THE VALUE OF A TELEPHONE IN RAILROAD WORK

THE VALUE OF A TELEPHONE IN RAILWAY WORK AS APPLIED TO THE OPERATION OF

STEAM ELECTRIC AND INTERURBAN RAILWAYS

Stromberg-Carlson Telephone Mfg. Co.
Rochester, N. Y.

Western Sales Office
Chicago, Ill.

INTRODUCTORY

IN presenting this booklet to the Transportation Companies and allied interests, we do so with a view of briefly illustrating and describing some of the most important features contained in our apparatus.

The equipment has been especially designed to meet the most exacting requirements of perfect communication at all times for despatching purposes, and between the various departments of companies requiring reliable and efficient service.

In the manufacture of this apparatus special care and attention has been given to details and have had constantly in mind the hard and exacting service, together with the severe conditions to which such apparatus is constantly subjected. We do not attempt to furnish an equipment for ordinary use, but especially designed instruments to meet the most rigid and severe usage, employing nothing but the most approved mechanical and electrical features known to modern telephone engineering, which is sold outright, and fully guaranteed by the Stromberg-Carlson Telephone Manufacturing Company.

Birdseye View of Plant and General Offices
Stromberg-Carlson Telephone Mfg. Company
Rochester, N. Y.

Western Sales Office
Chicago, Ill.

THE large increase in the number of Interurban Railways, both Electric and Steam, the need of rapid and frequent train service, the desire and advisability of a more flexible system, has made necessary a change in the old methods of issuing orders to conductors, engineers and motormen. The telegraph with its copied orders is not practical where stations are close together, the Block system is too expensive to maintain. There is but one perfect system, the Despatching Telephone. No mistakes can be made, no guess work, no wrongly read orders—the correct understanding of an order is acknowledged as soon as it is delivered.

The method of applying telephones to railway trains and electric cars is as follows: Each train, or each car, if an electric railway, is equipped with a semi-portable telephone of the type as shown on

FIG. 1

FIG. 2

pages 18 and 19 of this booklet. This telephone can be used direct from the car by making connection with the telephone line wires in one of two ways.

1st. By bringing into use the cord and plug with which each instrument is provided, insert the plug in the jack box, which is usually mounted on a pole at the switch or along the track. These are located at intervals along the line wherever they are needed.

2nd. By using our jointed extension pole which is provided with a jack, mounted in the lower end, in which the plug, attached to the telephone, is inserted same as in the plug box above described. The opposite end is provided with two hooks for catching the line wires. The pole is jointed, thoroughly wired, well and substantially built, and when put together is electrically connected. Thus, in the open country and where there is no plug box at hand, instant communication can be had by this means with the Despatcher, Superintendent, or with any station on the line.

If desired, the telephone, consisting of the upper part of the instrument containing the transmitter and receiver, may be removed from the car and used at the pole. This plan of making it possible to use the telephone either on or off the car permits using the instrument under any conditions.

The Central Energy System

The Central Energy System as applied to our apparatus contains numerous advantages for this particular class of work which cannot be obtained otherwise. Some of these chief points of merit are: The energy for operating the system is centralized at one point, furnishing uniform current available at all times, quickness and reliability of operation, minimum cost of maintenance. It is the IDEAL system for use where rapid and efficient service is required. This system is especially recommended for city use.

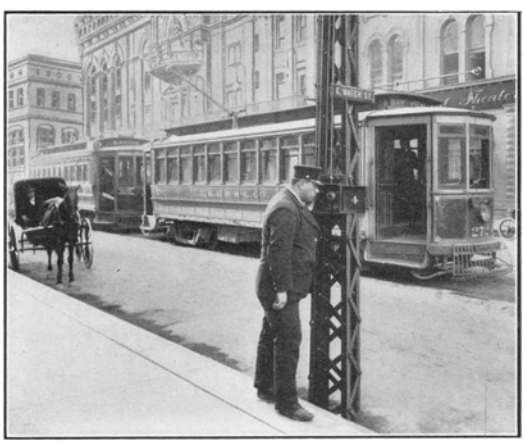

FIG. 3

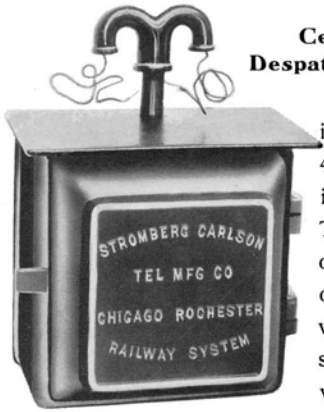

FIG. 4

Central Energy Despatching Telephone

The instrument illustrated in Fig. 4 represents our iron box Railway Telephone. The outer case is made of heavy cast iron, which has been specially treated with a rubber insulating enamel compound, which does not crack or chip. The outer door of the case closes against a rubber gasket, rendering the interior free from moisture and dampness. The mechanism is entirely protected by the inner case, which is locked and only accessible to persons having charge of the maintenance. The various parts of the apparatus not considered part of the circuit, such as magnet cores, screws, hinges, etc., are made of brass, copper plated and nickel dipped, to prevent rusting. The parts are mounted on the inner case door. When this is opened the apparatus is accessible for inspections, tests or repairs.

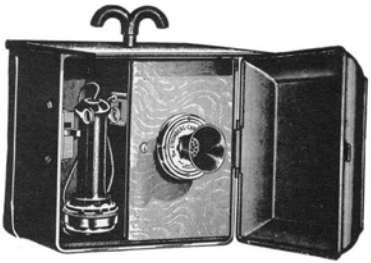

FIG. 5

FIG. 6

We have devised a scheme for cutting out instruments from the line, called a line cut-out. This device may be furnished when specified, and is intended as an absolute line disconnector when the receiver is hung on the hook and the outer case door closed. This makes it impossible for any high potential current affecting the instrument when not in use.

Cut-In Jack or Plug Box for Despatching Systems

The illustrations, Figs. 6 and 7, show the jack box, which is commonly mounted on poles along the railway line, the outer case is made of cast iron, treated in the same manner as the instrument previously described, which effectively prevents rust and corrosion. The box is provided with a jack, in which the plug and cord are inserted; this is used in connection with the portable telephones,

FIG. 7

illustrated on pages 10 and 11. The tension of the springs are especially strong, to retain the plug in the proper position and insure perfect electrical contact. The mere insertion of the plug calls headquarters.

Central Energy Pocket Telephone

A Combination Pocket Set is here illustrated. We have in this assembly a complete set in condensed form, which is so constructed that it will withstand wear and hard usage. This type is specially adapted for the use of train men, and can be conveniently carried in the pocket and used in connection with the jack box, described on the previous page.

FIG. 8

Central Energy Portable Telephone

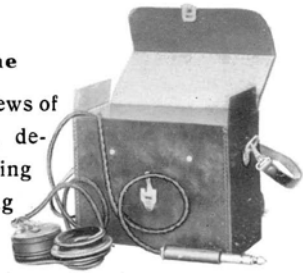

FIG. 9

Figs. 9 and 10 show views of our portable telephone, designed for systems using local battery for talking and common battery for signalling. The instrument is neat in design and attractive in appearance, being contained in a heavy leather case, hand sewed, and provided with an adjustable carrying strap. The lower part of the case contains two Pony Dry Batteries and a receptacle for holding the plug when not in use. The shelf shown in the open view is used to cover the batteries and also support the induction coil and pocket telephone. This is made of wood, both sides being covered with leather. When in place, it is supported at each end and fastened by screws. All connections which are in any way subject or liable to strain or any slight movement are soldered. The instrument is thoroughly well made and built to withstand the rough usage to which an instrument for this class of service is constantly subjected.

FIG. 10

Central Energy Office Type Telephone

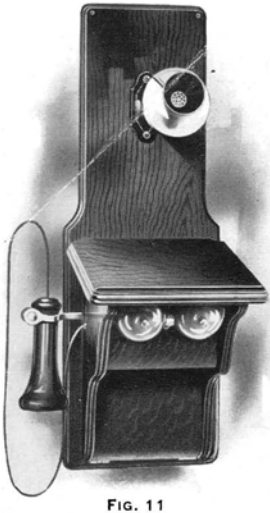

FIG. 11

The accompanying illustration shows our standard Central Energy instrument, which is intended for use in the superintendent's office, the various commercial offices and wherever they are required. The cabinet consists of only two parts. The backboard is provided with four dowel pins, one in each corner, to set the instrument out from the wall, thus eliminating all possible dampness. A large groove is provided in the center of the backboard for concealing the line wires extending to the instrument. It is so arranged that no fastening or screw connections are exposed. Each instrument is provided with our standard long distance transmitter and receiver, our standard platinum point hook-switch and induction coil. The woodwork can be furnished in golden oak or walnut, as desired.

FIG. 12

The Magneto System

The Magneto System as applied to the operation and despatching of railway trains, has many advantages, and is especially adapted for very long lines connecting various cities, and for interurban use. The apparatus is simple in design and durable in construction. Each instrument provides its own energy. A powerful hand generator for signalling, and two dry battery cells for talking. Instruments of this class are usually bridged to a metallic line which parallels the railway. The maintenance cost of such a system is exceedingly low and will be found indispensable when once put into use.

Magneto Despatching Telephone

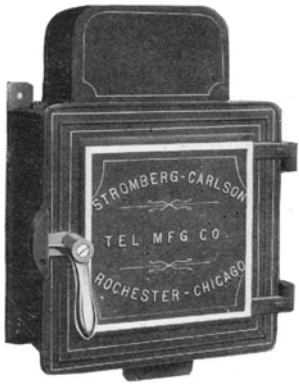

FIG. 13

The accompanying illustrations and the one on the following page show the closed and open views of our Magneto Railway Telephone. The case is built of heavy cast iron, and designed to meet the conditions of both bad weather and rough usage, and is absolutely water tight and weather proof. The outer door closes against a rubber gasket, preventing all dampness entering the instrument. The ringer is mounted in the dome on the top of the box with an opening at each side, so that a call may be heard at some distance from the telephone. The general arrangement of the apparatus and

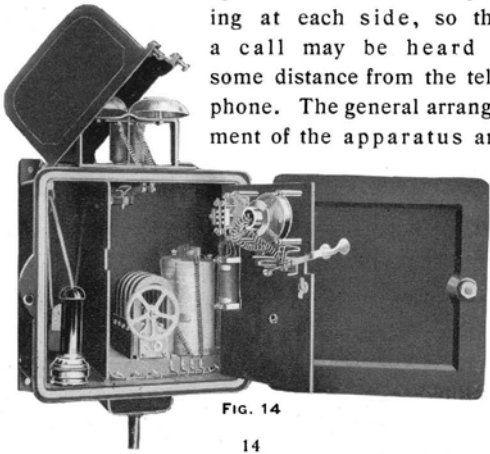

FIG. 14

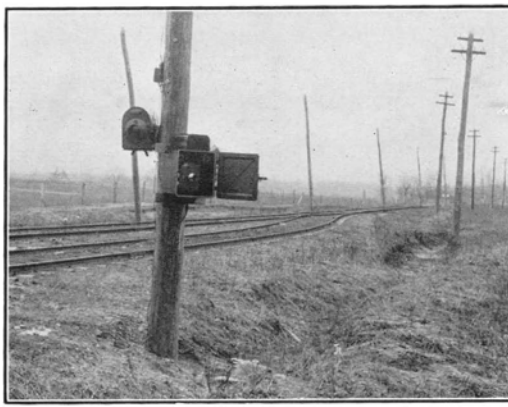

FIG. 15

method of treatment is similar to that described on page 8, of the Central Energy Instrument.

All wiring is done with the best grade of rubber insulated wire. The instrument is further equipped, as is our Central Energy apparatus, with our standard long distance transmitter and receiver, hook-switch and induction coil. This instrument is also provided with a powerful hand generator for signalling, and two dry battery cells which furnish the talking current. A gradual development in this class of apparatus has taken place, due to our experience in installing these systems under different conditions, great care and forethought having been spent in its construction, fully realizing the very severe conditions to which it is constantly exposed.

FIG. 16

Magneto Portable Telephone

Figs. 16 and 17, the instruments here shown, represent closed and open views of our standard Generator Call Portable Telephone or Test Set. The cabinet is made of quarter sawed oak, golden oak finish. It is strongly built and re-enforced with heavy brass corners. Each set is equipped

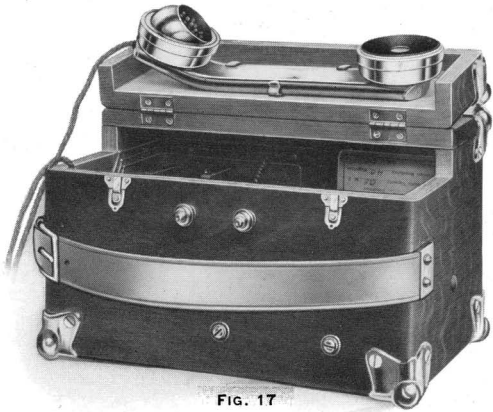

FIG. 17

with a hand telephone as illustrated, two cells of dry battery, a buzzer, and a four or five bar hand generator as specified. The case when closed is fastened by two catches. Each set has a carrying strap provided with buckles, so that a shoulder strap can be added if desired.

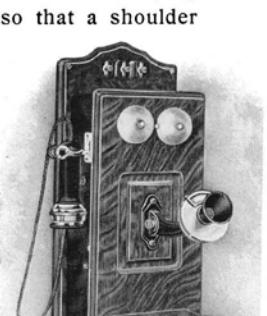

FIG. 18

Dry Battery Type Bridging Telephones

The accompanying illustrations, Figs. 18 and 19, show our standard Magneto Bridging Telephone, which is intended for use at the different stations, superintendent's office, etc., and is bridged usually to the metallic line used for the despatching system. It is also used oftentimes in booths located along the line. In this case it takes the place of the iron box instruments before described. Each instrument is likewise equipped with our standard apparatus and should be of the same resistance as the other instruments on the line.

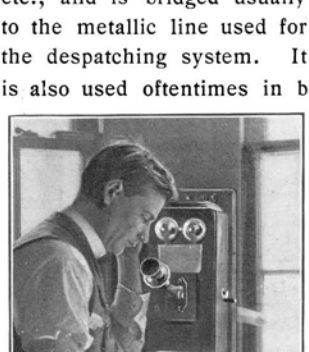

FIG. 19

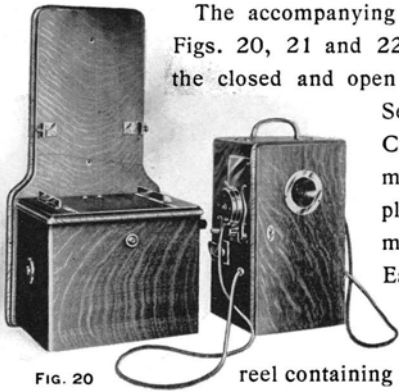

FIG. 20

The accompanying illustrations, Figs. 20, 21 and 22, show both the closed and open view of our Semi-Portable Car Instruments complete, ready for mounting. Each instrument is provided with a reel containing two hundred feet of flexible telephone cord, terminating in a plug. It is further provided with two Pony Dry Cells for talking, and a powerful four or five bar hand generator as specified, for signalling. The instrument is also equipped with our standard long distance transmitter and receiver. In the manufacture of this instrument, as well as all our product, special care and attention have been given to details. The design of the instrument is attractive in appearance, and all parts are made as heavy as possible, thus adapting it to the rough handling it is constantly subjected to. Fig. 22 shows the telephone instrument complete, mounted in the

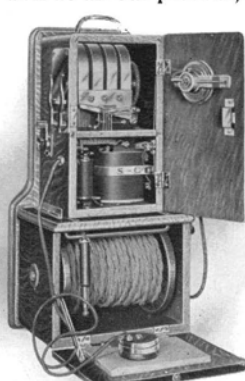

FIG. 21

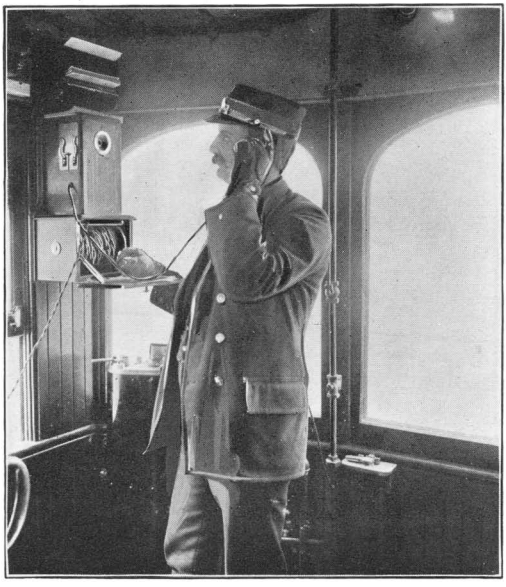

FIG. 22

vestibule of the car. Fig. 21 illustrates the open view, showing the general arrangement of apparatus, all of which is easy of access and readily repaired, and Fig. 20 shows the portable part or instrument proper removed, as is necessary, if it were to be used away from the car, or if an exchange of instruments were to be made.

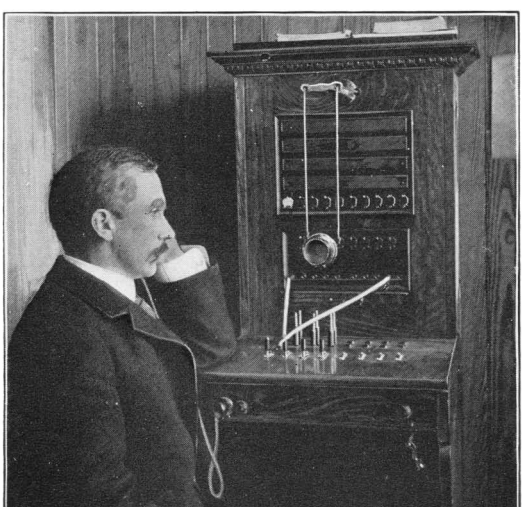

FIG. 23

General Office Switchboard

On this and on the following page are shown two of the most popular styles of standard switchboard cabinets, which have been found to be the most practical for use in Railway or Commercial work, and are more often used in the despatcher's office. We are prepared to build switchboards of any capacity and design to meet special requirements. These boards are specially constructed to give rapid and accurate service, special attention being given to obtain the best transmission with

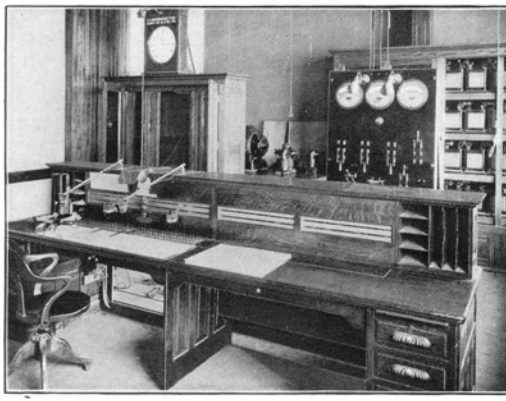

FIG. 24

Desk Type Despatcher's Switchboard

as few operating parts as are required. The telephone circuits are properly balanced so as to make it possible for the telephone lines to be erected in close proximity to high potential circuits, care being given to properly insulated and transposed line wires. A complete operator's equipment is furnished with each board, consisting of our standard long distance transmitter and receiver. The transmitter is hung by silk cords from an adjustable arm; the receiver with headband is attached by silk cord to a detachable plug, as shown in Fig. 12, page 13. Despatching boards are furnished for either Central Energy or Magneto Systems.

FIG. 25

Protection

Every telephone switchboard line equipment should be protected. Where the lines are exposed to lightning and sneak currents, this precaution is essential. It thus protects the switchboard apparatus from damage due to lightning and crossing of telephone lines with light and power wires. The accompanying illustration, Fig. 25, represents lightning arrester cabinet. Fig. 26 shows combination lightning and sneak current arrester; carbon blocks, with mica or silk separators, being used for protection against sneak currents. Fig. 27 shows a combination lightning and sneak current arrester of the perforated mica fuse type. This arrester is suitable for protection of switchboards of small capacity. The fuses consist of perforated micas provided with copper terminals, the fuse wire being soldered to these terminals and passing over the perforations of the mica. These fuses are mounted directly over a carbon-ground plate, which should be grounded. The fuse wire is separated from the

ground plate by the thickness of the mica. When lightning or high potential currents affect the wires so protected, it jumps across the perforation of the mica and blows the fuse. Sneak currents of a quarter ampere or more, on attempting to pass a fuse, blow the fuse, and consequently open up the switchboard or cable connections, thus protecting the same.

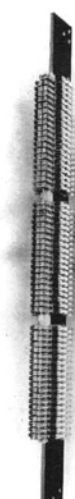

FIG. 26

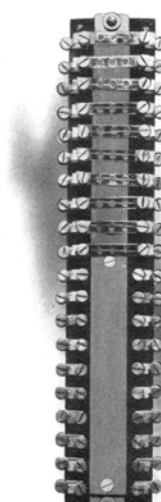

FIG. 27

In the operation of our despatching system in use along the lines of the Milwaukee Electric Railway and Light Co., the whole car system is operated from the company's head office building in Milwaukee, with a branch station at Racine, 23 miles south. In the telephone office, a commercial line board, previously shown, Fig. 23, and a despatching board, Fig. 24, likewise previously illustrated, are installed. All lines to the general office, power house, shops, residences of the officers of the company and other places where a telephone is desirable in the operation of the railway system, are terminated on the commercial line board. There are sixty-four commercial telephones in Milwaukee and nine at Racine. The despatching lines terminate on the despatching board and are so distributed as to parallel the railway system. One hundred and eleven despatching instruments are for the Milwaukee system and twelve for the branch system. These despatching instruments are placed at every crossing and junction of the city lines, at every turnout and junction of the interurban lines. The commercial board consists of two sections of the Central Energy Visual Signal type switchboard, having a capacity for one hundred lines each. The visuals, when not in operation, are concealed behind ground glass and appear in clear glass when operating. The jacks are mounted in strips of ten, numbered to correspond with the visual signals. There is also associated with the commercial board a line

pilot lamp which lights whenever a call comes in. The key board is wired for twelve pairs of connecting cords with double lamp supervisory signals, together with ringing and listening keys and a complete operator's telephone equipment. The operation of the commercial board is as follows: A call comes in from a party who has removed his receiver. The operator answers, and on learning the number of the desired party, uses the connecting cord, and plugs into the jack of the called party's line and rings. The lamp associated with the answering cord remains out, and the lamp associated with the calling cord remains lighted until the called party answers. If a call comes in on the despatching board for a party connected with the commercial board, the operator plugs into the jack, multipled with a despatching line mounted immediately below the corresponding calling lamp, and puts up the connection in the usual manner. The despatching board, as previously shown, is of the desk pattern and consists of two sections, each section having two operators' positions. The ultimate capacity of the despatching board is eighty lines. Each position is wired for twenty despatching lines, consisting of a visual signal and one ringing and listening key for each cord circuit, and a transfer key for transferring calls to the intermediate board. The keys associated with each line are mounted so that an operator answering a call need only press the listening key associated with the line calling.

The operation of the despatching board is as follows: A call is made by a motorman or conductor taking a receiver off the hook in the despatching box, which operates a visual signal on the board. The despatching operator pushes the listening key and puts himself in direct communication with the person calling. If the motorman or conductor desires connection with the power house, or any line terminating on the commercial board, the despatcher throws the transfer key, which lights the lamp on the intermediate board; thereupon the commercial operator takes the call and puts up the connection. The method of giving despatching orders is entirely verbal. The motorman in every case repeats everything back to the despatcher and does not leave until he repeats the despatcher's goodbye. A train sheet and a daily record sheet is kept by the despatcher.

Testimonial Letters

Chicago & Milwaukee Electric Railroad Co.

Office of Superintendent.

Highwood, Ill., June 13, 1906

Stromberg-Carlson Telephone Mfg. Co.
Rochester, N. Y.

Gentlemen—Replying to your letter of the 8th inst., regarding the use of a telephone system for our train service, our despatching system consists of a private telephone line along our entire route with telephone booths at frequent intervals. I am pleased to say that we consider the telephone essential to the maintenance of our schedule and successful operation.

Yours very truly,

(Signed) E. L. DesJardins,
Superintendent.

Joliet, Plainfield & Aurora Railroad.

Joliet, Ill., May 6, 1905

Stromberg-Carlson Telephone Mfg. Co.
Rochester, N. Y.

Gentlemen—In reply to your inquiry in regard to the success we are having with your special car telephones, we beg to say that they are meeting our requirements to our perfect satisfaction. We have all of our cars equipped with these 'phones, and jack boxes placed at each end of each turnout, at railroad crossings and at half-mile intervals between these points. The BEST evidence that we are satisfied with your 'phones is shown by our recent order for two additional 'phones for new cars, and we would request you to push this order forward with all possible speed.

Wishing you success in introducing these telephones to other electric lines, we beg to remain,

Yours very truly,

(Signed) L. D. Fisher,
Treasurer.

Louisville & Southern Indiana Traction Company.

New Albany, Ind., June 22, 1906

Stromberg-Carlson Telephone Mfg. Co.
Rochester, N. Y.

Dear Sirs—Replying to your favor of June 8th, I beg to say that we have been using the telephone system to despatch our cars for the last three years. Up until about two months ago we had leased the bell telephones, but the service was so bad by the non-maintenance of same that we installed our own phones of your manufacture. I will say that we are very highly pleased with same. I can hardly see how an Interurban Line could be run satisfactorily without the aid of a telephone system.

Yours very truly,

(Signed) F. E. Cole,
Superintendent.

Interurban Railway Company.

Office of the President
and General Manager.

Des Moines, Iowa.

Stromberg-Carlson Telephone Company.
Rochester, N. Y.

Gentlemen—In reply to your letter of June 8th, as to what success we are having with our telephone system in the operation of our lines, will say that it has proved very successful and a very efficient means of despatching trains. Our despatchers issue the orders over the telephone to the conductors who call him up at the various telephone booths. In these booths are placed one of your telephones, together with a pad of train order sheets.

The conductor reads the train order verbatim as given him by the despatcher. When it is written, he completes it by reading it back to the despatcher. He then takes one copy to his motorman, and the motorman reads it to the conductor.

These orders are made in triplicate, one for the motorman, one for the conductor and one for the lock box in the booth.

We have had no difficulty with this system at all.

Yours very truly,

(Signed) H. H. Polk,
Pres. & Gen. Mgr.

Rochester & Eastern Rp. Ry. Co.

April 24, 1905

Stromberg-Carlson Tel. Mfg. Co.

Rochester, N. Y.

Gentlemen—Having used your telephones and appliances on on our Despatching System during the past year, it may be of interest to you to know of the success with which we have met.

Our cars are equipped with your Semi-Portable Telephones and Reels, and each car carries a Connecting Pole for emergency, to be used when a car is detained between jack boxes, which are placed at points where cars are to receive orders or to report.

We have had experience with other systems, and are pleased to find that you have overcome a great many of the objections that railroad people have had to the car telephone.

The transmitters, contrary to the general belief of railroad men, are not to any extent "knocked out by the running of the cars." During the busy season last year and the deep snows of the past winter, it would have been impossible to have maintained anything like schedule time, if it had not been for the excellence of your telephones.

Your connecting pole is the best one we have seen, both electrically and mechanically, and the only one that rain, sleet or snow does not effect.

Yours very truly,

(Signed) J. H. Pardee,

General Manager.

A Few of Our Customers

Danville Ry. & Lt. Co. ..... Danville, Ill.
Chicago & Milwaukee Elec. Ry. Co. ..... Highwood, Ill.
Aurora, Elgin & Chicago Ry. ..... Wheaton, Ill.
Chicago Union Traction Co. ..... Chicago, Ill.
Northwestern Elevated Ry. Co. ..... Chicago, Ill.
Metropolitan West Side Elev. Ry. Co. ..... Chicago, Ill.
Lake St. Elec. Ry. Co ..... Chicago, Ill.
Louisville & Southern Ind. Traction Co. ..... New Albany, Ind.
Iowa & Illinois Railway Co. ..... Clinton, Ia.
Interurban Railway Co. ..... Des Moines, Ia.
Louisville Eastern Ry. ..... Louisville, Ky.
Ky. & Ind. Bridge Ry. Co. ..... Louisville, Ky.
Detroit United Ry. Co. ..... Detroit, Mich.
Detroit & Mackinac Ry. Co. ..... Detroit, Mich.
Saginaw Valley Traction Co. ..... Saginaw, Mich.
Detroit, Monroe & Toledo Short Line Ry. ..... Monroe, Mich.
St. Francis Co. Elec. Ry. Co. ..... Farmington, Mo.
Interurban Ry. Co. ..... Cincinnati, Ohio
Columbus, Delaware & Marion Electric Co. ..... Columbus, Ohio
Scioto Valley Traction Co. ..... Columbus, Ohio
Sandwich, Windsor & Amherstburg Ry. Co., Windsor, Ont., Can.
Conneaut & Erie Traction Co. ..... Girard, Pa.
Trenton & New Brunswick R. R. Co. ..... Philadelphia, Pa.
Pittsburg, McKeesport & Connellsville Ry. Co. ... Pittsburg, Pa.
Utah Light & Ry. Co. ..... Salt Lake City, Utah
Milwaukee Elec. Ry. & Light Co. ..... Milwaukee, Wis.
Birmingham & Atlantic Ry. ..... Talladega, Ala.
Southern Pacific Ry. ..... San Francisco, Cal.
Chicago & Western Ind. Ry. ..... Chicago, Ill.
A. T. & S. Fe. Ry. System ..... Chicago, Ill.
C. & N. W. Ry. Co. ..... Chicago, Ill.
Louisville & Nashville R. R. Co. ..... Campbellsville, Ky.
Houston Tex. Cent. Ry. Co. ..... New Orleans, La.
Chicago, Kalamazoo & Saginaw Ry. ..... Kalamazoo, Mich.
Pere Marquette Ry. Co. ..... Saginaw, Mich.
Great Northern Ry. Line ..... St. Paul, Minn.
Union Pacific Ry. ..... Omaha, Neb.
Newton Street Ry. Co. ..... Newtonville, Mass.
Portsmouth, Dover & York St. Ry. Co. ..... Portsmouth, N. H.
Baltimore & Ohio Ry. Co. ..... Cincinnati, Ohio
Rochester, Syracuse & Eastern Electric Ry. Co., Newark, N. Y.
Rochester & Sodus Bay Ry. Co. ..... Rochester, N. Y.

CORDAY & GROSS, PRINTERS, CLEVELAND