passed it. In this way no train could leave B if a train had left, or was about to leave A. If now it is desired to provide for following trains to leave A closer together than the distance between the passing tracks, four additional signals must be located between these two passing tracks. Diagram 7 shows the new arrangement, signals 6, 7, 8, 9, have been added to provide for a possible following movement, with the objectionable feature added that two trains might leave the passing points one from A and one from B, which would not be caught until one of the trains had reached signal No. 8 and the other signal No. 7. Here one of the trains would have to back to the passing track. In order to provide for such a movement 33.3% has been added to the initial cost, and to the cost of maintainence and operation.

Mr. Alfred Beamer, superintendent of the Northern Pacific Railway, at Spokane, has devised a system of moving trains, which dispite the fact that it has a number of objections to it, is based on the correct principles, and has resulted in giving extremely satisfactory results. This system is known as the A. B. C. rules for train operation. It is simply the staff system, with the safe guards of staff left out, the application of existing apparatus would make this system complete. The instructions issued when this system was put in service will explain fully its operation.

"All time-card trains (both passenger and freight) previously shown on time table are annulled. All the running rights that a train has at any time are conferred upon it through the medium of a block card issued by the train dispatcher.

"A block is the section of main line extending from the signal at one telegraph office to the signal at the next telegraph office in advance.

"Train or enginemen are prohibited from accepting or running on a card purpoinng to authorize them to pass an open telegraph office.

"No train will, except under flag protection, be allowed to leave a terminal or pass a telegraph office, no matter what may be the position of the semiphore, without both the conductor and engineer first securing a block card authorizing the train to use the block in advance.

"Immediately following the departure of a train from a telegraph office the operator will report its departure to the dispatcher and to the operator at the next telegraph office, in advance of the train.

"Immediately upon receipt of this report the operator at the office in advance will assure himself whether the block in advance from his office is clear, and if so, he will at once ask the dispatcher, in the form provided, for the block in advance for the approaching train. If his record shows the block in advance is occupied by another train, he will hold his signal against the approaching train until advised that the block in advance is clear.

"Having secured the block card from the dispatcher, he will at once secure from the operator at the next office in advance, a pledge of the block for the train for which the dispatcher has authorized the block card. After this has been accomplished, he will place his signal in the clear position and deliver a copy of the card to the engineer and another to the conductor as the train passes his office.

"Trains approaching telegraph offices and finding the signal at clear will understand from this that the block ahead is clear, and will pass the telegraph office without reducing speed, catching the block card as they pass. If, however, for any cause the cards should not be secured, the train will be brought to an immediate stop and will not proceed until the cards are secured.

"Conductors and engineers will immediately examine the block card, following its receipt by them, and make sure

it is correctly made out. They will follow implicitly all instructions given them thereon. If directed to take siding at a station, they will do so disregarding a signal to come down the main line. The rights conferred on the train by a block card can not be extended by a signal, but may be restricted by one.

"When taking a siding to meet an opposing train or to pass by a following train, trains will head in at the first switch at all points where lap sidings (see Fig. 8) are provided.

"All exceptions, and the name of the telegraph office in advance must be repeated to the dispatcher by the receiving operator. A card bearing no exceptions is not repeated.

"When necessary to change instructions on cards that have already been put out by the dispatcher, he will invariably do so by annulling the card containing the instructions which it is desired to change. Dispatchers will, when making a change in meeting or passing points, invariably use the words "instead of."

"All trains will be designated by the number of the engine pulling them.

STREET RAILWAYS FOR CITIES COMMERCIALLY CONSIDERED.

T. W. Sheffield, A. M. Inst. E. E.

Electric Railways unquestionably confer great benefits upon the public, and bring many advantages to a city which cannot be obtained by any other system of locomotion. The rapid growth of street railways in the East has been the means of linking up outlying districts, allowing citizens and artisans to live away from congested centres, thus giving healthier and better conditions for living than prevailed before their adoption.

They also play a most important part in the commercial development and social life of the cities. The city of Regina is admirably laid out for a street car system, there being ample room in its well laid out streets to give a good service without impeding other means of traffic, which is one of the most important features in any system, as it minimizes accidents and permits a rapid service from one section of the city to the other.

The fact of the streets being so level is also a great factor in favor of the system, as the current consumption per car mile is kept practically constant, due to the motors not being called upon to take up heavy current loads on steep gradients. An important feature in any city's progress is to avoid overcrowding and congestion at the outset; when this is done the mortality per annum is reduced to a minimum; this can only be achieved by the early adoption of a system giving cheap and rapid facilities for transportation.

The writer was for several years connected with the General Electric Company of the United States, which gave him opportunities for gauging the advantages following electrical traction both in large and small cities, and without exception he observed that it brought increased business prosperity and progress: no city having ambitions for its future greatness can ever expect to lift itself beyond restricted expansion without a well-regulated street railway system. There are many cases where towns have become stunted in their growth owing to the fact that they have not been able to focus the outlying population and outskirts into the city for ordinary industrial social advancement, progress, and buying facilities.

Cost of Living Reduced

Apart from the foregoing advantages, there is the vital question of bringing in fresh food supplies from the out-