

### C. P. R. Telegraph Signs.

After a thorough trial, Manager Hosmer, of the C. P. R. Telegraphs, has decided to abandon the use of painted wooden signs for his offices, and to substitute enamelled iron, which is now being adopted everywhere as the most serviceable & up-to-date outdoor sign. As new offices are opened they will be supplied with the new standard signs & the old offices will be equipped with the new signs as fast as the old ones need replacing. The new standard sign is very effectively designed, having a miniature map of the territory covered by the Co.'s lines in the centre. The single ones go flat against a building; the double ones with flange project at right angles to a building, & either will attract attention where an ordinary painted sign would be hardly noticed. They were supplied by the Acton Burrows Co., Toronto, who are the sole agents for Canada for the largest English manufacturers. As is well-known, the only satisfactory enamelled iron signs are all made in England, the experiments made in various places in America having so far failed to produce an article at all approaching them in quality.

### Telegraph Office Changes.

#### GREAT NORTH-WESTERN.

OPENED.—Ahmic Harbor, Muskoka Wharf, Tobermory, Port Ryerse, all in Ontario.

CLOSED.—St. Placide, Que.

### Telegraph Ticks.

A cable steamer is being built in England capable of carrying 6,000 tons of cable. This is twice the capacity of the present largest cable steamer.

Wm. Christie, Victoria, B.C., Manager of the C. P. R. Telegraph, was married recently to Annie Sinclair, daughter of D. Holmes, of Springville, Pictou County, N. S.

Application is to be made, under the Quebec Joint Stock Co.'s Act, for the incorporation of the Soulanges Electric Co., with headquarters at Coteau Landing, & a capital of \$10,000, to produce electricity, & construct & operate telegraph & telephone lines in the County of Soulanges.

The C. P. R. has constructed a telegraph line between Niagara on-the-Lake & Niagara Falls by way of Queenston, from which place to Niagara Falls the wire is strung on the poles of the Niagara Falls Park & River Ry. The Co.'s other new work on the Ontario division this year includes an additional railway wire between Smith's Falls & Toronto, & another wire from Toronto to Hamilton via Schaw.

The Postal Telegraph Co., operating the wires along the lines of the Chicago Great Western, is putting in 7 dynamos at Oelwein, Ia., to furnish electric current for all its telegraph lines centering at that point. About 600 cells of battery will be displaced. A 220-volt dynamo will be run by a direct-connected engine, & there will be 6 other dynamos. It is expected the cost of maintenance will be only about  $\frac{1}{4}$  that of the batteries hitherto used.

A Vancouver telegram of May 8 says: "Mark Eschwege, of Vancouver, representing a syndicate of French millionaires, the Anglo-French Telegraph Co., with a capitalization of \$500,000, received a cable to-day to commence the survey at once for a cable from Vancouver to Dyce, Skagway & Wrangel. Eschwege left for Dawson to-day. Offices will be at Vancouver, Victoria, Dyce, Skagway, Wrangel & Dawson. The cable is now being manufactured in Europe." The Co. referred to has given notice of application to

Parliament for the necessary powers to construct a line by means of cable & land line from Vancouver to Dawson City, with extensions.

A bill has been introduced in the Hawaiian Legislature, authorizing the construction by the Pacific Cable Co. of a cable between the U.S. & the Islands. This Co., better known as the Scrymser Co., has obtained a favorable report from a congressional committee at Washington on a bill to enable it to lay the cable. The Hawaiian bill gives the Co. exclusive cable rights for 20 years. The cable must be laid within 18 months after the passage of the act by the U.S. Congress, & extended to Japan within 3 years. It must be capable of transmitting 15 words a minute, & the toll rate between Honolulu & San Francisco is not to exceed 35 c. a word, & to Japan it is not to exceed 90 c. a word.

### TELEPHONES.

#### Long Distance Telephony in Canada.

Rapid as has been the development in the application of electricity to the requirements of social & commercial life, in no direction has it been more surprising than in the science of telephony, & more especially in the extension of its capabilities for long distance communication. It is doubtful if the achievements of the long distance telephone are as yet fully appreciated by many who are well versed in the triumphs of other branches of electrical science, much less to the general public. Comparatively few people in Canada realize that to-day it is perfectly feasible to converse satisfactorily by long distance telephone, say, from Toronto to Portland; Montreal to Pittsburgh or Chicago; Hamilton to Baltimore; or Ottawa to Washington. Yet it can be, and is being done. Leaving aside altogether the enormous & constant application of inventive skill & capital which have been required to bring the local telephone service to its present efficiency, it is certain that the changes & the development of the long distance branch of the service have been equally radical & proportionately expensive.

The first attempt of the Bell Telephone Co. of Canada to establish a long distance service was made in 1881, by the construction of a single iron wire line between Toronto & Hamilton, then considered quite an achievement, & the line was well patronized. Within 3 years, 855 miles of poles & 1,500 miles of wire were constructed by the Co., but so rapidly did conditions change, that even in this short time this type of line was found inadequate to the requirements of a growing business.

In 1885 copper wire was substituted for iron wire, affording better results. The introduction of the electric light & trolley, however, soon forced upon the Co. another & a more radical change, & metallic circuits had to be adopted upon all principal lines. This change, begun in 1885, was carried on as fast as circumstances would allow until all the principal lines of the Co. were made metallic, or, in other words, 2 wires were necessary to transmit a satisfactory conversation where 1 would suffice before the introduction of electric cars.

The extension of the system, in the meantime, went on apace, until, at the end of 10 years, the Co. had in operation 4,484 miles of pole line & 13,148 miles of wire in its long distance service, & at the present time they have in Ontario & Quebec 6,095 miles of poles, bearing 16,567 miles of wire.

Connections have been established with the extensive long distance system of the American Telegraph & Telephone Co. & affiliated companies in the U.S., at Newport, Vermont, St. Albans, Ogdensburg, Buffalo & Detroit, affording a system of direct telephonic com-

munication as far south as Virginia & Tennessee, & from the cities & towns of the Atlantic seaboard westward to Nebraska.

The difference in the cost of the first long distance line of 1881 & the long distance line of to-day affords one of the serious problems in finance which the Co. has to meet. It is not a mere matter of change; it is a revolution requiring absolutely new & far more expensive construction. In 1881 a No. 9 iron wire (288 lbs. to the mile) was the best in use. To-day most of the construction is of 2 copper wires (which together weigh 532 lbs. to the mile). Formerly 32 poles to the mile were sufficient, but with the introduction of copper, in order to reduce the strain upon the wire, 40 poles to the mile are used; the poles have to be set deeper in the ground & more carefully stayed, all of which greatly increases the cost.

The long distance central office equipment of to-day is much more expensive than it was 10 years ago, improvements having been made to facilitate the work of operating & to secure the best results in communications. The astonishing results which the long distance telephone service of to-day affords is due as much to the improvement in instruments, switches & other apparatus, & to the system upon which these are employed, as it is to the improvement in the lines.

Many people suppose the long distance telephone is a competitor of the telegraph, & are unable to understand the cause of the difference in rates. The competition is largely, if not entirely, mythical, & the reason for difference in rates is easily explained. The telegraph employs a single iron wire conductor, & by means of a quadruplex instrument, this single wire is made to serve the purpose of four wires. The long distance telephone service requires 2 copper wires for each circuit, which together weigh nearly double what the single iron wire does, & costs over 5 times as much per pound. The general construction & office equipment of the long distance telephone service is also far more expensive than that of the telegraph. Nor does the comparison end here. An ordinary 10-word telegram may be transmitted in a minute, & it is practicable to transmit 4 messages simultaneously over 1 wire. Each completed conversation over the long distance telephone occupies 2 wires for an average of 10 minutes; the comparison, therefore, being 2 copper wires for 10 minutes, as against  $\frac{1}{4}$  of a single wire 1 minute.

Another important difference arises from the essential difference in the 2 systems of communication. The sender of a telegram writes out his message & goes about his business, & the operator forwards it as other demands on the line will best admit, with slight reference to time, thus keeping the telegraph lines fully employed at all hours.

The correspondent by telephone must have the line when he requires it, or not at all, & practically the entire earnings of the long distance telephone line must be within such hours as business men generally are in their offices, the hours during which these lines are productive being thus limited; & as has already been pointed out, the capacity of the long distance line being confined to an average of 6 conversations an hour, it is clear that the rate must be sufficient to yield during that time an adequate return upon the investment & expenses.

Telephone rates are based on mileage and the time the line is occupied. The parties to a conversation absolutely control the line for the whole distance between them, on the average, 10 minutes (5 minutes for the conversation & 5 minutes to arrange the connection & to disconnect the line). It follows that in equity they must pay for the investment they control for the time it is at their disposal. Therefore, distance & time must be the ruling factors in fixing the rates.