PHOENIXVILLE BRIDGE WORKS.

The Works of the Phoenix Iron Company, at Phoenixville, Pa., are conveniently situated with respect to the ore-beds and coal-fields of the eastern part of that State, and within easy reach of the markets of the country by means of the admirable systems of transportation afforded by the Philadelphia and Reading and the Pennsylvania Railroads. Not only because of the quantity and high quality of their product have these Works won a world-wide reputation, but also by reason of the large extent and the well-planned arrangement of the many furnaces, mills, and shops that constitute the plant of the Company. Beginning on a small scale in the year 1790, these works were materially enlarged in 1827. In 1842 very extensive additions were made in the shape of a complete puddling-mill with six single furnaces, a Burden rotary squeezer, and a train of rolls, this being the first establishment in the Schuylkill Valley to begin the puddling of iron on a large scale. In 1845 two blast-furnaces 15 by 59 feet were built, and in 1846 a third blast-furnace 15 by 50 feet was put up. These furnaces are still in operation, but have been greatly improved by the addition of such modifications as have been brought forward from time to time and approved by the usage of the best iron-workers. In 1846 a large mill for manufacturing railway iron was erected and equipped with a complete set of furnaces, engines, and rolls requisite for the production of such material.

In this mill was rolled much of the railway iron that was used in the construction of the pioneer railroads of this country, and its products were well known in every State of the Union. In 1855 the ownership of the works was merged into a stock company under the title of "The Phoenix Iron Company," and the manufacture of beams, channels, tees, and a variety of shapes of iron was begun. The capacity of their shops and foundry having been enlarged, they entered upon the construction of bridges, roofs, and other varieties of structural iron-work, and this department of their business has steadily increased in importance since its establishment. During the civil war many hundred wrought-iron field-guns were made at these works, as well as large quantities of material for ordnance service and naval stores.

In 1862 the Phoenix column was introduced to the market, and in 1866 the manufacture of eye-bars forged by hydraulic pressure for bridge-links was begun.

These two important factors in the construction of bridges, and furnishing engineers with their material arranged in the most perfect forms for resisting the strains of compression and tension, have performed signal service in developing the American type of bridge, and have made practicable the rapid and economical manufacture of engineering structures adapted to a great variety of purposes. In 1870 the works occupied an area of about 30 acres, but so steady had been the demand for their product, and so wide was the field for its employment, that it was then considered advisable to make provision for such enlargement of their capacity as would enable them to meet the requirements of their business in a more satisfactory manner. A large building, covering about 61 acres under a single roof, was erected, and a complete outfit of gas producers, regenerative furnaces, compound engines, and trains of rolls planned for its equipment in the most thorough manner. This building served as a model for the architects of the Centennial Exhibition buildings, and is admirably adapted to the special requirements of a large rolling-mill. It is 928 feet long, 288 feet wide, and 30 feet high to the square. It is built almost wholly of iron and glass. Two long parallel sheds connected by four spacious transverse courts, enclosing three interior courts, will convey, in brief description, some idea of the general plan.

Two views of the Works are presented in this album, from photographs, which give some idea of the general arrangement of the plant, but necessarily omit much, and but inadequately represent its magnitude. One of them shows, in part, the new rolling-mills. Back of this building is that of the gas-producers, 69 feet wide, running the length of the main building and separated from it by a passageway of 150 feet. The second view represents the blast-furnaces, puddling- and old rolling-mills. On the opposite side of the creek, in front of them, but not shown, are the various shops, foundry, and other buildings used in the manufacture of bridges.

The drainage, water-pipes, steam-pipes, and gas-pipes form an intricate system under the iron floor that is quite hidden from the visitor, but, like the circulation of a living organism, a system most essential to the vitality and action of the body that is dependent upon it. The recent adoption of gaseous fuel has enabled manufacturers to regulate much more satisfactorily the quality of their iron by keeping it clean and free from ashes or dust during the process of heating, as well as by giving a thorough control of the temperature desired in the furnace, and these advantages are obtained in this mill by the use of all of the appliances yet devised for the purpose.

From these furnaces the iron is rolled into the various forms required in the construction of buildings, bridges, and ships by passing it between rolls having in them grooves of the form it is desired to give to the bars. From the mills such bars as are to be further worked up into the construction of bridges or buildings are taken to the machine-shops.

These buildings, the largest covering about an acre and a half of ground, contain