

The general policy, therefore, is Government ownership of telephones, the same as in England and British colonies.

#### BRANCHING MULTIPLE SWITCHBOARDS.

*Satisfactory Service.*—The branching multiple system, which in many places is being supplanted by the central-battery switchboard, is a good system, and is in use in several of the larger exchanges in New Zealand. When metallic circuits are provided with it a very satisfactory service can be given.

*Some Disadvantages.*—There are, however, the disadvantages that the subscriber requires to ring up the exchange and that a local battery for speech is used at the subscriber's end, and this battery may not always be thoroughly efficient.

#### CENTRAL-BATTERY SYSTEM.

As the central-battery system has been so often referred to, and is the standard that is being almost universally adopted, a brief description of its principal features may be of interest.

Metallic circuits are required for satisfactory working.

There is no ringing-up by the subscriber necessary. The action of taking the telephone off the hook lights a small lamp at the exchange, which is the signal there that attention is wanted.

Current for speaking at the subscriber's end is conveyed along the subscriber's wire from the exchange, where there is a battery of accumulators that can be maintained always in a state of high efficiency. These are advantages to the subscriber.

At the exchange the operator has much greater control over the connections than can be obtained under other systems.

On the keyboard in the exchange there is a small lamp associated with each cord. When a subscriber has called and has asked for another subscriber, the keyboard-lamp of the calling subscriber is darkened; his receiver being off the hook, the operator plugs into the jack of the called subscriber, and rings. The keyboard-lamp, associated with the cord used to call with, lights up and remains alight until the call is answered, which is notified to the operator by the darkening of the lamp. As long as this lamp remains alight the operator can see that the connection is incomplete, and she rings again. If after ringing several times the connection is still incomplete, as indicated by the lamp remaining alight, the plug is withdrawn from the called subscriber's jack and inserted into another jack from which "tone" signals are conveyed to the calling subscriber, signifying that the called subscriber "Does not answer." There are other "tone" signals signifying "Busy."

Subscribers soon get to know the meaning of these tone signals, and the need of conversation between operators and subscribers is reduced to a minimum.

When the conversation between two subscribers is finished each subscriber merely restores his telephone to the hook, and the keyboard-lamp of each connecting-cord glows in the exchange, which is the disconnecting signal. When only one keyboard-lamp glows the operator does not disconnect, as one of the subscribers may have placed his telephone on the hook to seek information being asked for. If either subscriber wishes to call the attention of the operator, this can be done by moving the receiver switch, thereby flashing the keyboard-lamp at the exchange; upon seeing such the operator pulls in and listens.

These are the leading features of the system as they affect the public. The advantages at the exchange are that faults disclose themselves automatically, and a high state of efficiency can be maintained.

### UNITED STATES OF AMERICA.

#### BELL TELEPHONE SYSTEMS.

*Immense Development since Monopoly expired.*—Until 1893 the Bell Telephone Company had a monopoly of telephones, which was very unsatisfactory. Since that date, when the Bell patents expired, there has been an immense development.

Without going too much into detail, the growth and magnitude of the business may be indicated by stating that in 1892 the number of telephones in the Bell system was about 220,000. Now there are between two and three millions, and the capital invested about £70,000,000 sterling.

Mileage of wire in January, 1905, was—overhead, 4,671,038 miles; underground, 1,888,760 miles.

#### THE "INDEPENDENT" TELEPHONE SYSTEMS.

Besides the Bell system there were no less than 4,107 "independent" telephone systems, commercial and mutual, in operation, with a capital investment of about £40,000,000 sterling, and using 2,000,000 telephones in connection with 6,608 exchanges. The success of the independent companies is, to some extent, due to the cheaper rates which they offered, but it is considered to be more due, however, to the enormous demand for telephone communication, which could not be met by the existing organizations. It is impossible for the Bell companies to provide for the whole of the development required by the rapid commercial, industrial, and agricultural pursuits of the country.

*Every Class of Service represented.*—In the United States telephone system are to be found the largest and most perfectly equipped and organized exchanges in the world, as well as telephones worked on the roughest rural lines, often fencing-wire. The details for cities of millions or hundreds of thousands of people are different from details of equipment for cities with less than 100,000.