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## RAILWAY BRIDGE, NEAR YORK, ENGLAND.

We publish herewith a view of a fine railway swing bridge, erected over the river Ouse, near York, England, by the North Eastern Railway. We are indebted to *Engineering* for the illustration of the structure, which consists of three openings, namely, one fixed span of 107 feet over all, and a double swing span of 176 feet over all, leaving a clear opening for vessels of about 62 feet, the river being navigable for small craft some distance above the bridge.

The swing portion of the bridge is supported on a pier of cast iron situated on the north bank of the river, this pier being composed of one central column 7 feet in diameter, containing a hydraulic accumulator, and eight supporting columns each 4 feet in diameter carrying the roller frame and path. The weight of cast iron in the pier, exclusive of the foundation cylinders, is about 280 tons.

The swing portion is formed of two main girders, 176 feet in length and 14 feet in depth between flanges over the swivel pier, where they are connected together at the top by cross girders, carrying a platform, from which is regulated the working of the bridge. The flooring is composed of 23 transoms, 26 feet long and 1 foot 8 inches in depth, which, over the pier, are covered by  $\frac{3}{8}$  inch plating, the rest of the floor being formed of bars 8 inches by  $\frac{5}{8}$  inch, with openings of 1 inch.

The girders and flooring of the fixed span are of the same form as those of the swing portion. The total weight of wrought iron in both swing and fixed spans collectively is 401 tons.

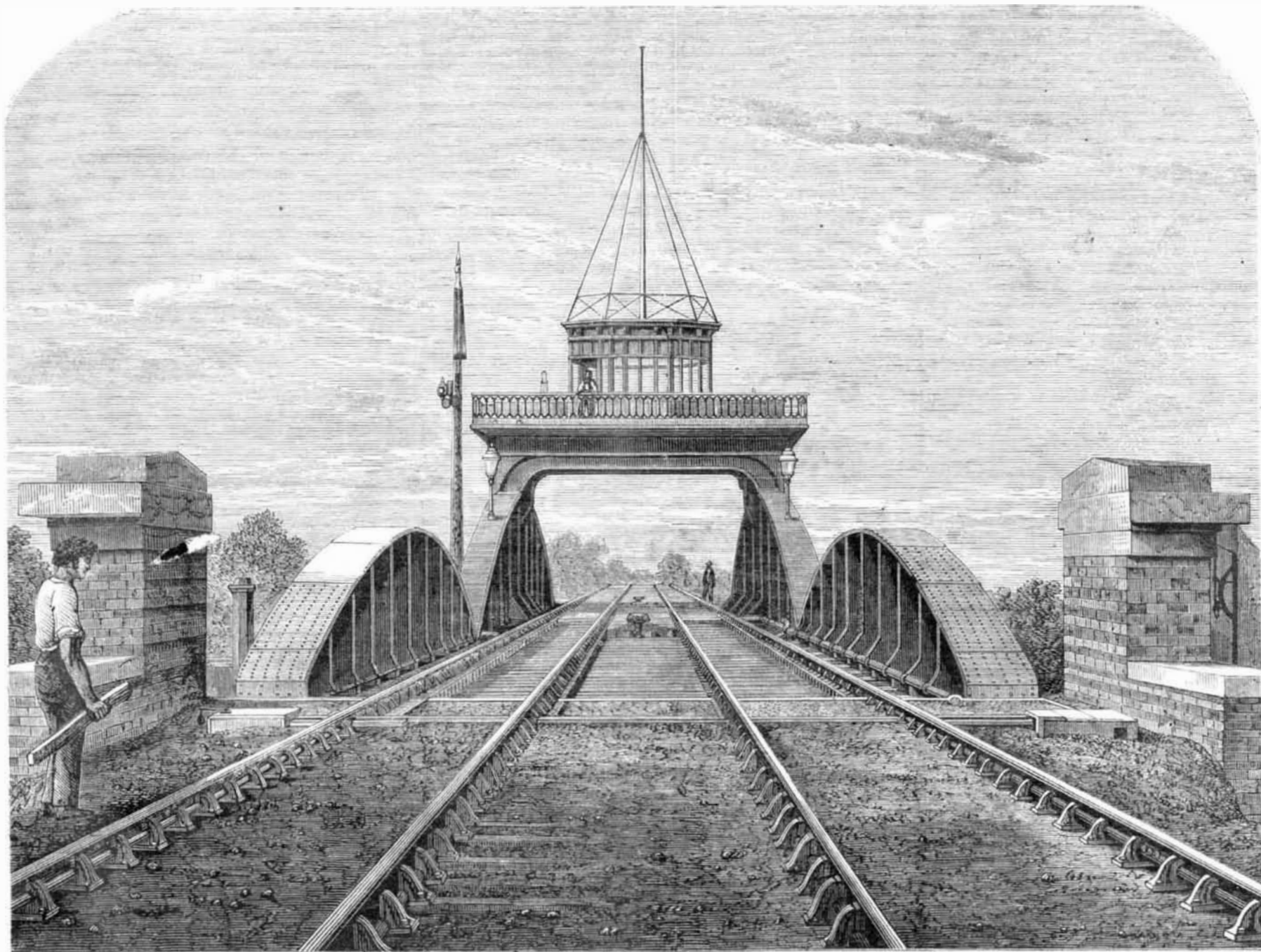
The swing portion is moved by means of hydraulic machinery giving motion to a pinion geared into a circular rack.

The superstructure of the bridge was designed by Mr. J. E. Harrison, and erected by Messrs. Pease, Hutchinson & Co., of Darlington, the hydraulic machinery being devised and applied by Sir William Armstrong & Co., of Newcastle on Tyne

## California's Growing Industries.

A correspondent of the *New York Times*, writing from California, states that the mining interests continue prosperous, and most of the leading mines are doing well, taking out a good quality of ore, and paying dividends. Many of the lesser ones, however, continue to levy assessments (Irish dividends); but that must necessarily be the case where no working capital is set aside for the purpose of carrying on the work of development. "It takes a mind to work a mine" is amply illustrated; but it is the history of nearly all the present dividend-paying mines. They all had to travel the old beaten tract, and occasionally relapse into their former condition. It is expecting a good deal of a mine to continue paying for an endless period of time, when we consider the fearful drain upon it to produce daily from 100 to 500 tons of ore. It cannot be expected, you know. Take the Crown Point and Belcher, for instance. These two mines have produced, on an average, five hundred tons daily for several years. A tun of ore is six cubic feet, and a hundred tons makes a big hole. They have taken out forty-six millions of dollars in the last four years, and are now down in the bowels of the earth some sixteen hundred feet. If anything were wanted to prove the theory that the center of the earth is a mass of seething molten matter, the intense heat in the lower levels of some of our deep mines would be conclusive evidence. In the lower galleries of the Ophir, for instance, before the recent air shafts were completed, the heat was so intense that the shifts of men had to be changed every two hours. (When I say "shifts," I speak in mining parlance.) Occasionally they got a gush of hot water that made things lively for them. After all the fuss about the great value of our agricultural products being superior to the mining interests, the grain production has only exceeded that of mining some four millions. In the earlier days we never dreamed that California would prove an agricultural country, and we relied only upon mining; but the two interests together are pretty good. It would be difficult to name a country, with

the same population, producing its equal in value—ninety-six millions in four years, that we have a record of, to say nothing of the large aggregate of the Chinese product, and that of individuals, of which we have no record, at least four millions more—say one hundred millions in total, or an average of two millions a month, and constantly increasing. California is not such a bad country after all. Wait about five years, and you will see its product doubled. Another evidence of our prosperity is the constantly increasing manufactures. We shall soon be able to supply nearly everything we require, thereby retaining in the country the money that we have heretofore sent abroad. Conspicuous among the recent enterprises, I can mention the establishing of jute bag factories, more woolen mills, and a watch manufactory. The Cornell Watch Company, of Chicago, has been transferred to this place, and will soon be in operation—the advantages being an even temperature and Chinese labor. The Chinese are probably the most intelligent and skillful people for any such purpose that can be found; quick to learn, always reliable in their work, doing a thing always alike, never striking for higher wages, never going on a spree, quiet and tractable; and they are particularly skillful where nice manipulation is required. The Watch Company will employ about 150 men, and the advantages of cheap labor will be manifest over Eastern labor in these particulars, to say nothing of the difference in price. The company were paying on an average \$3.25 per day, while they will be able to obtain better operatives here at \$1.25—a saving of \$2 per day, less the difference between gold and currency—not much, either, when we take into consideration that their receipts will be in coin. The company will find a large outlet for their cheap watches in China and Japan, the natives of those countries being much addicted to purchasing timepieces. Every Chinaman purchases a watch. They want to know about what time they may expect to be pelted with brickbats and mud balls by the enterprising young Americans, who are inculcated at an early age in this entertaining sport.



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