

ed that the company was in no way obstructing the matter of placing wires under ground, as alleged. The company was prepared to enter into a nagreement with the city in the matter some time ago, and a draft agreement was prepared, but the company was unable to execute it as it had granted certain privileges to the Ottawa Electric Co. If the city and the Electric Co. can come to an arrangement, releasing the G.N.W.T. Co. from its obligation, the company is prepared to commence the underground work at once.

### Hints on Telegraph Matters.

By W. J. Camp, Assistant Manager, C.P.R. Telegraphs.

Following are extracts from a paper read at a meeting of the Association of Railway Telegraph Superintendents:—

#### INSULATORS.

During the period from 1887 to about 1898, the C.P.R. used white porcelain insulators on a portion of the long through wires. These were of German or British manufacture. An elaborate series of tests proved their great superiority over glass from a mechanical standpoint, the average blow necessary to break a porcelain being three times that required to break the glass insulator. It was also discovered that usually a porcelain insulator was only partially destroyed when hit by a stone, and that the wire was not set free and remained fastened to each pole, but the glass insulator was so badly shattered that the wire would be freed, and this frequently resulted in a cross with other wires which remained attached to the pole. This advantage was offset to some extent by the fact that, on account of the porcelain insulator being white, it offered a much better mark and was the one aimed at. The price of the porcelain insulator was increased until it reached about nine cents each laid down in Montreal, and its use by us, therefore, abandoned for some years. The glass insulator with which we were supplied then depreciated in quality, apparently on account of improper annealing, and appeals or complaints to the manufacturers resulted in no improvement; and, as the cost of the porcelain insulator was again very largely reduced, we have purchased nothing but white porcelain for the past three years.

In 1910 we procured porcelain insulators from Canada, the United States, and Germany. One make turned out to have defective insulation properties, and we had a series of tests made comparing the three manufactures and glass. All of the insulators were of the same pattern and dimensions. One dozen insulators of each make, selected at random, were placed on pins in the open air, and frequent readings taken of insulation, humidity, temperature and barometer. During the tests the weather was of nearly every description, from dry cold to sleet, wet snow and rain. These tests proved that in every respect the German and United States insulators had from 5 to 10 times the insulating qualities of the Canadian and glass insulators, the two former giving practically the same results with a slight difference in favor of the German, and the Canadian porcelain and glass almost on a par. Tests of wires after erection show the same differences.

#### TRANSPOSITIONS.

The first telephone dispatching circuit we installed was transposed every half mile. The selectors were in series, alternating on each wire. The circuit was found to be slightly noisy, and we then transposed it every quarter mile, which cut down the noise for a time, but we found it almost impossible to keep the circuit free from noise while working the selectors in series; and, as we found that most of the failures were due to the contact points of the relay, we

changed from series to main line bridging selector without relay. Since then the circuit has been practically free from noise, and on all subsequent circuits installed the same method has been followed. We now transpose all our dispatching circuits every quarter mile, except where two circuits parallel each for a portion of the way. Over this section one circuit is transposed every quarter mile, and the other every half mile. Looking forward to the time when the telephone will be used for other work, we arrange transpositions on our copper telegraph wires (and sometimes on the iron), every half mile for the first pair, and for the second pair, every mile, or transposed at the quarter, three-quarter, and mile, skipping the half mile.

Our method for transposing when the two wires are on the same arm, is by the use of a curved iron bracket under the arm, and so placed that the wire it carries comes directly under the wooden pin carrying the other wire over the top of the arm. This bracket is specially made for us, but the arrangement is similar to that of the Harvard Co. Where the two wires are on separate arms we place an extra pin on the upper arm half way between two of the regular pins, and skip the pin on the lower arm. By these methods we have largely decreased the liability of crosses in case of broken insulators.

#### LIGHTNING PROTECTION.

The problem of adequate lightning protection is a most serious one with the C.P.R. on the portion of the line between Lake Superior and the Rocky Mountains on account of the excessive severity of the lightning in this district. I might say that we are between the devil and the deep blue sea. If we use sufficient arresters to take care of the frightful discharges, we most likely will kill the telephone circuit by having so many "traps for bugs." We have been using in the stations where the fone line is looped, four Argus arresters, without fuses, on the four ends of the wires, and two Argus arresters with fuses on the bridge wires to the fones and selector. At stations where the circuit is only legged in we have two Argus arresters, with fuses. At the dispatchers office, besides the Argus arresters, we equipped the first three poles from the office with O'Connell pole arresters. In some sections this protection seems to be adequate, the circuit being worked right through storms, but in the district above mentioned it does not appear to be sufficient, my reports showing that at times the telephone has to be abandoned for an hour or more on account of lightning. There have been some interruptions on account of the pole arresters, and this year we are trying out the branch office and pole arresters to the same extent as the former equipment. Some of our superintendents have asked for pole arresters at every station, but I am afraid that if such were installed they would prove to be an endless source of trouble and annoyance, and that after every severe lightning storm, the circuit would be out of commission until a lineman could be sent over it.

#### TELEPHONE INSPECTORS.

On the C.P.R. we have one telephone inspector for 250 to 300 miles of circuit, with his headquarters approximately in the centre. Up to the present we have not found it necessary to provide the inspectors with motor cars, but, personally, I believe that every inspector should have a light motor car, particularly in sections where there are comparatively few trains. Our inspectors are supposed to be continually on the move. I consider that an inspector's duty is not so much to remove interruptions, as to prevent them occurring.

#### TRAIN TELEPHONE SETS.

On every section where we install tele-

phone train dispatching circuits we equip every train with a telephone outfit, without selectors. The wrecking cars are provided with howler receivers, by means of which the dispatcher can call them in on the line if necessary. The connecting pole we use is the invention of J. F. Richardson, Superintendent of Telegraphs, C.P.R. British Columbia Division. It is so arranged that connection can be made with any two wires on the line, no matter whether they are on the same arm or not. We do not install any equipment at outlying sidings, as the train equipment answers every purpose should a train become stalled anywhere. On account of the severity of our climate during a portion of the year, no one could use a telephone at a pole box, and each outfit contains sufficient flexible twin wire to lead the circuit into the baggage car or conductor's caboose.

### Trade and Supply Notes.

The matter which appears under this heading is compiled, in most cases, from information supplied by the manufacturers of, or dealers in, the articles referred to, and in publishing the same we accept no responsibility. At the same time, we wish our readers to distinctly understand that we are not paid for the publication of any of this matter, and that we will not consider any proposition to insert reading matter in our columns for pay or its equivalent. Advertising contracts will not be taken with any condition that accepting them will oblige us to publish reading notices. In other words, our reading columns are not for sale, either to advertisers or others.

The Ohio Brass Co., Mansfield, Ohio, has distributed its new general catalogue 12, which contains a listing of all the company's lines, including catenary materials, 1,500 volt materials, 750 volt overhead material, rail bonds, third rail insulators, O-B high tension insulators and car equipment specialties. The catalogue is bound in cloth and contains 490 pages, which include, besides the listing of the different devices, considerable data relative to construction schemes.

The Canadian Westinghouse Co. has secured a contract from the Shawinigan Water and Power Co., Shawinigan Falls, Que., for one 15,000 k.w. 2 bearing water wheel type, 60 cycle generator, which is said to be the largest water wheel generator to be installed in Canada. This will be the third unit which the Westinghouse Co. will have furnished from its Hamilton shops for the Shawinigan Co.'s new power house, the other two units being of slightly smaller capacity, viz., 14,000 k.w.

J. J. Gartshore, Toronto, who some time ago purchased the rails, etc., of the Opeongo Logging Ry., a line of 14 miles running north from Whitney, Ont., to Lake Opeongo, has disposed of all the rails, etc., except of about three miles, and the whole of the material has been lifted. The rails, which are principally 56 lbs. per yard, have seen considerable service, but are still in good condition. Mr. Gartshore advises that the demand for light rails and contractors' equipment generally has been very active during the past few months, owing to the large railway contracts which have been given out.

"The Use of Highly Superheated Steam in Locomotive Practice," an illustrated 28 page booklet, has recently been distributed by the Locomotive Superheater Co., 30 Church St., New York. In it, the development and present day practice in the use of highly superheated steam are outlined, the valuable feature of the booklet lying in the fact that the information contained is for the most part data obtained from outside sources, and consequently, does not savour strongly of the standard type of catalogue. The different types of superheaters made by the company are described in their application to all types of locomotives, incidentally devoting some space to the matter of applying superheaters to existing locomotives.