

platform just as cords in a telephone-switchboard are. A little above the platform there are heavy brass curved pieces with strong springs. By inserting an instrument-wedge under one of these springs any instrument can be connected to any line. Some lines have two springs, so that two sets of instruments can be placed in series in the circuit if desired. Way-lines are provided from one part of the test-board to another to facilitate connections.

There is a wire-chief to every fifty lines on the test-board. This man sits before his allotted portion of the test-board, and with a set of instruments provided near him can cut in on any line and attend to trouble. One board that was carrying the local lines had equipment for about three hundred lines, where only one wire-chief was attending to all, as these circuits are less liable to trouble than cross-country lines.

The administration aims not to exceed ten minutes' delay, and 80 per cent. of the work is done with five minutes' delay. It telephones large numbers of messages, up to twelve thousand a day, so as to obviate delay, and as far as possible desires not to deliver the telegram if it has been accepted by telephone. There are over twenty girls engaged on that work in a special room.

In telegraphing to the Atlantic coast cities there is usually one repeater in circuit; to the Pacific coast two or three repeaters are employed. San Francisco works to New York through six repeaters, but the speed is not higher than twenty words a minute.

On one duplex circuit from Montana to Chicago, two thousand miles long, it was noticed the signals were slower and more deliberate than on the shorter circuits. The sender at Montana was using a machine key. Many of the men working on the fastest circuits use these keys. They seemed to be making no effort, and the men receiving and using typewriters also seemed to find no effort in keeping up with the fastest sending. The operators seldom break. The use of typewriters may be said to be universal.

Adjusting of instruments did not seem to be often necessary, which was accounted for, no doubt, by the general dry and hot weather prevailing at that time.

Noting the speed at which the operators work on the principal circuits, the conclusion arrived at was that in New Zealand we have numbers of operators who are quite capable of doing equal work. The average length of messages was stated to be about thirty words, including the preamble. This figure was also given in other cities. Operators send and receive fifty-five to seventy messages an hour on the fastest wires, and this applies to a few of the medium-distance quad. circuits. On long quad. circuits the speed reduces considerably. The B side is often shaky. Numbers of quad. circuits are ruined by high-power circuits running in their neighbourhood. One man looking after quad. circuits has a device by which he has rendered useful many lines that were useless, and he hopes still to improve it. It is kept secret, and no information could be obtained about it. On quadruplex tables the A sender and receiver occupy one side, the B sender and receiver the other side. Each receiver had a key as well as the sender, so that he may when breaking do his own sending. When he has to break he marks "bk," and the sender hears his sending on the pole-changer or transmitter broken, and stops at once. There are no acknowledgments of messages. These messages are passed away for distribution as soon as finished, to avoid delays.

Every circuit has the messages for it numbered consecutively. The senders allot the number as they send, and both senders and receivers are watching that they miss none. The receiver merely draws a line through a number on a sheet of paper as he receives the message so numbered, so that if the sender allots a number out of sequence or duplicates a number it is noticed. Where there are two or more wires to the same town the numbers are prefixed by letters, thus: A1, A2, B1, B2, and so on. A receiver acknowledges the first message, and then it is assumed he is at his post. They often go for half an hour or an hour without breaking. If any fault comes on a line, then careful watch is kept to see no messages are dropped.

Repeaters do not seem to need much attention. In the case of three or four sets of repeaters in circuit it is found that when signals are being received well and clearly at the received end they are cloggy and nearly unreadable on the first set of repeaters. Special men are told off at the different offices to deal with repeaters.

It is said that from 275 to 300 messages an hour each way pass between Chicago and New York. About 120,000 messages a day are handled in Chicago, and about the same number in New York.

Operators come on at 8 a.m. and work until 5 p.m., and on some circuits until 5.30 p.m. Half an hour is given for luncheon. They are working as fast as the circuit will permit all the time. When a man is not fit for a circuit he is not kept at it, and either has to take a slower one or he is not wanted. Operators working the fastest circuits get 100 dollars, or £20 16s. 8d., a month. Women are paid the same as men for the same work. There were no women at the fast circuits. Other operators are paid 70 to 75 dollars, or £14 11s. 8d. to £15 12s. 6d., a month. There were not many female operators. There were many women in the machine-room perforating and writing up Wheatstone tape. The pay is about 30 dollars, or £6 5s., a month for that class of work. Wages are paid twice a month, and it was said that many men were absent after pay-day. There are no bonuses paid after a certain number of messages has been sent. Such a system did exist, but it has ceased for some years.

Wheatstone working is done, but not to a great extent. This system had not been long adopted, and it was said instruments had not yet been brought up to speed, but it is intended to persevere. Repeaters are used when the circuits are longer than about 450 miles. One circuit was seen working to New York at about a hundred words a minute, and another at about a hundred and fifty words a minute. The tape is punched on Barclay perforators. A girl can prepare four hundred messages a day if she is expert. The usual number perforated is about three hundred and fifty daily, or about forty-five an hour. Baskets are not used. The perforated tape is wound into a figure 8 and pinned to the messages, which are in batches of two, three, four, or five, but not so many as to give rise to delay. Sometimes there is only one message on