

rolled sections, but plates were used with section stiffeners and butt strap jointing. The result has justified the means for the bridge apparently possesses ample stability. It has been severely criticized as wasteful and clumsy, but after all those faults are on the right side. All the material works to the best advantage, for it is disposed at a maximum distance from the axis. It is a pity that the Quebec bridge failed, for it throws doubts on the method of construction. It must be admitted that American bridge designers have done excellent work; they have been compelled by the engineers of the country to find out how to make great bridges from merchant material, and they have taught the world much on stresses that only close designing could have found out. It has been said by an experienced engineer that the engineer should never let himself be caught too far off precedent; that is to say he must not allow himself to assume that things which hold good from size 1 to size 2, and so on to size 3 or 5, will necessarily hold good if proportionately designed for, say size 20. The jump is too great. If we look back on all engineering, whether civil or mechanical, we shall find ourselves confronted constantly with failures like that of the Quebec bridge. Some man takes a big forward step and differences step in that have not been apparent in the earlier stages.

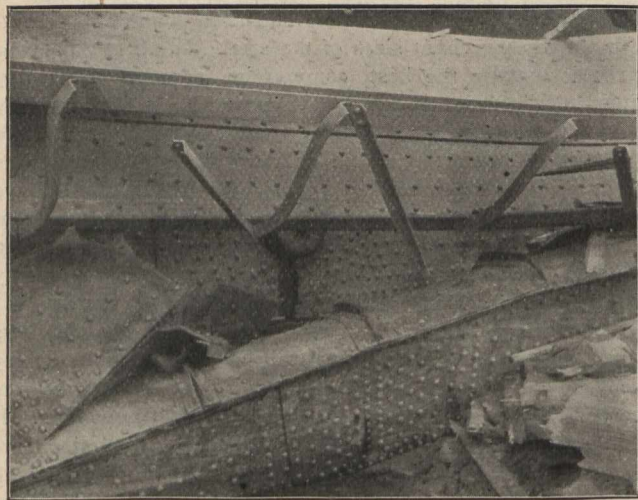
Thus it is that all machines have grown slowly. The gas engine to-day is a sample of slow growth. Apparently it is very like a steam engine, yet with all the experience of the large steam engine to guide designers the large gas engine has advanced along a wreck strewn path. The steam turbine grew slowly, but in the new Cunarders a big step was taken, but the Cunard Company took good care to build the "Carmania" first as an intermediate step. The success of the "Lusitania" is a proof of the singular engineering ability employed in the big shipyards. The greater success of the "Mauretania" on her trial trips seems to point to something having been learned from the "Lusitania." Ordinary engineering is one long record of failures, but they have not perhaps destroyed much life. When a disaster kills men we hear of it, but in principle the failure of a bridge is no worse than the failure of some abnormal engine or dynamo.

W. H. BOOTH,
M. Am Soc. C. E.

London.

CANADIAN SOCIETY OF CIVIL ENGINEERS VISITS QUEBEC BRIDGE.

Upwards of 100 members of the Canadian Society of Engineers paid a visit to the ruins of the Quebec Bridge on November 9th. Transportation was very kindly provided by the Intercolonial Railway. The party was met by Chief Engineer Hoare of the Quebec Bridge Company, along with



Broken Chord Joint of Quebec Bridge Between Panels, Showing Lacing.

a number of other Quebec engineers. Mr. Hoare had placed at the disposal of the society the services of Inspector Kinloch, of the Quebec Bridge Company, who spared no pains to point out the more interesting features of the wreck.

The trip afforded an opportunity to a great many students as well as practising engineers to visit the site of the greatest modern bridge disaster, and in the light of what has developed in the inquiry, to observe the results of the collapse of one of the greatest steel superstructures ever erected. In all there were present 115 officers and members of the society, some 55 of those who made application for transportation having failed to be present.

The following officers and members were present:—W. McLea Wallbank, president; P. Johnson, vice-president;



President Walbank, and Chief Engineer Hoare of Quebec Bridge Company.

Professor C. H. McLeod, secretary; Messrs J. A. Jamieson and W. F. Tye, members of council.

Messrs. F. W. Anderson, J. L. Allison, A. Arsenault, T. C. Allum, editorial representative, "Canadian Engineer," G. E. Bell, C. Brandeis, J. B. Brophy, J. A. U. Beaudry, A. Birch, F. P. Buchanan, M. C. J. Beullac, N. F. Ballantyne, E. E. Brice, E. Bregent, A. Buteau, O. Baudouin, J. J. Collins, P. Chevalier, S. B. Code, U. Chopin, A. Chausse, R. de B. Corriveau, W. P. Copp, P. E. De la Cour, N. P. Dalziel, A. H. Dion, K. W. Dowie, H. P. Dwight, C. W. Drysdale, J. Duchastel, L. A. Dufresne, J. Ewing, J. H. Edgar, W. M. Everall, G. H. Ferguson, A. Gray, C. E. Goad, A. J. Grant, R. M. Hannaford, L. Hurubise, N. M. Hall, H. Hadley, Jr., H. M. Haughton, F. C. Jewett, W. A. Kennedy, E. C. Kirkpatrick, F. T. Kaolin, W. D. Lawrence, W. A. Logan, R. Lesage, W. L. Leslie, G. L. Law, B. Leman, O. Lefebvre, F. G. MacLeod, F. O. Mills, N. M. McLeod, H. V. Morris, B. D. McConnell, J. E. A. McConville, A. W. K. Massey, J. L. Michaud, J. L. Millar, W. B. McLean, D. L. McLean, A. McCulloch, G. E. McCuaig, P. B. Motley, M. Neilson, T. J. Norton, W. E. O'Brien, C. E. Osler, H. H. Pinch, P. L. Pratley, J. H. Parent, O. Poissant, D. Renaud, H. W. Read, L. N. Rheume, A. Roberts, J. W. Le B. Ross, J. A. Roy, E. A. Rhys-Roberts, G. Sproule, A. T. Spencer, H. E. Sutherland, T. G. Sherwell, R. O. Sweezey, S. W. Smith, L. Sherwood, R. Steckel, J. H. Sullivan, W. G. Scott, J. B. Spence, F. de Sieyes, F. R. Smith, W. J. Sproule, A. Bromley Smith, D. C. Tennant, W. V. Taylor, W. Chase Thomson, J. H. Trimmingham, I. A. Vallieres, H. E. Vautelet, J. P. Watson, H. A. Whitley, W. T. Wilson, E. T. Wilkie, E. J. Walsh, N. de C. Walker.

President Walbank of the Canadian Society of Civil Engineers and Chief Engineer Hoare of the Quebec Bridge Co. may be seen discussing the accident from the bank overlooking the bridge. The accompanying cut, taken while the party were at the wreck, shows the broken chord joint between panels, also style of lacing.