

71. Detroit Bridge and Iron Works, Detroit, Michigan, U. S.

BRIDGE OVER THE MISSOURI RIVER AT ST. JOSEPH, MISSOURI.

Report.—This bridge is remarkable for the difficulties attending the construction of its foundations in the Missouri River, having been sunk to the bed-rock in that stream. Commended for the substantial character of the masonry of its piers, the economy of design in the superstructure, and the general excellency of workmanship.

72. Clarke, Reeves, & Co., Philadelphia, Pa., U. S.

THE GIRARD AVENUE BRIDGE ACROSS THE SCHUYLKILL.

Report.—Messrs. Clark, Reeves, & Co. give a useful engineering exhibit. The Girard Avenue bridge, to which they especially call attention, is about equal in size to the bridges across the Thames in London. It is a good and well-designed engineering work, and is an excellent specimen of the method of bridge building advocated by this firm. They give many other samples of structures erected by them, some of very large size, that designed for Lewiston, Niagara, having a span of six hundred feet.

In addition to this report, the Judges desire to commend the Girard Avenue bridge at Philadelphia for the beauty of its design.

73. Charles Macdonald, New York, N. Y., U. S.

DRAWINGS OF BRIDGES EXECUTED.

Report.—The drawings are explanatory of bridges that have been executed, of considerable size, and which appear to be well designed; for instance, the Charlotte drawbridge, and the Oswego bridge, on the Watertown and Ogdensburg Railway.

74. J. Dutton Steele, Pottstown, Pa., U. S.

MODEL, DRAWING, AND DESCRIPTION OF THE FALLS STONE BRIDGE.

Report.—This bridge has six oblique stone arches, each of eighty-three feet span, and is a good specimen of the ribbed stone system of masonry in arches in lieu of building them in spiral courses, which is more commonly the method adopted in building oblique or skew bridges.

75. The Keystone Bridge Co., Philadelphia, Pa., U. S.

IMPROVEMENT IN PIVOT OR SWING BRIDGES, AND RIVETLESS COLUMNS.

Report.—This company exhibited a useful and instructive selection of engineering structures.

The Raritan Bay pivot or swing bridge, of which a carefully constructed model is exhibited, is of itself a work worthy of notice.

It is the largest pivot or swing bridge yet constructed, the movable portion being four hundred and seventy-two feet in length, and it presents some important details in design and execution.

The rivetless tubular columns, while giving the requisite strength, admit of forms and proportions suitable for architectural purposes as well as for engineering works.

76. Frederick E. Sickels, Providence, R. I., U. S.

PLANS FOR SINKING AND HOLDING PNEUMATIC PILES.

Report.—This method is a valuable improvement upon the ordinary method of sinking pneumatic piles, the air lock having hitherto been always used above the water, thus necessitating its removal as each section of pile had to be added, and the replacement of the