like the Canadian Pacific, an international line of communication. Further particulars with reference to the conditions under which the road is to be built can be obtained from the Commissioner of Railways, Adelaide, the Agent General for South Australia in London, or the North Australian League, Melbourne.

ENGLISH PLUMBING METHODS.

BY W. M. WATSON.

For over five months last year I was employed as leader in a plumbing and steamfitting shop in Nottinghamshire, Eng. The object of our principal and owner was to secure new ideas, and it gave me the opportunity of investigating some new methods of sewage cleaning, drainage systems, etc. While there I corresponded with W. J. Burroughes, formerly master plumber of this city, now in business in London, and three of the American plumbers' and steamfitters' supply merchants, who keep in stock articles used by the trade in Canada, which is handy for Canadian steamfitters who go over to Great Britain to do heating work, because many of our handiest kind of fittings are not yet made by British manufacturers. They cannot, or they will not, see the value of them. I was apprenticed and for a few years in business in England myself, before coming to Canada. I also visited the North of England in 1896, and from having lived there well understood the habits and methods of the trade as carried on over there. During the twenty years I have resided in Canada I have witnessed marked improvement in the style of arranging heating pipes and heat distributors, and expected that the British mechanic would have advanced with the times, and would have adopted the new and improved scientific ideas that have been published and explained in the press, but it is very evident that they have never carefully read them, and they do not yet understand anything more than that hot water circulates, the hottest seeking the highest and the coolest the lowest points in the system. They have no idea of arranging the pipe lines and radiators in a way that the flow shall be even and quick, and make a true and perfect circuit void of pockets and dead spaces. I examined many apparatuses that were supposed to be in working order, that would have worked far smoother with at least one-third less coal, and with less leakages had about half the weight of metal been used in their construction and the pipes run so that the flow could easily pass along on its rising course without friction. They still use cast-iron pipe for sizes of 2-inch and upward, and instead of giving their pipe lines the proper swing to allow for expansion, they use a clumsy cast-iron expansion joint that rusts fast during the months the apparatus is out of use, and when it is lighted up again they leak if they happen to move, and if they do not move, the expansion of the pipe line causes something to give way. They use the old pattern wrought-iron square box for heating water for domestic purposes. They cannot believe that a few feet of iron pipe placed behind a kitchen fire, or run round a baker's oven fire, will heat more water and be less liable to get damaged by the forces of expansion than the heavy clumsy box that costs ten times more than the pipe, and that never works satisfactorily for more than a year at a time. Everything must be heavy, clumsy and very expensive to suit the British workman, and a Canadian examining such heating appliances is dumbfounded to find such ignorance existing among his fellow tradesmen in the twentieth century.

Everyone that conversed with me on the American heating subject assured me they were up to every point that any American was, and pointed out to me that they used a radiator similar to that used on this side of the Atlantic. They also used the hot water cylinder. Yes, so they do, but the way they fix them, and the useless lengths of costly pipe and fittings they attach to them, would surprise an American builder. For example, there is a hot water apparatus placed in a 600-year old church, situated 14 miles from Nottingham, near the place where the great underground caves used by Robin Hood and his followers can be seen, and where the moulders' sand comes from, used often in Toronto. This heating was done up to style, and date, expense not being considered. The church has a stone floor, and is void of all plaster on the walls. The contractor thought he had adopted the American indirect system of heating. He sunk several square pits into the floor of the church, and filled them with pin radiators, but omitted to provide a current of air to carry the heat thrown off by the radiators up into the church, and the result is the church was never comfortably heated or ventilated, though by far too much fuel was used for the purpose. I was shown this apparatus, and heard the complaint of its worthlessness, and I could not help telling the party that the English fitter was stupid, and if the system had been installed by an American fitter, and he had used the same materials, the church would have been properly heated and ventilated at a far less cost, both for construction and fuel.

When I was over there was during the Coronation season, I came in contact with many leaders of society, and almost daily had to give long talks on Canada, and its trades and customs. I believe that the wealthy classes and public bodies are very anxious to have the very best systems of heating they can secure. I met many persons that had been over here on a visit, and who had noted our artistic designs, adopted in our methods of attracting and radiating of artificial heat and ventilating of buildings, and there is an unlimited quantity of such trade ready to be picked up at good prices and prompt cash payments, but in all cases where any business is done the leading working fitter must go over from this side, and young men must be taught our way of working, who have not been contaminated by being in a plumbing or heating shop, for if the men that I had to lead while over in England be a true sample of those who work in the shops then it would be wise not to use such men and boys when constructing such work.

Steam and water heating goods can find a market in the North and Midland counties. London and its surroundings are fairly well supplied with merchants selling our goods. But to secure trade our manufacturers must show their own goods in all the leading central market towns, and provide skilful fitters to handle them. This would bring profit to the manufacturers and fitters, and greatly please many of the capitalists and property owners over there.

BOOKS AND PAMPHLETS RECEIVED.

A Treatise on Roads and Pavements, by Ira O. Baker, C.E., Professor of Civil Engineering, University of Illinois. John Wiley & Sons, scientific publishers, New York. Price, $5. A most useful work for engineers.

Elementary Applied Mechanics, by T. Alexander, C.E., M.I.C.E.I., Professor of Engineering, Trinity College, Dublin, and A. W. Thomson, D.Sc., Professor of Engineering, College of Science, Poona. Macmillan & Co., London. An excellent work for the engineer or architect.

Metallurgical Laboratory Notes, by Henry M. Howe, Professor of Metallurgy in Columbia University, New York Published by the Boston Testing Laboratories.

The Minerals and Mineral Localities of Texas, by F. W. Simonds, Ph.D., Professor of Geology in the University of Texas. Published as a Bulletin of the University Mineral Survey, W. B. Phillips, director, Austin, Texas.

Annual Report of the City Engineer of Halifax, N.S., F. W. W. Doane, C.E.

Rainfall Notes, Nova Scotia. Paper read before Nova Scotian Institute of Science, by F. W. W. Doane, C.E., City Engineer, Halifax.

Western Canada. British Columbia. Two pamphlets issued by the C.P.R.

Opinion of Judge Cox in the suit of Weston Electrical Instrument Co. vs. Keystone Electrical Instrument Co. re certain U. S. patents.

Economical Gas and its Application to Lighting, Heating and Motive Power, by J. deClercy, Engineer of Arts and Manufactures of Paris.