

## REPORT.

The CHIEF ELECTRICIAN to the SECRETARY, General Post Office, Wellington.

SIR,—

Wellington, 4th May, 1912.

In accordance with your instructions to me to proceed to the United States, Great Britain, and the Continent of Europe to inquire into matters relating to telephones (both manual and automatic), to systems of telegraphy, and to wireless telegraphy, departure was made by the s.s. "Maitai" from Auckland for the United States on the 11th March, 1911. San Francisco was reached on the 31st March after an uneventful voyage.

Some time was spent in San Francisco investigating the various subjects. As is well known, the severe earthquake which occurred in that city a few years ago was immediately followed by a great fire which raged over an area of some square miles of the city; and in common with everything else the telephone systems suffered severely, necessitating their being rebuilt. As the rebuilding was so recent, opportunity was afforded for advantage to be taken for the introduction in the case of the manual exchanges of the most recent developments so far as these were considered to be applicable to the present and prospective requirements; and San Francisco has to-day types of manual equipment and methods of operating in its telephone exchanges that are of a high order and worthy of study. Automatic telephones have also been introduced into the city.

It will be convenient to refer to the subjects that are being dealt with in the following order:—

- (1.) Automatic and semi-automatic telephony;
- (2.) Manual telephony;
- (3.) General telegraphy;
- (4.) Wireless telegraphy.

### AUTOMATIC AND SEMI-AUTOMATIC TELEPHONY.

Automatic exchange working has attracted inventors for probably a quarter of a century, and from time to time different kinds of apparatus have been evolved.

Designers of full-automatic and semi-automatic systems all aim to reduce the working-costs of telephone service by introducing mechanisms that will enable the force of operators at the exchange to be either wholly or partially dispensed with, and that can be placed if needed at various points in a telephone area, thereby reducing the first cost and the maintenance cost of the plant, such as conduit, underground, and overhead cables.

The designers of full-automatic systems claim that there can be and have been produced systems the mechanism of which is so reliable as to give satisfactory service. The operator is dispensed with, and it is possible for any subscriber in any one of several exchanges in a given extended area to effect for himself telephonic connection with any other subscriber in any of the exchanges in the area.

The designers of semi-automatic systems contend that, considering the state of the telephonic art as developed along manual lines, it is not desirable that subscribers should be called upon to do their own operating. They claim that subscribers have become so accustomed to have access to an operator to effect connection for them and to whom to refer when anything appears to go wrong with a connection that it is not judicious in the interests of good service and of having a satisfied user to require the subscriber to do his own operating. The designers have every faith in mechanism properly constructed and cared for being entirely satisfactory to automatically effect the different combinations necessary to complete a connection, but they give the subscriber access to an operator who sets the automatic mechanism in operation.

The differences between these systems will become apparent as they are being described.

The extent to which automatic exchanges have come into use in America, and the rapid strides that have been made with them in that country during the last two or three years, have attracted the notice of telephone engineers generally. So much is this the case that certain of the Canadian Provincial Governments, the German and the Bavarian Administrations have adopted the full-automatic system on a considerable scale, while the British Post Office is erecting two or three small installations, and purposes one or two large installations quite shortly. The Commonwealth also is erecting an installation of full Strowger automatics at Geelong in Victoria.

Several manufacturing companies in the United States were seen to be engaged either in introducing into actual service or in developing full-automatic or semi-automatic equipment.

In addition to the Strowger full-automatic system manufactured by the Automatic Electric Company, Chicago, which system has been in operation for many years, and which, by reason of its merits and more extensive use in recent years, has brought automatic telephony into the prominence that it now commands, it was found that the following companies had systems either developed or in course of development: (1) The Western Electric Company, New York; (2) the North Electric Company, Cleveland; (3) the Stromberg-Carlson Company, Rochester; (4) the Keellogg Telephone Company, Chicago.

In Europe the Siemens-Halske Company, which has obtained the right to use in Germany the Strowger patents of the Automatic Electric Company, is actively engaged in the manufacture and supply of considerable quantities of equipment to the German and Bavarian Administrations. The Thompson-Houston Company in France has obtained the right to use the same patent in that country, and is engaged in the work of supply, but not to any considerable extent.