WATER-WORKS BUILDINGS, ERIE, PA.

THE view of the water works at Erie, Pennsylvania, is presented as an example of a truly American structure, built with a view to economy, and at the same time presenting an attractive picture. The building is not ornamented and decorated in elaborate style, as are some of the European water works; but, while it preserves a pleasing symmetry, it explains, almost at a glance, the object of its construction; and, in regard to the small amount of time and money required, and the completeness and adaptability to the work intended, it must be looked upon as a triumph of engineering skill.

What strikes us as peculiar about this design is that it cannot mislead any one. It does not resemble a schoolhouse, a penitentiary, or a freight depot, as too many of our works of this class do. It has a certain distinctive character about it that leads the understanding to a prompt decision on its particular object, the purpose for which it was erected, and in this, as in the excellent arrangement throughout, much credit is due the engineer, Mr. H. P. M Berkinbine, who designed and carried out the works to completion.

The view is taken from the west and exhibits the side of the works. They are situated upon the bay, at the foot of Chestnut street, and face the lake. Water is taken from the lake, one thousand feet from the shore, and conveyed by a conduit in a pier to the pump wells in the engine house. The pier is cut by a number of sluices; thereby insuring pure water at the inlet, which is thirteen (13) feet below the surface of the bay. The water is raised into the standpipe by means of two (2) Cornish Bull engines. They are upright engines, and measure, from the bottom of the bed-plate to the top of the cylinder cap fifty-two (52) feet, they are exactly alike. The steam cylinders are sixty (60) inches in diameter, and the pumps twenty-one (21) inches in diameter, the length of stroke is ten (10) feet.

These engines are driven by eight (8) double flue boilers, each, forty-two (42) inches in diameter, and thirty (30) feet long.

The pumping capacity of the works is 4,000,000 gallons in seventeen hours, running the engines at twelves strokes each per minute; they can be worked with safety to a speed of sixteen strokes per minute, thus greatly increasing the supply.

The engine house was built to accommodate the engines; it is $30' \times 35'$, and $65'$ high, built of sandstone and brick. The walls are very heavy, to sustain the weight of the engine, which is done by means of wrought iron beams and columns. The boiler house is $50' \times 60'$ and 12 feet high to the square of the roof, this is of brick with sandstone dressings. The stack is $100'$ high and has a draft of 25 square feet.

The most imposing feature is the standpipe, (the highest in the world,) it is a straight, wrought iron tube, 5 feet in diameter and 217 feet high, resting upon a cast iron base plate. This pipe is used to equalize the flow of water from the pumps, all shocks or waves being lost in it, and as the city did not feel that at present it could afford a reservoir, a uniform pressure upon the street mains is maintained by this standpipe. Its mode of construction was similar to the Irishman's who built his house by holding up one brick and laying another under it. For the upper sheets were rivetted together and held up while the next series were attached below, and thus the pipe was slowly raised by adding to the bottom until it was complete and rested upon its base.

On account of the cold and stormy weather at Erie, the standpipe is enclosed, and a spiral staircase passed

around the iron pipe, and between it and the enclosing wall, whereby visitors can reach the summit and enjoy a grand view of the city, lake, and the country for miles which can there be had. For those more timid a less elevated lookout is provided on top of the engine house. Mr. Birkinbine, the engineer, can boast of not only introducing the use of the standpipe into American waterworks, but of constructing the highest. The first he erected at Germantown Water-works, in Philadelphia, in 1851; it is one hundred and thirty (130) feet high. The second at West Philadelphia Water-works, in 1854; it is 130 feet high, with a spiral staircase surrounding it. The third at Kensington (Philadelphia) Water-works, 170 feet high, handsomely ornamented at the top. The fourth at Camden, N. J., with a finial covered with patent metal, and last but largest at Erie, 217 feet high.

The works were commenced April 15, and started December 25; 14 miles of pipe were laid, with the requisite fire plugs, and street stops, and the city of Erie has the comparatively small bill of less than $350,000 to pay for a good and efficient supply of water. Already the works have paid their interest in checking fires in the city—several times by plug streams alone—as the head of water is sufficient to throw a stream over any building in the city.

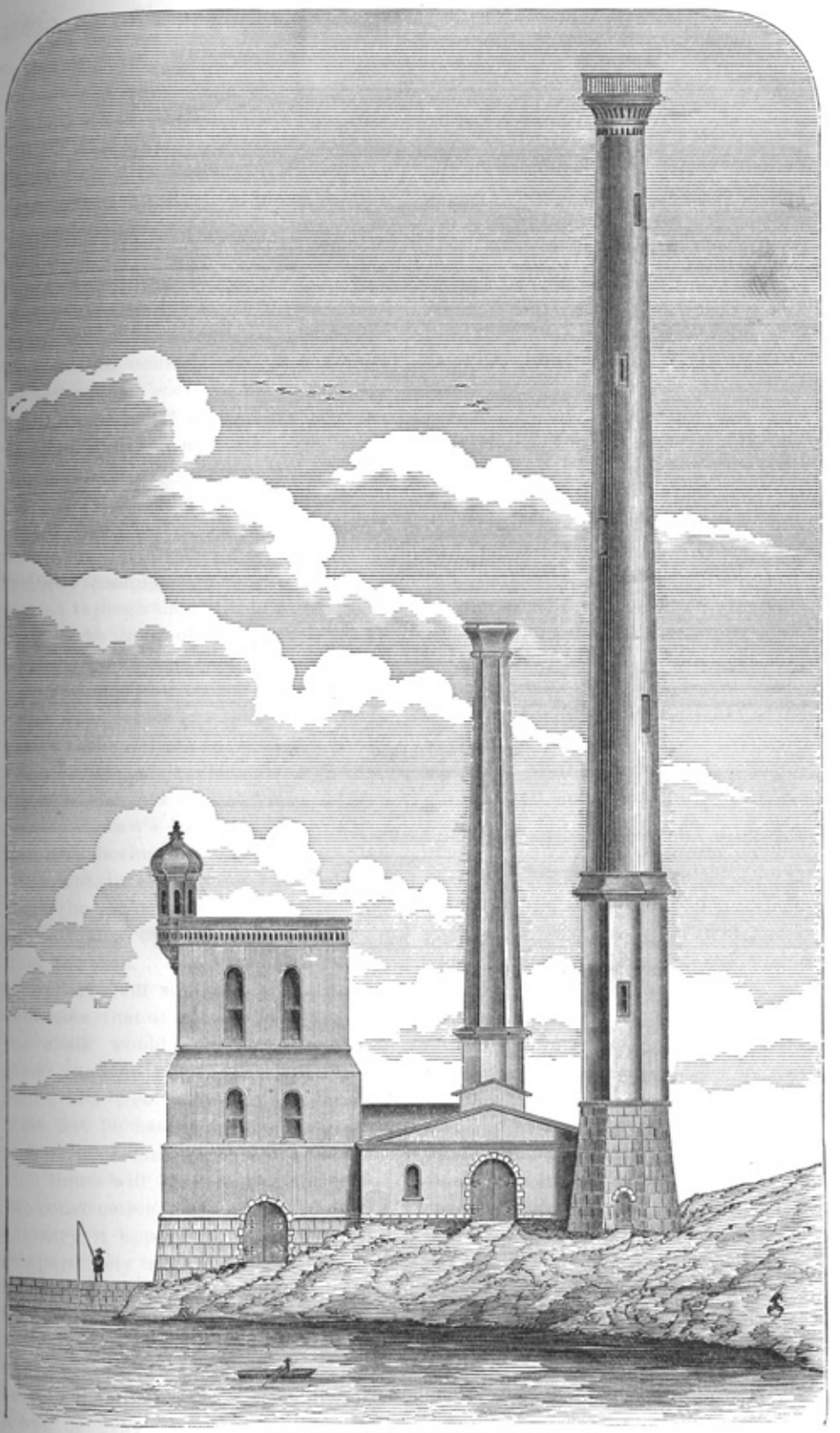
The Cornish engines are generally considered as being divided into two classes, "*Beam* and *Bull.*" The first named class are constructed with a heavy beam working either above, on the sides, or below the cylinder, one end being connected with the piston-rod, the other with the pump plunger. The *Bull Cornish engines* are constructed without such beam, the cylinder being inverted and placed immediately over the pump, and the piston-rod directly connected with the pump plunger.

The engines in the Erie Water-works are of this latter class.

The Cornish engine is single acting, receiving live steam upon one side of the piston only, and was originally designed by that great inventor, James Watt. It is used very generally in England for raising large amounts of water for supplying cities or draining mines. The name Cornish was given to it on account of the almost universal use of this style of engine in Cornwall mining districts. In this country it has never been popular, but it is now rapidly making friends among our engineers, and if in future years, it can maintain the present reputation as the most efficient and reliable and least expensive (in the amount of fuel required to do the same work) pumping machine—we may look upon it as our great stand-by for lifting water. Already we have quite a number of Cornish engines in use. Philadelphia has five; Easton, Pa., one; Louisville, Ky., two; Cleveland, Ohio, two; Jersey City, two; St. Louis, two; and Buffalo, two; besides there are several of considerable size in use by private corporations, draining mines or supplying canals.

Surely Erie is ahead in water works, and we are proud that it is indebted to a Philadelphia engineer for this superiority.

THE THAMES TUNNEL, commenced in 1824, by Sir Isambard K. Brunel, and after many difficulties completed and opened in March, 1843, has been closed as a public footway. This tunnel cost $3,000,000, and never paid interest on the investment. It was never used as a means of transit under the Thames, between Rotherhithe and Wapping, but was visited as an object of interest. One of the roadways was closed, and the space between the arches used as shops, for the sale of fancy articles, purchased merely for mementoes. On July 21st, the tunnel was closed, having been purchased for the sum of $1,000,000, by the East London Railway Company, for the purpose of running their trains into London.



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