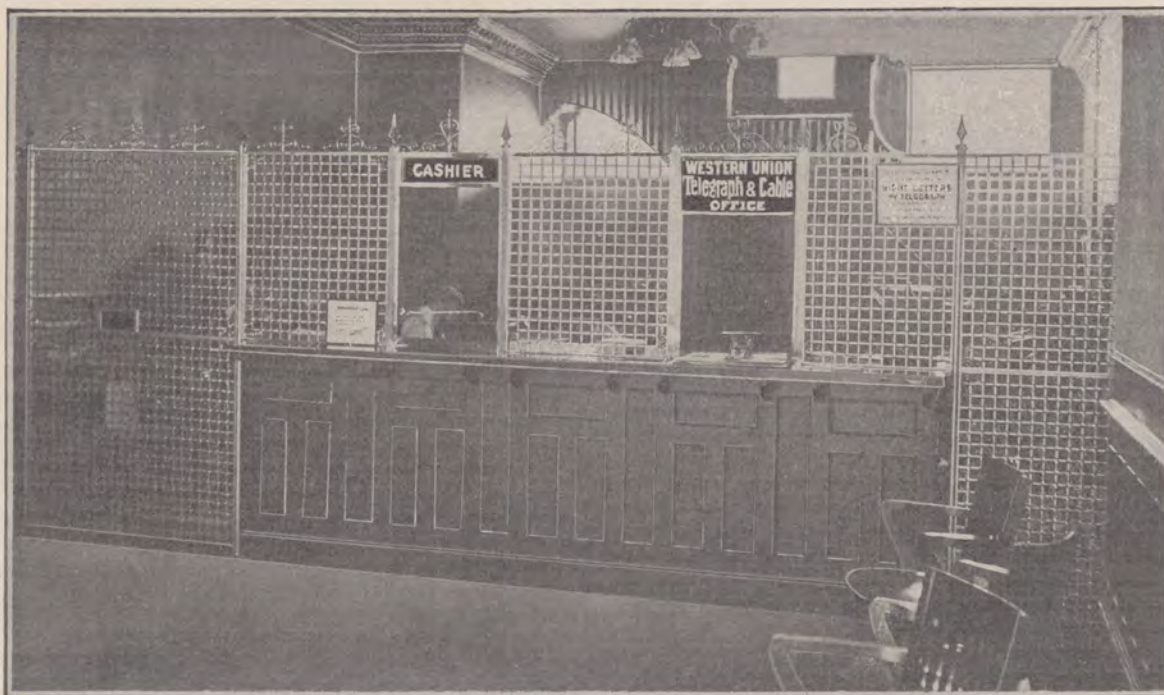
Nineteen employees were elected to membership. After the business of the meeting was disposed of, the president introduced B. J. Bowen, traffic engineer, who spoke at some length on "The New Metropolitan and Suburban Service."

Mr. Bowen was followed by F. P. Valentine, general superintendent of traffic, who reviewed the early history of conditions responsible for the present rate changes, from the time of the enactment by the Legislature of the law placing the telephone company under the supervision of the highway commission through the numerous hearings before the commissioners down to conditions as they exist today.

That a keen interest is being taken in the Traffic Chapter doings is very evident from the manner in which the meetings are being attended.

Employees Study Esperanto

Several employees of the company have taken up the study of Esperanto and have joined the Boston Esperanto Society. There is a public class at the Boston Public Library on Tuesdays at 8 P. M. and free instruction is given. Norman H. Hastings of the Plant engineering department, 170 Summer street, will be glad to answer any questions or give any desired information regarding the new international auxiliary language. Arthur Baker, editor of "Amerika Esperantisto," 700 East 40th street, Chicago, will send a grammar to any one who asks for it and encloses a stamp for reply.



COMBINATION TELEPHONE AND TELEGRAPH OFFICE AT AUGUSTA, ME.

Since the American Telephone and Telegraph Company Acquired Control of the Western Union Telegraph Company, Some Months Ago, Several Innovations for the Benefit of the Public Have Been Put into Effect. The Picture Shows One of These Improvements

NEW POLE PULLER WORKS WELL

A SO-CALLED "pole puller" which has been in use in the Portland district for some time is "making good." While the apparatus probably is by no means new to construction men, still its use has not been general. It is efficient on any sort of pole up to and including 35 feet chestnuts, lifting them smoothly and with comparative ease to the point from which they may be lowered to the ground with pikes.

The method is economical, the cost per pole for removals being about one-third that of the old digging method, and the cost of the apparatus itself is comparatively nominal, about \$8.00.

The material used is white oak. The principle on which it works is very simple. A joist, approximately 12 feet long, is mounted on a solidly built truss framework to which the joist or lever is securely pinned by an axis which is placed about a foot from the end of the lever. The tip of this short end is fitted with an iron split toe, the slot of which readily fits the links of an ordinary 1½ inch chain. The chain, equipped with a ring in one end, encircles the pole at the butt, slip noose fashion; a link in the loose end is fitted into the slot of the lever; pressure is brought to bear on the lever's long end, using the frame axis as a fulcrum, and the pole starts.

Occasionally a pole can be "pumped" out, using the lever exactly as one does a pump handle, the chain, after each stroke, falling back into position of its own weight. The apparatus at present in use is not heavy nor strong enough to stand up under the strain of lifting out larger than 35 foot poles, and it is doubtful if the heavier build would prove practical.

QUESTION BOX

Question. — Please explain why central office battery is grounded on the positive side.

Answer. — Further replying to the above question which appeared in the July number of TELEPHONE TOPICS:

At Worcester and Back Bay, in the early days of the common battery system, the negative side of the central office battery was grounded. So much trouble resulted, due to electrolysis, that it was found necessary to ground the positive side.

When the negative side of the battery is grounded there is a tendency for this action to attack the positive wire in a cable both from the sheath and its mate; whereas, if the positive of the battery is grounded there is practically no action on the wire as it is shunted by the sheath, etc.

This electrolytic action is a form of decomposition or corrosion which occurs when current of positive polarity flows from a cable, wire or other conductor to earth or conductor of negative polarity, the decomposition being found in the conductor of positive polarity.

The advantage gained by permanently grounding the positive side of the central office battery is that the leak if any, from cables or wires to earth is always in the opposite direction from that which would tend to produce a corrosive action in the cable or line, as this action is at the positive pole only.

The nascent oxygen set free by the electrolytic action of the current, the line being negative to the earth, is released at the earth connection, while the hydrogen is set free at the cable or line wire; resulting in the absence of line corrosion in such cases.

NOTES FROM THE FIELD

BOSTON AND SOUTHERN MASSACHUSETTS
DIVISION

The following men passed examination for first-class rating before the Examining Board: Matthew J. McGrath, line repairman, Quincy district; Neil J. Cronin, head installer, equipment foreman; Francis A. Mahan, Jr., head installer, equipment foreman; John E. McCombie, sub-station installer, Jamaica Plain district; John Burns, lineman, division foreman; James McDonald, lineman, Somerville district; Ralph G. Longfellow, sub-station installer, Metropolitan district; Edward F. McDonough, head lineman, Metropolitan district; Henry A. Maurer, sub-station installer, Metropolitan district; Stanley E. Latham, sub-station installer, Metropolitan district; Arthur L. Barry, head lineman, Metropolitan district; Fred McIntyre, lineman, Somerville district; C. H. Graham, head lineman, Newton West district; William J. Dods, head lineman, Metropolitan district; Norbert T. Long, head installer, equipment foreman; George B. Joslin, head installer, equipment foreman; John I. Hyland, Central Office repairman, Quincy district; John J. McDonough, sub-station repairman, Metropolitan district; Percy E. Grant, head installer, equipment foreman.

Traffic changes: Mrs. Ethel D. Johnson has been transferred to the Main exchange from Richmond, to fill the position of chief clerk made vacant by the resignation of Miss Minnie B. Nute, who has accepted a position in the Order department. Margaret J. McDonough has been promoted to chief clerk at Richmond, in place of Mrs. Johnson. Miss Veronica F. O'Brien has been transferred from local supervisor, Waltham, to local supervisor, Newton North. Miss Mae U. Thompson has been transferred from local supervisor, Newton West, to a similar position at Waltham. Miss Mabel G. Shea, senior operator, Newton West, has accepted the position of clerk at Newton North. Miss Eva J. Cook, formerly toll supervisor at New Bedford, has been promoted to chief operator. George L. Walker has been promoted from night chief operator in Salem to traffic inspector. P. H. O'Neill, traffic inspector, has been transferred to the Commercial department. Percy S. Farrar has been transferred from traffic inspector to a position in the office of the general supervisor of traffic.

The linemen and instrument setters of the Cambridge exchange, having moved into their new stockroom, had an oyster supper on the evening of December 12 by way of christening their new quarters and were entertained by George Thomas Shiner, the comedian of the instrument setters. Those present were William B. Dunn, Walter D. Dunn, Harold E. Bates, Arthur W. Haviland, William J. Haviland, Joseph J. Cuneo, Joseph J. Monahan, George Thomas Shiner, Leon T. DeMontier, Fred Johnson, John A. Wheelock, Charles T. Bent, Everett T. Dover, Clifford L. Baker, Edward J. Klatenberg, C. Henry Vinal, James A. Scott, Arthur B. Hampton.

At a meeting held in the wire chief's office, New Bedford exchange, on Nov. 30, by the Plant department of the New Bedford exchange, it was voted to hold a series of meetings throughout the winter for the purpose of gaining a more thorough knowledge of

telephony, embracing the theoretical as well as the practical side. Twenty-one members were present and the interest shown makes assured the success of the future meetings. It was voted to be known as the New Bedford District Plant Chapter. A president, secretary and a committee of two to select the speakers for the following meetings were elected.

Business in the Malden district has expanded to such an extent that it has become necessary to lease new quarters for the accommodation of the Commercial department. The new location is on Main street, Malden, in upper Malden square, on the street floor and easily accessible to the public. The space vacated by the Commercial department in the exchange building will be immediately available for the Plant department and the change will greatly facilitate the operations of both departments.

Through the kindness of Mrs. Shaw, matron in Main exchange, the operators who were on duty Thanksgiving day enjoyed a full course turkey dinner served at cost price. All other employees who were not going to eat their dinner at home were given the privilege of coming to the exchange. In this way the day passed pleasantly for all.

Owing to the increase in work in the Traffic, Commercial and Plant departments in the Somerville district office, it has been found necessary to move the Plant department office. The "house next door" has been purchased and is now in course of preparation for occupancy by the Plant department.

To accommodate the increasing number of subscribers in the Dorchester exchange the Western Electric Co. is installing 1000 additional lines in the switchboard and on the completion of this work will place two additional sections and add 800 more lines throughout the switchboard.

Owing to increase of business the Commercial department has outgrown its quarters at Quincy and to provide additional accommodation it has been found necessary to move the field engineers' force to a room in the basement of the building, where they have more light and better accommodation.

During the four weeks ending Nov. 3, 1910, there was completed in the several exchanges of the Metropolitan district 7928 R orders as follows: Main and Fort Hill, 3,041; Back Bay, 1,934; Haymarket, 872; Tremont, 849; Oxford, 734; Richmond, 496.

Additional quarters have been acquired in the Dorchester exchange building and work has been commenced equipping them for use as operators' retiring and locker rooms, their present quarters being required for switchboard and clerical accommodation.

A meeting of the wire chiefs was held at the Newton West district building on November 26. The discussion was on the handling of orders and the laying out of the work.

I. O. Wright, superintendent of Plant, Boston division, spoke on "Evolution" before the Accounting-Commercial Chapter at the American House, Boston, on December 16.

Preparations are being made to move the central office quarters in Stoughton from the present site on Wyman street to a more desirable one in the square.

Work on underground conduit between the railroad track and Cedar street was started Dec. 1, 1910, at Hyannis. This covers approximately 1900 feet.

A new 400 pair underground cable has been placed in the New Bedford exchange, providing additional facilities for the north end of the city.

WESTERN DIVISION

A conference of managers of the Pittsfield district was held on November 21 at the American House, Pittsfield, at which discussions were held on various matters. In the evening a meeting of the Pittsfield-Greenfield chapter was held. C. T. Keller, general commercial superintendent, Boston, gave a very interesting address on the growth of the telephone business. It was voted at this meeting to allow the Greenfield members to withdraw from the Pittsfield-Greenfield chapter so that they might be able to form a chapter of their own in the Greenfield district. It was also voted to hold the next meeting at North Adams.

At 9.30 A. M., on November 29, word was received that the hotel near the building in which the automatic exchange at Princeton is located was afire. The Plant department at once sent men to Princeton and at 12 o'clock had a line working, as the exchange had been so wet down that it was rendered useless. A small P. B. X. was installed and an operator sent from Worcester, and at 7 o'clock that night practically all subscribers had service.

The following is from the daily *Hampshire Gazette* of Northampton: "The *Gazette* collected the returns and gave them out to many hundreds of inquirers. One of the things that we wonder at every election night is how the telephone girls can keep pleasant and answer so many calls for the same number, hour after hour. The public owes them appreciative recognition for their cheerful service on election night."

On November 12 the Palmer exchange was moved from the Lynde block, where it has been for nine years, to the new post office building on Main street. The new quarters are a great improvement on the old office, as the Commercial, Plant and Traffic departments all have separate offices, while in the old office these departments were all in one room.

At a recent meeting of Pacific Lodge of Masons, it was voted: That the New England Telephone and Telegraph Company be extended a vote of thanks through its representative, Mr. Willis B. Fay, for the courtesies extended to us on this and former occasions, namely, the receipt of returns of elections."

The Flying Squadron in charge of Mr. Watson has just completed a canvass in the Worcester exchange with a net gain of 325 subscribers. Out of this number there were only six contracts rejected on account of being undesirable subscribers.

Following is the average of uncollected accounts in the Palmer and Ware, Mass., exchanges on November 30: Warren, \$.28; Ware, \$.28; Palmer, \$.41; Brimfield, \$.43; Gilbertville, \$.51; Monson, \$.54; Enfield, \$.63.

On January 1, 1907, the uncollected at Milford was \$4.02 per subscriber, and at Franklin, \$4.30 per subscriber, while on Dec. 1, 1910, the average for the two towns combined is 59 cents per subscriber.

Foreman B. J. Doyle and crew who have been working at Burlington and Rutland, Vt., for the past two months, placing cable on various streets, have about completed the work.

The Chicopee operating force has succeeded in furnishing "100 weight" service for three consecutive months. Good work, Chicopee. Keep it up.

Contract Agent Fay of Worcester was successful in securing additional subscribers enough to double the present Upton exchange.

The storm of November 29 did considerable damage to the lines in the Greenfield district, but the men

were on their job and cleared them up in a short time.

F. M. Holiday, district foreman, has resigned and was succeeded by B. B. Britt, formerly gang foreman, as active district foreman.

Foreman Duxbury and men are placing an aerial cable at Sheffield, Mass., down Main street, thereby doing away with the present ring work.

The remodeling of the telephone company's building at Pittsfield will be started at an early date.

CENTRAL DIVISION

The telephone office at Farmington, N. H., is now located in the Thayer building on Central street. The switchboard and other office furniture was moved at midnight on November 22. The work was done by members of the Plant department of the Manchester, N. H., district. The work was planned ahead so that subscribers were out of service about 40 minutes. The present building is situated in the center of the town, directly opposite the ruins of the building in which the office was located up to the time of the fire last March. The office quarters comprise two rooms which are tastily decorated and well lighted.

The Flying Squadron in charge of F. B. Watson, is making a house-to-house canvass in the Nashua, N. H., exchange and has already signed 30 new contracts, which is a creditable showing, in view of the fact that the exchange has a high percentage of development, according to the population.

Mr. J. Cunningham is splicing a 400 pair underground cable, recently pulled into duct on Temple street. When completed we shall be provided with additional facilities much needed in this section of the city.

The toll operators in the Fitchburg exchange are rejoicing over the progress made in reducing Item C. Thursday, December 8, the day's average was 21 seconds, the standard average being 70 seconds.

Miss Nora Noonan has been appointed chief operator at Exeter, N. H., taking the place of Miss H. H. Jennings, resigned. Miss Noonan has been connected with the company for 12 years.

Robert M. Bradlee, contract agent for two years at Dover, N. H., has been transferred to Concord, N. H.

Death of Thomas F. Strange

Thomas F. Strange, an employee of the Southern Massachusetts Telephone Company for many years, died at the Morton Hospital, Taunton, on November 23, after a brief illness. He was a native of Freetown and his first association with the Southern Massachusetts Telephone Company, with which concern he had labored many years, was in 1879 when, under Abner Coleman, manager at that time, he secured a position as night operator, collector and combination man.

He held the position under Manager Coleman until 1881 and from that time until 1902 was employed as contract agent. On Feb. 1, 1902, he was appointed manager. After a year as manager he was restored to his former position as contract agent by his own request. From 1886 to 1889 he was employed as a pharmacist in New Bedford, but returned to the work he loved best.

He was a member of the Telephone Employees' Association of New England and was widely known. The funeral was held on November 26 and a large number of telephone associates were present.

TELEPHONE EMPLOYEE'S ASSOCIATION

AS the next report of the Telephone Employees' Association to be published will be for a period of 18 months, members may desire to compare the present condition of the association with the condition shown in the annual report of a year ago, viz., Nov. 30, 1909.

The members in good standing Dec. 30, 1910, are: Class A, 506; class B, 883; both classes, 573; a total of 1,962 against 1,575 a year ago. There are 1,079 class A and 1,456 class B members, an increase during the year of 275 class A and 192 class B members.

Our assets are \$46,851.07 as against \$41,875.18 a year ago, a gain of \$4,975.89 during the year. Of this amount the death and disability fund, including the reserve fund, is \$45,337.73, as against \$40,450.96 last year, a gain of \$4,886.77. The social fund is \$1,249.99 as against \$1,050.05 the previous year, a gain of \$199.54. The expense fund is \$263.35 as against \$374.14 at the last report, a loss of \$110.82.

We are now drawing \$2,700 per annum from the New England Telephone and Telegraph Company for interest on the funds deposited with the company as trustee. This is nearly as much as is paid in by one-third of all the Class B members, and when it is remembered that Class B members have drawn out nearly all that they paid in during the year, it will be seen that without this interest on this fund, and the donations of the telephone company, the dues collected would not meet the normal benefit liabilities of the association.

The gain in class B funds during the year was net \$4,776, of which \$1,500 was a donation from the telephone company and approximately \$2,700 interest, a total of \$4,200. Only \$576 was paid in by members over the amount paid out for benefits and expense.

The amount paid for benefits during the year was \$7,190.32, \$2,131.10 less than was paid out during the preceding year, although our membership in class B is about 15 per cent greater at the end of the year than it was at the end of last year.

If our claims for benefits had been in the same ratio to members during the past year that it was in the preceding year, the amounts paid in by members would have fallen about \$3,500 short of paying our benefit liabilities, from which it appears that unless we continue to be favored with donations from the company we may find that our present low rate of dues will not meet our benefit liabilities and extra assessments may be necessary, but it must be borne in mind that members only pay two-thirds as much now as they did in former years.

New members have the advantage of the earnings on the fund we accumulated by the higher rates which we paid during the first nine years of our existence and get insurance at less than actual cost, which is made possible by the fact of our reserve fund, and the generosity of the New England Telephone and Telegraph Company which we hope, and I believe have reason to expect, will continue.

Standing of the Telephone Employees' Association of New England, Nov. 30, 1910:

Members, 1909	
Reserve funds,	\$46,000.00
Other funds,	1,851.07
	<hr/>
	\$47,851.007

Benefits paid during November to Charles Newton, Springfield, Mass., \$45.72; William S. Grimmer, Brockton, Mass., \$27.15; Burt P. Carr, Rutland, Vt.,

\$40.00; John Y. Bradbury, Hingham Center, Mass., \$10.00; Michael J. Rooney, Waltham, Mass., \$7.15; John K. Butler, Hebron, N. S., \$110.00; Joseph Mar- rion, East Boston, Mass., \$37.15; John A. Nares, East Boston, Mass., \$4.29; Harry V. Cole, Portland, Me., \$27.15; Raymond Ahearn, Hingham, Mass., \$11.43; J. N. Watts, Riverside, California, \$50.00; Henry Healey, Worcester, Mass., \$17.13; Levi Joire, Hing- ham, Mass., \$8.58; George Gillis, Lawrence, Mass., \$48.58; E. H. Averill, Springfield, Mass., \$20.00; Adam Tait, East Boston, Mass., \$12.86; Daniel McEachern, Somerville, Mass., \$30.00; I. C. Cross, Rockland, Me., \$7.15; Geo. Leduc, Burlington, Vt., \$40.00; Thomas F. Conway, Lowell, Mass., \$20.00.

J. A. McCoy, Secretary.

LOWELL AND MANCHESTER CHAPTERS

THE first annual dinner of the Lowell and Manches- ter chapters of the Telephone Employee's Asso- ciation was held November 26 at Nashua, N. H. The attendance exceeded all expectation. About 200 sat down to dinner.

It was an unexpected pleasure to hear from J. A. McCoy, popularly known as the "father" of the Tele- phone Employee's Association. He impressed upon all the benefits accruing from a Class "B" membership. A rousing reception was given him.

F. C. Munroe, president of the Telephone Society of New England, explained the efforts that are being made to merge the society and association. The ten- tative plan that has been drawn up by the joint com- mittee was outlined in detail.

The next event was an entertainment by the Em- pire Minstrel Company. The local hits showed that they had received good coaching from telephonic sources.

H. A. McCoy was next introduced. His long expe- rience in telephone work gave him an abundance of material for an over interesting retrospect. Philip Harvey, special agent to General Superintendent of Plant Dresser, supplemented Mr. Munroe's remarks regarding the merger and held out the hope that the company was going to take a more active interest in the work of the chapters.

THE BOSTON PLANT CHAPTER

THE "Running of the Subscriber's Loop" was the topic at a meeting of the Boston Plant Chapter at the American House, Boston, on December 2. Papers were read by George J. Rauh, field engineer, Metropolitan district, from the standpoint of the underground cable engineer; Harold E. Tarr, field engineer, Jamaica district, the aerial cable require- ments; Charles F. Barker, district foreman, Somerville district, the wiring from the end of the aerial cable to the house of the subscriber; E. E. Sodergren, head installer, Metropolitan district, the substation installa- tion.

A real live general discussion followed the presenta- tion of the papers, during which Charles E. Ames, district wire chief, Somerville district, assisted the four speakers in clearing up several obscure points regarding loops, upon which those present were in doubt.

It was agreed by all to be the most interesting and instructive meeting held by the Boston Plant Chapter for some time. President R. E. Healey announced that L. W. Abbott, assistant engineer, would address the chapter on Jan. 6, 1911, on "Central Office Equip- ment as Affected by the Revised Rates."

COLLECTION RATINGS

Collection ratings this month, 14.7; last month, 15.2; Manchester district having first place with an average of 7.2; Greenfield and Fitchburg districts being tied for second place, averages being 9.5.

Manchester Dist. (Cent. Div.), H. W. Worthley, Dist. Mgr.

Claremont, C. G. Adams, Manager.....	2.1
White River Junction, F. A. Carr, Manager.....	3.6
Nashua, F. L. Towey, Manager.....	5.9
Manchester, R. M. Mandell, Manager.....	6.0
Dover, W. J. Webb, Manager.....	7.1
Concord, C. A. Weston, Manager.....	10.5
Portsmouth, E. H. Drew, Manager.....	11.1
Average for the District.....	7.2

Greenfield Dist. (West. Div.), F. P. Langmaid, Dist. Mgr.

Keene, P. C. Lockwood, Manager.....	4.3
Bellows Falls, H. W. Buzzell, Manager.....	6.4
Brattleboro, R. J. Eldredge, Manager.....	10.4
Athol, E. E. Mellen, Manager.....	10.8
Greenfield, F. P. Langmaid, Manager.....	14.9
Average for the District.....	9.5

Fitchburg Dist. (Cent. Div.), C. W. Dufresne, Dist. Mgr.

Clinton, J. J. Barry, Manager.....	4.4
Gardner, George A. Towey, Manager.....	8.9
Winchendon, E. F. Sidley, Manager.....	9.6
Fitchburg, F. E. Bowker, Manager.....	10.2
Ayer, J. J. Barry, Manager.....	10.4
Marlboro, George Butterfield, Manager.....	10.4
Average for the District.....	9.5

Lowell Dist. (Cent. Div.), C. F. Grover, Dist. Mgr.

Haverhill, R. B. Rood, Manager.....	8.7
Lawrence, F. G. Cheney, Manager.....	8.9
Newburyport, D. B. Collins, Manager.....	10.9
Lowell, C. J. Leathers, Manager.....	12.4
Average for the District.....	10.4

Pittsfield Dist. (West. Div.), H. E. Hughes, Dist. Mgr.

North Adams, W. H. Stedman, Manager.....	8.0
Pittsfield, W. I. Mellen, Manager.....	9.8
Great Barrington, F. P. Tucker, Manager.....	13.5
Bennington, W. E. Bissell, Manager.....	18.1
Average for the District.....	10.7

Salem Dist. (Cent. Div.), R. Robins, Jr., Dist. Mgr.

Gloucester, John Gadd, Manager.....	7.8
Salem, R. P. Butterick, Manager.....	9.3
Lynn, F. A. Phillips, Manager.....	13.6
Average for the District.....	11.0

Portland Dist. (East. Div.), C. F. Story, Dist. Mgr.

Lewiston, W. I. Noyes, Manager.....	11.3
Biddeford, F. S. Goodwin, Manager.....	11.7
Portland, A. T. Stewart, Manager.....	11.7
Augusta, E. I. Herbert, Manager.....	12.2
Bath, S. E. Austin, Manager.....	13.6
Average for the District.....	11.9

Springfield Dist. (West. Div.), L. B. Stowe, Dist. Mgr.

Westfield, George B. Church, Manager.....	5.0
Palmer, C. W. Chamberlin, Manager.....	7.8
Northampton, A. Proctor, Manager.....	11.5
Holyoke, H. R. Leathers, Manager.....	15.3
Springfield, H. L. Sanborn, Manager.....	15.6
Average for the District.....	13.8

Bangor Dist. (East. Div.), E. T. Emerson, Dist. Mgr.

Calais, J. H. Broadbent, Manager.....	4.9
Dover, F. W. Mason, Manager.....	9.0
Machias, J. C. McFaul, Manager.....	12.8
Waterville, S. Wing, Manager.....	15.2
Bangor, E. T. Emerson, Manager.....	15.4
Bar Harbor, J. C. McFaul, Manager.....	18.6
Average for the District.....	14.0

Worcester Dist. (West. Div.), C. J. Abbott, Dist. Mgr.

Southbridge, A. K. Burrows, Manager.....	8.4
South Framingham, E. P. Wilbur, Manager.....	13.2
Worcester, C. E. Wilkins, Manager.....	15.3
Milford, S. H. Walley, Manager.....	16.1
Average for the District.....	14.8

New Bedford Dist. (So. Mass.), J. F. Hall, Dist. Mgr.

Falmouth, C. C. Craig, Manager.....	6.9
New Bedford, W. C. Foote, Manager.....	15.5
Hyannis, A. T. Stuart, Manager.....	15.6
Fall River, F. H. Grover, Manager.....	16.3
Nantucket, D. Y. Potter, Manager.....	420.0
Average for the District.....	15.4

Brockton Dist. (So. Mass.), George Knox, Dist. Mgr.

Taunton, G. H. Gates, Manager.....	13.7
Plymouth, W. H. Parsons, Manager.....	15.5
Rockland, R. B. Starbard, Manager.....	16.6
Brockton, C. C. Starbard, Manager.....	17.8
Average for the District.....	16.2

Burlington Dist. (West. Div.), W. H. Fox, Dist. Mgr.

Rutland, R. D. Beals, Manager.....	16.3
Burlington, W. H. Fox, Manager.....	18.2
Average for the District.....	17.4

Boston Division, D. W. Moffit, Collection Mgr.

Dorchester:.....	A. H. Holland, Collector	13.5	
Cohasset, Hingham, Hull, Weymouth, Braintree:Geo. W. Despeaux, Collector	13.7	
Newton South, Newton North, Brighton, Newton	West, Wellesley.....	W. J. Barkley, Collector	13.9
Brookline:.....	J. W. Gibson, Collector	14.1	
Roxbury:.....	C. G. Symonds, Collector	14.2	
East Boston, South Boston, Winthrop:.....A. S. Nickerson, Collector	15.0	
Cambridge, Belmont:.....	C. E. Delehanty, Collector	15.0	
Jamaica Plain, Milton:.....	G. W. Murray, Collector	15.3	
Somerville, Charlestown:.....	C. L. Damon, Collector	16.3	
Boston: O. A. Atwood, J. A. Montgomery, J. G.	Baxter, C. G. Symonds, J. E. Gardiner, E. S.	Mogan, Collectors.....	17.9
Canton, Needham, Quincy, Randolph, Sharon,	Stoughton.....	F. Tobin, Collector	18.0
Malden, Medford, Melrose:.....G. L. Higgins, Collector	18.4	
Maynard, West Acton, Concord, Arlington, Lex-	ington, Lincoln, Waltham, Wayland:.....J. L. Barker, Collector	18.5
Reading, Stoneham, Wakefield, Winchester,	Woburn, North Reading, North Wilmington:W. Leiber, Collector	20.5
Chelsea, Everett, Revere:.....R. G. Lombard, Collector	22.2	
Dedham, Hyde Park, Foxboro, Medfield, Norwood,	Walpole, Wrentham:.....C. E. Hersom, Collector	23.4

Division Ratings

Central Division, T. E. Parker, Supt.....	9.5
Eastern Division.....	12.6
Western Division, F. G. Daboll, Supt.....	13.4
Southern Mass. Telephone Co., J. H. Barry, Supt.,	15.8
Boston Division, J. H. Barry, Supt.....	17.1
Average for N. E. T. and T. Co.....	14.7

Record of Bookkeepers—Auditor's Department

	Supervisor White	Supervisor Healy	Supervisor Wilson	Supervisor Whittier	Supervisor Dismore	Supervisor Williams
No. of Bookkeepers,	7	9	8	9	9	8
No. of Errors,	3	6	7	9	10	15
Average Errors per Bookkeeper,	3-7	2-3	7-8	1	1 1-9	1 7-8
No. of Bookkeepers making no errors,	5	4	3	3	5	4
No. of Subscribers' accounts,	12502	15300	12874	15373	15233	15607
Errors per 1000 subscribers' accounts,	23-100	39-100	54-100	58-100	63-100	96-100

187 Call-Back Tickets in Two Hours

During a busy period of two hours on election night, 187 call-back tickets were completed by the Portland supervisors for one of the local papers. As a tribute to the efficient service on election night, many compliments from our subscribers were received.

The committee at Republican headquarters extended thanks to the chief operator and advised him that it was the best service ever received, and further remembered the operators with a large basket of candy.

Subscribers Connected Month of November, 1910
The New England Telephone and Telegraph Company
and
The Southern Massachusetts Telephone Company

	Connected	Disconnected	Transfers from one class to another	Net Gain	Total Nov. 30, 1910
Exchange Stations	6424	4614	— 14	1796	244546
P. B. X. Stations	567	170	+ 83	430	39604
Extension Sets	858	521	— 19	318	30875
Total Owned	7849	5305	0	2544	315025
Service Stations	19	2		17	626
Private Line Stations				— 38	5523
Sub-Licensee Stations				208	54804
Grand Total				2731	375978



SOUND PROOF
Telephone Booths

The best are made by
C. H. BROWNELL
Peru, Indiana

Apply to
Western Electric Co.
BOSTON

Waited for Girl in Telephone Booth

A man recently went into a Lewiston hotel and asked the clerk how much it would cost him to talk to his home. The clerk told him to step into the booth and ask the girl.

The man remained in the booth half an hour and then came out and told the clerk he couldn't wait any longer as he had been in the booth half an hour and no girl had come in yet.

WARREN H. COLSON



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