

## TELEPHONE TRAIN DESPATCHING.†

By Mr. Hatton.\*

How many are there in speaking of the transportation of the country's products, or in travelling by train, ever give a thought to the principle of train operation, or the problem of train reverse movements; in other words, the indispensable train order system?

It is not necessary for me to enter into that subject to-night, suffice it to say, that the system dates back to 1851, when Superintendent Minot, of what is now part of the Erie Railroad, issued the first train order, after vainly trying to run trains without it. The system has undergone many changes since that time, having been the subject of discussion by some of the brightest minds in the country at conventions and elsewhere, until the present almost perfect system has been evolved. From the first, the telegraph, which at that time was also only in its infancy, was the instrument of transmission of the train order. A few years later the telephone was invented, and, while it was the subject of much wonder and admiration, and likely to revolutionize methods of communication, it was not looked upon seriously by railroad men as a competitor to the telegraph, in so far as train operation was concerned. People evidently had no idea at that time of the vistas of usefulness that would later be opened up to it along that and other lines. The question of using it in place of the telegraph did, however, come in for discussion at different times, and it was actually put into use in a small way for the handling of trains as early as 1883. A few interurban electric lines adopted it some years afterwards, but it was not until 1907 that the steam railways experimented with it to any extent. Probably the first real experiment was made by the New York Central Railway in October of that year, when a telephone despatching circuit was installed between Albany and Fonda, New York, a distance of forty-six miles, followed by the Chicago, Burlington and Quincy Railway in December of the same year, with forty-five mile circuit on one of their lines running into Chicago. The trial in each case was so successful that other lines became interested, and these circuits were inspected by a great many of their representatives during the following year. In every case I believe a favorable impression was made, and those who came prepared to scoff put in a report recommending it, which resulted in the installation of a number of additional circuits on other lines, including the Canadian Pacific. The extension has since been so rapid that to-day of 87,700 miles of road on seventeen American railways over 38,000 miles are operated by telephone. I have not the figures for Canadian lines, except the Canadian Pacific, but this line has kept pace with its American neighbors by installing telephone despatching circuits on 4,858 miles of track, or on over 40 per cent. of its entire mileage, the circuit extending, with but two short breaks, from the Atlantic to the Pacific and on several of the most important branches. Before attempting to explain the reason for this remarkable growth I will give a brief description of the equipment.

The best results being obtainable from a metallic circuit, a pair of heavy copper wires is used for the line, these being transposed at frequent intervals to eliminate interference through induction from other wires as much as possible. By this means and with the use of good telephone apparatus, etc., a very clear transmission has been secured. It is not affected by wet and foggy weather, as

is the telegraph, nor is the circuit as liable to interruption from other causes. The average circuit is from 110 to 140 miles long, but that is not the limit by any means, for in one or two instances of 250-mile circuits the result is almost as satisfactory as with the shorter ones. The number of offices on each varies, of course, but often runs as high as 25 and 30. These can be cut in singly or collectively. The apparatus consists of a signalling device and the necessary telephone equipment, the latter being very similar to the ordinary telephone, the despatcher using breast transmitter and head-band receiver, which gives him the free use of both hands, and is always accessible to call from any station. The station telephone is much the same, except that in some cases an arm with adjustable transmitter and receiver attached are used. There are several varieties of signalling devices, but all work practically on the same principle, the equipment in each case consisting of what is called a master selector in the despatcher's office, whose action is semi-automatic, and a sub-selector with bell attached, in each of the stations. In the case of one of these devices the master selector consists of a number of units, that is, a separate arrangement for every office, the whole enclosed in a small cabinet, and placed in a convenient position on the despatcher's table. Each of these has a different combination, and to each is attached a small key. By giving this key a quarter turn it continues mechanically until the contact point is reached, when the circuit is completed and the bell is rung in the office having a similar combination. From five to six of these operations can be made in a minute, which, of course, means that many offices can be called in that space of time. This constitutes one of the many advantages the telephone possesses, for, in addition to the ease with which the calling is done, the responses are usually more prompt than with the telegraph, as many of our agents and operators having duties, such as checking baggage, etc., taking them from the immediate vicinity of the office, may not hear the telegraph at once, while their attention is immediately arrested by the telephone bell. It is also possible to work with one office at the same time that other offices are being called without the transmission being in any way interfered with. These features are appreciated by all despatchers, meaning a great saving of time, labor, and sometimes temper. A great amount of time is also saved in the repetition of orders, for with the telegraph a distinct operation is necessary in transmitting each character, while with the telephone the order may be repeated as fast as the operator can talk. By reason of the quickness of transmission the despatcher is also able to keep his train sheet up in better shape than ever before and with much less actual effort. There is not the same necessity for condensing or restricting information in connection with train movement, etc., which might be of great value if given, but with the telegraph is omitted, because of the time it takes to spell out letter by letter every word of such information. The despatcher is also able to speak direct with conductors and engineers if necessary, thereby securing more accurate knowledge of details than was ever possible with the telegraph. In order that train crews may get in touch with despatcher in case of a delay between stations a portable set is furnished every passenger and freight train, making telephone connection possible at any point on the line by simply hooking a jointed pole with flexible cord, which is also carried on the train, on to the proper wires and connecting it with the portable set.

By talking with agents and operators, the trick despatcher saves many messages a day that would otherwise be necessary regarding cars, etc. In fact, in a hundred ways the telephone not only saves time, but labor.

It is not easy to figure out just what these several advantages mean in dollars and cents, but it is variously

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