

The general arrangement of the specifications is exceptionally good. There are twenty-seven sections, each section dealing with some distinct branch of concrete bridge building. The sections dealing with design are not as complete and well arranged as those sections dealing with construction. This is evidently the result of the author having viewed his work from the construction engineer's standpoint.

A few points might be mentioned to illustrate the above contention. The loading specifications call for the uniform live load to be 100 lbs. per sq. ft., sidewalk and road, regardless of the length of the bridge. The concentrated loads are, if anything, too heavy. A few diagrams showing wheel-spacing, etc., would have been a great help to the designer. In Section II., "Rules for Computing and Designing," "the length of span for reinforced concrete beams, girders, slabs, etc., computed as simple beams, shall be considered to be the clear distance between supports," is one of the clauses. Very few specifications are as liberal as this. In a general specification like this it would have been better to have given a graded scale of temperature ranges rather than a range for latitude  $40^\circ$  only. In concrete arches the temperature plays a very important part, and has generally a greater range than  $+35^\circ$  Fahr., as specified. A clause dealing more fully with this would not be out of place. The specification for bonding of steel rods in concrete are very liberal. Fifty per cent. may be developed by a  $90^\circ$  bend, and deformed rods are allowed to be bonded in one-half the length of plain rods. The results of the recent tests, as published in Bulletin No. 71 of the University of Illinois, do not bear out these specifications.

Sect. IV., "Formulae," hardly has a place in a specification. These formulae are given in all test books and are quite standard. Formulae Nos. 1, 16 and 17 are evidently printed incorrectly.

Sect. V., "Quality of Materials," is the standard requirement of the American Society for Testing Materials.

Sect. VI., "Proportioning, Mixing and Placing Concrete"; Sect. VII., "Placing Reinforcing Steel"; Sect. IX., VIII., "Placing Concrete in Cold Weather"; Sect. IX., "Forms and Centres," are all very well written and arranged, and if followed will produce a high-class product.

Sect. X., "Surface Finish," and Sect. XI., "Waterproofing," are excellent, and cover in six pages the various methods of modern practice in this rapidly developing branch of engineering. Sects. XII. to XXI. treat the following subjects in an able and concise manner: "Reinforced Steel Construction," "Cast Stone and Blocks," "Concrete Piling," "Inspection and Tests," "Retaining Walls, Abutments, Piers, etc.," "Concrete Arches," "Reinforced Concrete Slabs, Beams, Girders, Columns and Trusses," "Foundations and Footings," "Timber Piling," "General."

The last six sections are a valuable addition to bridge specifications; they deal with the pavement on the bridge. The titles of the sections are: "Cement Walks, Concrete Curbs and Roadways," "Brick Pavement," "Wood Block Pavement," "Sheet Asphalt Pavement," "Wood Block Pavement," "Bituminous Pavement."

Taking the specification as a whole, there are few, if any, concrete bridge specifications that cover so much ground and yet are so concise and well arranged. No engineer will make a mistake in adopting these specifications.

**Proceedings of the Pan-American Road Congress**, held at Oakland, California, September 13, 14, 15, 16 and 17, 1915. (Reviewed by S. G. Talman, A.M.Can. Soc.C.E., Roadways Department, City of Toronto.)

This comprehensive collection of papers will prove a very valuable addition to the library of the highway engineer, and is instructive reading for the layman road user interested in good results and how to get them. To cite one example from the many, the paper, "Highway Indebtedness; Its Limitation and Regulation," deals with facts with which every taxpayer should make himself familiar. Besides the purely technical, the papers treat the subject from every possible viewpoint, such as historical, financial, legal, etc. American thoroughness marks the proceedings from beginning to end.

## PUBLICATIONS RECEIVED.

**Economic Methods of Utilizing Western Lignites.**—Bulletin No. 89 of the United States Bureau of Mines.

**The Canadian Railway Club.**—Official proceedings, April, 1916. This issue contains a paper by S. J. Sargent on "The Railways of India."

**The Resources of Tennessee, No. 2, Vol. 6.**—A magazine devoted to the description, conservation and development of the resources of the State of Tennessee. This number contains articles on phosphates of Johnson County, Tennessee, and notes on manganese in East Tennessee.

**A Matter of Opinion.**—Issued by the Canadian Forestry Association, Booth Building, Ottawa. The pamphlet is from the pen of Robson Black, the secretary of the Association, and is designed as a warning with the object of preventing, as far as possible, the firing of our forests.

**Reports, St. John, N.B.**—A 400-page booklet containing the reports and accounts of the city of St. John for the year 1915. Includes reports by William Murdoch, city engineer; F. L. Potts, works commissioner; A. Winchester, superintendent of streets; and G. N. Hatfield, road engineer.

**Patent Protection.**—Issued by Babcock & Sons, patent attorneys, Montreal. Gratuitous distribution. Deals with protection of inventions in Canada, United States and abroad. Well indexed. Covers costs, patentability of inventions, time required to obtain patent, and many similar matters.

**Regulations Respecting Highways, 1916.**—Issued by the Department of Public Highways, Ontario. It contains the regulations of the Department of Public Highways with respect to county road construction, maintenance and repair under the Highway Improvement Act and the Ontario Highways Act.

**Reasonable Regulation of Railroads.**—A report submitted to the Joint Committee on the reasonable regulation of railroads, which committee was formed in March, 1915, by representatives of ten of the leading commercial organizations of Philadelphia. Copies of the pamphlet can be secured by addressing Mr. Emil P. Albrecht, 214 The Bourse, Philadelphia, Pa.

**Standard Specification for Cast Iron Water Pipe and Special Castings.** Issued by the Canadian Society of Civil Engineers. These specifications, which were approved for re-printing by the Annual Meeting of the Society held in January last, have now been issued. Contains thirty-four