Western Tel. Co., in Toronto and Montreal, displacing several thousand cells of gravity battery in each place, and for adaptability and general efficiency there are few superior plants to be found anywhere.

In Canada, telegraph lines are maintained under adverse conditions, which exist in few other countries similarly equipped. Long stretches of lines are maintained through rough and sparsely settled districts, and the sleet storms of winter often mean total abolition of long stretches of poles and wires over the most important routes, and involve an amount of labor and expense in their restoration little understood by the average outsider, why has merely a grumble to offer if his business cannot be got through in all kinds of weather.

Aside from the position which the telegraph occupies in our midst as a simple means of sending and receiving messages, it might not be out of place to enumerate a few of its more important outside functions. I need not say in this connection that there is no more vital adjunct in the operation of our great railways to-day than the telegraph. Railway telegraphy is in fact an art in itself, without which many of our more important railway systems might be likened to ships without rudders.

The collection and distribution of market reports is a service performed by the telegraph companies which is worthy of special mention. By means of tickers and special delivery are daily distributed amongst our brokers and others continuous quotations from the markets of Liverpool, London, Beerbohm, Chicago, Milwaukee, St. Louis, Duluth, Detroit, Toledo, New York and Paris, in both stocks and grain; a service which serves to keep those interested in continual touch with all the great markets of the world.

The gathering and distribution of reports in connection with the Meterological Department is another service which is of inestimable value to many of the most important interests in the country.

The press service of the telegraph companies is also an important feature in connection with their business. I need not remind you that it is by means of the telegraph, broadly speaking, you are enabled to discuss so readily the affairs of the world, and look so wise and weighty. In Canada a regular system is in operation, whereby every telegraph agent is also an agent indirectly of the press; forwarding to headquarters such items of public interest happening in his town or neighborhood as he is required to send, and which is afterwards sifted and made use of by papers here and elsewhere. That the politics and political opinions of the country are largely moulded by the press, there is little question. In fact many papers are primarily in existence for no other purpose than to serve political ends. Latter day enterprise in journalism is a source of constant wonder. In the dissemination of both political and legitimate news there is no one factor more important than the telegraph.

These are of course facts almost too well known to require repetition at my hands, but mere mention of the part played by the telegraph company in connection therewith is sufficient to indicate the magnitude of its mission. As an instrument in the higher civilization of man it has no peer, and that we it Canada have shown ourselves so thoroughly alive to this fact is certainly; matter for congratulation.

Owing to the space taken up by reports of conventions, we are obliged to greatly curtail the news items and to hold over a quantity of editorial matter.

STEAM BOILER EXPLOSIONS.

BY A. E. EDKINS, TORONTO.

Scientists have given the subject of "Steam Boiler Explosions" a good deal of attention; in fact some of them have given it so much attention in the past that the cause of such accidents would be shrouded in mystery far too deep for men of average learning and common sense to fathom, if all the theories advanced by them as the cause for explosions were taken for granted.

We are supposed to, and we assuredly have, more experience in the design and construction of steam boilers than our predecessors of 30 or 40 years ago, yet in spite of this it is no uncommon thing for boilers to give way without a moment's warning, through imperfections or mismanagement, and in many cases such accidents have been attended with the loss of many valuable lives and the destruction of much property.

It is at times difficult to draw the line strictly between what constitutes an explosion and what might be termed a burst, rupture, or local explosion. I think myself that the term "boiler explosion" should infer that the whole of the stored energy within the boiler had been instantaneously released; and the boiler itself rent into two or more pieces. Anything less than this I think would be properly designated as a burst, rupture or collapse, as the case may be. On the other hand, some engineers will insist that either one of these occurrences constitutes an explosion, and, as I have said before, it is sometimes difficult to draw the line exactly at the spot where the rupture or burst merges into the explosion. But, as "operative steam engineers," we are more directly interested in the most probable cause and the most efficient means to be adopted for the prevention of explosions.

A steam boiler under pressure is practically a storehouse or magazine containing a certain amount of energy or explosive force, and this amount (which is always enormous) is exactly proportionate to the weight of water and steam contained within it. This is a fact. which, so far as I have been able to ascertain, is not realized by the average attendant of steam boilers, as it is quite a common thing, in the event of an explosion of great violence, to hear men attribute the cause thereof to a lack of water in the boiler, and some will even go so far as to infer that the boiler must have been empty and red hot, and the explosion caused by turning on the feed pump and throwing cold water on the red hot sheets, which being evaporated into steam (instantaneously), is of sufficient pressure to cause the destruction of the boiler. One of the principal objects of this paper will be to try and put the "low water theory," as a cause for violent explosions of boilers, before you insuch a light that we may all see the absurdity of this most commonly accepted theory given as the cause of so many violent explosions.

The total energy or explosive force contained within a steam boller under pressure is just as computable a quantity as the power developed by a steam engine, and for the information of those who may feel inclined to go into the matter fully, I would refer them to "Steam Boller Explosions," by R.H. Thurston; but for the purpose of this paper I have thought it best to take the results of such formula and experiments which have been arrived at and made by such eminent engineers as the several who have treated and experimented on and with this question.

The energy of water and steam confined in a steam: